



**McKEE & ASSOCIATES**  
ARCHITECTS, INC.

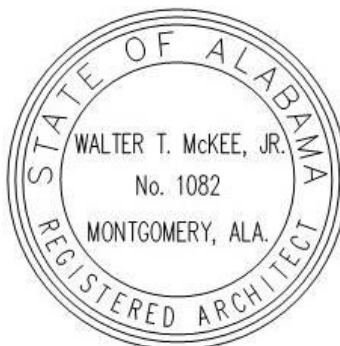
# Project Manual



## Additions to Elberta High School for the Baldwin County Board of Education Bay Minette, Alabama

Project No: **23.192**  
September 12, 2023

Alabama Division of Construction Management No.



# TABLE OF CONTENTS

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## Additions to Elberta High School for the Baldwin County Board of Education Bay Minette, Alabama

**MCKEE PROJECT NO. 23.192**

### **BIDDING REQUIREMENTS**

- Advertisement For Bids
- Request For Information (McKee Form)
- Prior Approval/Substitution Request Form (McKee Form)
- Proposal Form (DCM Form C-3, August 2021)
- Accounting of Sales Tax (DCM Form C-3A, August 2021), Attachment to DCM Form C-3
- Form Of Bid Bond (DCM Form C-4, August 2021)
- Instructions To Bidders (DCM Form C-2, August 2021)
- Special Instructions To Bidders (McKee Form July 2020)

### **CONTRACT FORMS**

- Construction Contract (DCM Form C-5, August 2021)
- State of Alabama Department of Finance, Construction Management Division - Administrative Code 355-16-1 Collection of User Fees
- State of Alabama Department of Finance, Real Property Management, Division of Construction Management Permit Fee & Permit Re-Inspection Fee Calculation Worksheet (Revised August 2021)
- State Of Alabama Department of Revenue "Notice" regarding Tax Guidance for Contractors, Subcontractors and Alabama Governmental Entities Regarding Construction related contracts including Application for Sales and Use Tax Certificate of Exemption Form (Form ST:EXC-01 dated 8/18).
- State of Alabama Disclosure Statement Form, Required by Article 3B of Title 41, Code of Alabama 1975 (Revised 09/2013) with Information and Instructions regarding Relationships Between Contractor/Grantees and Public Officials/Employees.
- State of Alabama E-Verify Memorandum of Understanding Instructions (Revised August 2021) *with* ABC Bulletin (May 29, 2012) *and* Revised Alabama Immigration Law Guidance for School Boards (Revised May 2012).
- Act 2009-657 Requiring Certification Of Fire Alarm Contractors (ABC Memorandum January 19, 2021)
- State Of Alabama Department Of Insurance – Application For State Fire Marshal’s Certified Fire Alarm Contractor Permit
- Performance Bond (DCM Form C-6, August 2021)
- Payment Bond (ABC Form C-7, August 2021)

## **GENERAL CONDITIONS**

- General Conditions of the Contract (DCM Form C-8, Revised October 2022)
- Instructions for Contractor's Insurance Company (Article 37 of DCM Form C-8, Revised October 2022)
- Supplement to General Conditions of the Contract (McKee Form August 2020)
- Application and Certificate for Payment (DCM Form C-10, Revised July 2022)
- Schedule Of Values, (DCM Form C-10SOV, Revised October 2021) Attachment to DCM Form C-10
- Inventory Of Stored Materials, (DCM Form C-10SM, Revised October 2021) Attachment to DCM Form C-10
- Pre-Construction Conference Checklist (DCM Form B-8, Revised November 2022)
- Progress Schedule and Report (DCM Form C-11, August 2021)
- Project Data Form (DCM Form B-9, August 2021)
- Statement Of Field Observations (DCM Form B-10, August 2021)
- Change Order Checklist, (DCM Form B-12, August 2021) For Use With DCM Form C-12
- Contract Change Order (DCM Form C-12 (fully locally-funded K-12 Schools), August 2021)
- Change Order Justification (DCM Form B-11, August 2021) Attachment to DCM Form C-12
- Final Payment Checklist (DCM Form B-13, Revised October 2022)
- Certificate of Substantial Completion (DCM Form C-13, Revised November 2022)
- Form of Advertisement for Completion (DCM Form C-14, August 2021)
- Contractor's Affidavit of Payment of Debts and Claims (DCM Form C-18, August 2021)
- Contractor's Affidavit of Release of Liens (DCM Form C-19, August 2021)
- Consent of Surety to Final Payment (DCM Form C-20, August 2021)
- Detail Of Project Sign (DCM Form C-15, Revised December 2021)
- Detail Of Plaque (ABC Form C-16, August 2001)
- Certificate of Asbestos Free Building Materials (McKee Form)

## **TECHNICAL SPECIFICATIONS**

### **DIVISION 01      GENERAL REQUIREMENTS**

01010	Scope of Work
01011	Contingency Allowances
01250	Contract Modification Procedures
01290	Payment Procedures
01320	Construction Progress Documentation
01322	Photographic Documentation
01330	Submittal Requirements
01500	Temporary Facilities and Controls
01600	Product Requirements
01700	Execution Requirements

01770	Closeout Procedures
01781	Project Record Documents
01782	Operation and Maintenance Data
01820	Demonstration and Training

**DIVISION 02 SITE WORK**

02070	Selective Demolition
02100	Site Preparation
02200	Earthwork
02282	Termite Control
02512	Asphalt Pavement Seal Coating
02535	Synthetic Track Surface
02660	Water Distribution System
02720	Storm Sewers
02730	Sanitary Sewers
02789	Synthetic Turf and Drainage Field (Batting Cages)
02790	Synthetic Turf and Drainage Field
02810	Sodding and Topsoil
02811	Seeding and Topsoil
02831	Vinyl Coated Chain Link Fencing & Gates
02900	Irrigation System

**DIVISION 03 CONCRETE**

03310	Cast-In-Place Concrete
03368	UV Floor System (Sealed Concrete)

**DIVISION 04 MASONRY**

04200	Unit Masonry
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**DIVISION 05 METAL**

05500	Miscellaneous Steel and Metal Fabrications
05540	Metal Studs

**DIVISION 06 CARPENTRY**

06100	Rough Carpentry
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**DIVISION 07 MOISTURE PROTECTION**

07115	Bituminous Dampproofing
07200	Insulation



07410	Preformed Metal Roofing
07411	Metal Wall Panels
07600	Flashing and Sheet Metal
07900	Joint Sealers

## **DIVISION 08 DOORS, WINDOWS AND GLASS**

08001	Impact and Wind Resistant Aluminum Storefront Systems
08100	Steel Doors and Frames
08211	Wood Doors
08220	Fiberglass Reinforced Plastic (FRP) Doors
08330	Coiling Doors
08700	Finish Hardware
08800	Glazing

## **DIVISION 09 FINISHES**

09510	Acoustical Ceilings
09650	Rubber Base
09672	Resinous Flooring
09900	Painting

## **DIVISION 10 SPECIALTIES**

10160	Toilet Partitions
10200	Louvers
10410	Identifying Devices
10440	Fire Extinguishers, Cabinets and Accessories
10531	Aluminum Hanger Rod Canopy
10800	Toilet Accessories

## **DIVISION 11 EQUIPMENT**

11000	Goalposts and Accessories
11200	Gymnasium Equipment
11201	Batting Cages (Indoor)

## **DIVISION 12 FURNISHINGS**

**NOT APPLICABLE**

## **DIVISION 13 SPECIAL CONSTRUCTION**

13120	Pre-Engineered Metal Building
13342	Bleacher Systems and Press Box

**DIVISION 14    CONVEYING SYSTEM**

**NOT APPLICABLE**

**DIVISION 15    MECHANICAL**

15100	General Mechanical Provisions
15200	Testing and Balancing Air Distribution Systems
15400	Plumbing
15800	Heating, Ventilating and Air Conditioning
15900	Automatic Temperature Control System
15950	EMS & DDC
15995	Commissioning of HVAC Systems

**DIVISION 16    ELECTRICAL**

16100	Electrical
16200	Surge Suppressor
16300	Low Voltage Dry Transformers
16720	Fire Detection and Alarm Systems
16730	Clock System
16820	Intercom-Sound
16950	Communications

**END OF TABLE OF CONTENTS**

## ADVERTISEMENT FOR BIDS

### ADDITIONS TO ELBERTA HIGH SCHOOL FOR THE BALDWIN COUNTY BOARD OF EDUCATION BAY MINETTE, ALABAMA

#### MCKEE PROJECT NO. 23-192

**Requirements for Pre-qualification:** All potential bidders shall contact the Architect at [mckeeplans@gmail.com](mailto:mckeeplans@gmail.com) to receive the criteria to be used for the pre-qualification of this project (AIA Document A305 and Questionnaire).

**Pre-qualification proposals** will be received at the office of McKee and Associates Architects, 631 South Hull Street, Montgomery, AL 36104 until **2:00 P.M. Central Time, Thursday, October 26, 2023.** Forms should be emailed to [mckeeplans@gmail.com](mailto:mckeeplans@gmail.com).

**A Non-Mandatory Pre-Bid walk through** shall occur at **10:00 AM, Central Time, on Thursday, November 2, 2023;** meet at the main office of the school.

Sealed proposals for this project shall be received by Mrs. Marlana Hanner, Purchasing Supervisor, Baldwin County Board of Education, 23651 Flowers Road, Robertsedale, AL 36567 | 251-947-8403, **until 2:00 PM Central Time, Thursday November 9, 2023,** then opened and read aloud.

All General Contractors bidding on this project shall be required to visit the site and examine all existing conditions prior to submitting their proposal. All Bidders shall have general liability and workman's compensation insurance.

The project shall be bid excluding taxes. Bids must be submitted on proposal forms furnished by the Architect or copies thereof. No bid may be withdrawn after scheduled closing for receipt of bids for a period of ninety (90) days. The Owner reserves the right to reject any or all proposals and to waive technical errors if, in the Owners judgment, the best interests of the Owner will thereby be promoted.

A certified check or Bid Bond payable to **Baldwin County Board of Education** in an amount not less than five percent (5%) of the amount of the bid, but in no event more than \$10,000.00 must accompany the bidder's sealed proposal. Performance and statutory labor and material payment bonds will be required at the signing of the Contract.

All bidders bidding in amounts exceeding that established by the State Licensing Board for General Contractors must be licensed under the provisions of Title 34, Chapter 8, Code of Alabama, 1975, and must show evidence of license before bidding or bid will not be received or considered by the Architect. All bidders shall show such evidence by clearly displaying their current license number on the outside of their sealed envelope in which the proposal is delivered.

PDFs of the project can be reviewed by going to the McKee website @ [www.mckeeassoc.com](http://www.mckeeassoc.com) and selecting "Project Bid List". Also, if you are not receiving NOTIFICATIONS from us, please register on our website, "Project Bid List" by selecting manage your bid list profile. The documents may be viewed on-line and printed by General Contractors, Sub-Contractors and Suppliers. Documents published through this procedure are the only documents endorsed by the Architect. The Architect is unable to monitor, confirm and maintain other websites that provide documents. Addendums will be provided to entities that have **CONFIRMED** bidding for this particular project. The Architect retains ownership and copyrights of the documents. If bidders require printed sets, please submit request to the Architect at [mckeeplans@gmail.com](mailto:mckeeplans@gmail.com). Include your first & last name, comp

any name, address, phone number and the McKee project name and number. *Print sets are to be returned in re-usable condition within ten days after bid opening.*

All RFIs and RFAs regarding the bid documents shall be sent and addressed through emails found on the RFI and RFA forms in the project manual. **NOTE: ONLY THE RFI AND RFA FORMS IN THE PROJECT MANUAL WILL BE ACCEPTED.** The Architect will not accept inquiries via telephone or fax.

Completion Time: See scope of work in Project Manual.

Supervision: Contractor to ensure proper supervision of all work.

**Owner:** Mr. Carl E. Tyler, Superintendent, Baldwin County Board of Education; 2600-A North Hand Avenue, Bay Minette, Alabama 36507, Phone: (251) 937-0306

**Architect:** McKee and Associates Architects, Inc., 631 South Hull Street, Montgomery, Alabama 36104, Phone: 334.834.9933

# REQUEST FOR INFORMATION

**(RFI)**

**Email this form in its entirety to Project Manager listed below.**

The Architect reserves the right not to answer any Request For Information received after **2:00 p.m., Two (2) days prior to the bid date.**

To: McKee & Associates, Architects  
Lisa Bowen, Project Manager  
[bidrfi@mckeeassoc.com](mailto:bidrfi@mckeeassoc.com)  
*Email*

From: \_\_\_\_\_  
*Name*  
\_\_\_\_\_  
*Company*  
\_\_\_\_\_  
*Email*

Project: \_\_\_\_\_

Project Number: \_\_\_\_\_

Request For Information Number: \_\_\_\_\_

Issue Date: \_\_\_\_\_

☐ BID PHASE

☐ CONSTRUCTION PHASE

## Procedures for “Explanations and Interpretations”:

- a. Should any bidder observe any ambiguity, discrepancy, omission, or error in the drawings and specifications, or in any other bid document, or be in doubt as to the intention and meaning of these documents, the bidder should immediately report such to the Architect and request clarification.
- b. **Clarification will be made only by written Addenda sent to all prospective bidders or can be accessed by going to the McKee web site - [mckeeassoc.com](http://mckeeassoc.com) and clicking on the tab “Files” to retrieve the Addendums.** Neither the Architect nor the Owner will be responsible in any manner for verbal answers or instructions regarding intent or meaning of the Bid Documents.
- c. **In the case of inconsistency between drawings and specifications or within either document, a bidder will be deemed to have included in its bid the better quality or greater quantity of the work involved unless the bidder asked for and obtained the Architect’s written clarification of the requirements before submission of a bid.**

**REQUEST FOR INFORMATION DESCRIPTION:** *(Fully describe the question or type of information requested.)*

**REFERENCES/ATTACHEMENTS:** *(List specific documents researched when seeking the information requested.)*

Specification Title: \_\_\_\_\_ Description: \_\_\_\_\_  
Section: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

Drawing Sheet Number: \_\_\_\_\_ Title: \_\_\_\_\_  
Plan: \_\_\_\_\_ Elevation: \_\_\_\_\_ Section: \_\_\_\_\_ Detail: \_\_\_\_\_

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

REQUEST FOR INFORMATION (RFI)  
0000- 1

Other:

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**RECEIVERS REPLY:**

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_ Copies to: \_\_\_\_\_

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Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

REQUEST FOR INFORMATION (RFI)  
0000- 2

MCKEE PROJECT NO. 23.192

# REQUEST FOR APPROVAL (RFA)

## PRIOR APPROVAL/SUBSTITUTION REQUEST

Email this form in its entirety to Project Manager listed below.

All products, materials, systems, equipment and services requested for prior approval must be submitted to the architect for approval **no later than 2:00 p.m., Ten (10) days prior to the bid date.**

To: McKee & Associates, Architects Substitution Request Number: \_\_\_\_\_  
Lisa Bowen From: \_\_\_\_\_  
[bowenl@mckeeassoc.com](mailto:bowenl@mckeeassoc.com) Date: \_\_\_\_\_  
*Email*

Project: \_\_\_\_\_ A/E Project Number: \_\_\_\_\_

Re: \_\_\_\_\_ Contract For: \_\_\_\_\_

Specification Title: \_\_\_\_\_ Description: \_\_\_\_\_  
Section: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

### Procedures for "Substitutions" and "Pre-Bid Approval":

- a. The identification of any product, material, system, item of equipment, or service in the Bid Documents by reference to a trade name, manufacturer's name, model number, etc. (hereinafter referred to as "source"), is intended to establish a required standard of performance, design, and quality and is not intended to limit competition unless the provisions of paragraph "D" below apply.
- b. When the Bid Documents identify only one or two sources, or three or more sources followed by "or approved equal" or similar wording, the bidder's proposal may be based on a source not identified but considered by the bidder to be equal to the standard of performance, design and quality as specified; however, such substitutions must ultimately be approved by the Architect. If the bidder elects to bid on a substitution without "Pre-bid Approval" as described below, then it will be understood that proof of compliance with specified requirements is the exclusive responsibility of the bidder.
- c. When the Bid Documents identify three or more sources and the list of sources is not followed by "or approved equal" or similar wording, the bidder's proposal shall be based upon one of the identified sources, unless the bidder obtains "Pre-bid Approval" of another source as described below. Under these conditions it will be expressly understood that no product, material, system, item of equipment, or service that is not identified in the Bid Documents or granted "Pre-Bid Approval" will be incorporated into the Work unless such substitution is authorized and agreed upon through a Contract Change Order.
- d. If the Bid Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the bidder's proposal must be based upon the identified sole source.
- e. **Procedures for "Pre-Bid Approval".** If it is desired that a product, material, system, piece of equipment, or service from a source different from those sources identified in the Bid Documents be approved as an acceptable source, application for the approval of such source must reach the hands of the Architect **at least ten days prior to the date set for the opening of bids.** At the Architect's discretion, this ten day provision may be waived. **The application for approval of a proposed source must be accompanied by technical data which the applicant desires to submit in support of the application.** The Architect will give consideration to reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed source with previous users, evidence of reputation of the source for prompt delivery, evidence of reputation of the source for efficiency in servicing its products, or any other pertinent written information. **The application to the Architect for approval of a proposed source must be accompanied by a schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Bid Documents.**

**The burden of proof of the merit of the proposed substitution is upon the proposer. To be approved, a proposed source must also meet or exceed all express requirements of the Bid Documents.** Approval, if granted, shall not be effective until published by the Architect in an addendum to the Bid Documents.

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**The undersigned requests consideration of the following product substitution:**

Proposed Substitution: \_\_\_\_\_

Manufacturer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Trade Name: \_\_\_\_\_ Model No.: \_\_\_\_\_

**Supporting Data Attached:** ☐ Product Description ☐ Drawings ☐ Photographs ☐ Performance & Test Data ☐ Specifications

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

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**The Undersigned states and certifies the following: (Mark Boxes as Applicable)**

- ☐ Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.  
*or*  
☐ Proposed substitution differs from what is specified in the Bid Documents. Submitted Data clearly identifies all differences from what is specified in the Bid Documents.

- ☐ No changes will be required to the Contract Documents for the proper installation of the proposed product substitution.  
*or*  
☐ Changes will be required to the Contract Documents for the proper installation of the proposed product substitution. Submitted Data clearly identifies description of changes.

*and*

- ☐ Warranty will be furnished for proposed substitution ☐ Equal to or ☐ Superior to specified product.  
☐ Proposed substitution does not affect dimensions shown on the drawings and functional clearances.  
☐ No changes will be required to the building design, engineering design or detailing by the proposed substitution.  
☐ Proposed substitution will have no adverse effect on other trades and will not affect or delay construction progress schedule.  
☐ No maintenance is required by the proposed substitution other than that required for originally specified product.  
☐ Other Information:

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**The undersigned further states that they have read the corresponding specification sections in the project manual and confirms that the function, appearance and quality of the proposed substitution are equivalent to or superior to the originally specified product.**

Submitted by: (Print)

Signature:

Date:

Firm:

Address:

Email:

Telephone:

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**A/E REVIEW AND ACTION**

- ☐ Substitution Approved ☐ Substitution Approved as noted ☐ Substitution Rejected  
☐ Substitution Request Received to Late

Comments:

Signed by:

Date:

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

PRIOR APPROVAL / SUBSTITUTION REQUEST FORM  
0000-2

MCKEE PROJECT NO. 23.192



# PROPOSAL FORM

To: \_\_\_\_\_ Date: \_\_\_\_\_  
(Awarding Authority)

In compliance with the Advertisement for Bids and subject to all the conditions thereof, the undersigned

\_\_\_\_\_  
(Legal Name of Bidder)

hereby proposes to furnish all labor and materials and perform all work required for the construction of  
**WORK** \_\_\_\_\_

in accordance with Drawings and Specifications, dated \_\_\_\_\_, prepared by  
\_\_\_\_\_, Architect/Engineer.

The Bidder, which is organized and existing under the laws of the State of \_\_\_\_\_,  
having its principal offices in the City of \_\_\_\_\_,  
is: ☐ a Corporation ☐ a Partnership ☐ an Individual (other) \_\_\_\_\_.

**LISTING OF PARTNERS OR OFFICERS:** If Bidder is a Partnership, list all partners and their  
addresses; if Bidder is a Corporation, list the names, titles, and business addresses of its officers:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**BIDDER'S REPRESENTATION:** The Bidder declares that it has examined the site of the Work,  
having become fully informed regarding all pertinent conditions, and that it has examined the Drawings  
and Specifications (including all Addenda received) for the Work and the other Bid and Contract  
Documents relative thereto, and that it has satisfied itself relative to the Work to be performed.

**ADDENDA:** The Bidder acknowledges receipt of Addenda Nos. \_\_\_\_\_ through \_\_\_\_\_ inclusively.

**BASE BID:** For construction complete as shown and specified, the sum of \_\_\_\_\_  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
(Including Any Unit Prices Attached)

**ALTERNATES:** If alternates as set forth in the Bid Documents are accepted, the following adjustments  
are to be made to the Base Bid:

For Alternate No. 1 ( ..... ) (add) (deduct) \$ \_\_\_\_\_  
(Insert key word for Alternate)

For Alternate No. 2 ( ..... ) (add) (deduct) \$ \_\_\_\_\_

For Alternate No. 3 ( ..... ) (add) (deduct) \$ \_\_\_\_\_

For Alternate No. 4 ( ..... ) (add) (deduct) \$ \_\_\_\_\_

For Alternate No. 5 ( ..... ) (add) (deduct) \$ \_\_\_\_\_

For Alternate No. 6 ( ..... ) (add) (deduct) \$ \_\_\_\_\_

**UNIT PRICES** - (Attach to this Proposal Form the unit prices, if any, on a separate sheet.)

**BID SECURITY:** The undersigned agrees to enter into a Construction Contract and furnish the prescribed Performance and Payment Bonds and evidence of insurance within fifteen calendar days, or such other period stated in the Bid Documents, after the contract forms have been presented for signature, provided such presentation is made within 30 calendar days after the opening of bids, or such other period stated in the Bid Documents. As security for this condition, the undersigned further agrees that the funds represented by the Bid Bond (or cashier's check) attached hereto may be called and paid into the account of the Awarding Authority as liquidated damages for failure to so comply.

Attached hereto is a: *(Mark the appropriate box and provide the applicable information.)*

☐ Bid Bond, executed by \_\_\_\_\_ as Surety,  
☐ a cashier's check on the \_\_\_\_\_ Bank of \_\_\_\_\_,  
for the sum of \_\_\_\_\_  
Dollars (\$ \_\_\_\_\_) made payable to the Awarding Authority.

**BIDDER'S ALABAMA LICENSE:**

State License for General Contracting: \_\_\_\_\_  
License Number Bid Limit Type(s) of Work

**CERTIFICATIONS:** The undersigned certifies that he or she is authorized to execute contracts on behalf of the Bidder as legally named, that this proposal is submitted in good faith without fraud or collusion with any other bidder, that the information indicated in this document is true and complete, and that the bid is made in full accord with State law. Notice of acceptance may be sent to the undersigned at the address set forth below.

The Bidder also declares that a list of all proposed major subcontractors and suppliers will be submitted at a time subsequent to the receipt of bids as established by the Architect in the Bid Documents but in no event shall this time exceed twenty-four (24) hours after receipt of bids.

**Legal Name of Bidder** \_\_\_\_\_

**Mailing Address** \_\_\_\_\_

**\* By (Legal Signature)** \_\_\_\_\_

**\* Name & Title (print)** \_\_\_\_\_ (Seal)

**Telephone Number** \_\_\_\_\_

**Email Address** \_\_\_\_\_

\* If other than the individual proprietor, or an above named member of the Partnership, or the above named president, vice-president, or secretary of the Corporation, attach written authority to bind the Bidder. Any modification to a bid shall be over the initials of the person signing the bid, or of an authorized representative.

Note: A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with DCM Form C-3: Proposal Form. Submission of DCM Form C-3A is required, it is not optional. A proposal shall be rendered non-responsive if an Accounting of Sales Tax is not provided.

**CONTRACTOR COMPLETION TIME FORM**

This Form **MUST** be submitted with the sealed Proposal.

**Additions**  
to  
**Elberta High School**  
for the  
**Baldwin County Board of Education**  
Bay Minette, Alabama

**MCKEE PROJECT NO. 23.192**

**Legal Name of Bidder**

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**Mailing Address**

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Per Section 01010, Scope of Work, the General Contractor **MUST** state his/her completion time on their Bid Proposal Form. The Contractor's Completion Time will be taken into consideration for award of the construction contract.

**The General Contractor MUST use this Completion Time Form to state his/her completion time.** This Form **MUST** be submitted with the sealed Proposal.

**COMPLETION TIME:**

All work shall be completed in **Calendar days** from Notice to Proceed issued by the Architect.

**Legal Signature of Bidder**

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**UNIT PRICE ITEM LEGEND**

**Additions**  
to  
**Elberta High School**  
for the  
**Baldwin County Board of Education**  
Bay Minette, Alabama

**MCKEE PROJECT NO. 23.192**

**Legal Name of Bidder** \_\_\_\_\_

**Mailing Address** \_\_\_\_\_

The General Contractor shall include the Unit Prices below in their Base Bid Proposal. **The quantities assigned below are above and beyond the amounts required to complete the work required by the bid documents.** This Unit Price Item Legend shall be submitted with the sealed Proposal.

**SCHEDULE OF UNIT PRICES:**

**UNIT PRICES:** The Unit Prices below establishes Unit Prices so that the Owner can delete/add quantities from the Contract(s) required.

**UNIT PRICE #1:** The Contractor shall include in his Base Bid proposal the cost for **an Additional 600** Cubic Yards Measured In Place (CYMIP) of removal and off-site disposal of unsuitable soil and furnishing, placing and compacting of acceptable fill material from below the finished subgrade and tested to meet requirements specified for the affected area, in accordance with the Geotechnical Report and Section 02200 "Earthwork."

**600 CYMIP @ \_\_\_\_\_/CYMIP = \$\_\_\_\_\_ Included in Base Bid**

**UNIT PRICE #2:** The Contractor shall include in his Base Bid proposal **50** Cubic Yards Measured In Place (CYMIP) for excavation of unsuitable soils, disposal off site of excavated material and furnishing and installation of lean concrete mud footing "mud sill" in accordance with the Geotechnical Report and Section 02200 "Earthwork."

**50 CYMIP @ \_\_\_\_\_ per CYMIP = \$\_\_\_\_\_ Included in Base Bid**

Note: This unit price is not applicable to cost of mud footings that are required due to over-excavation, or due to not pouring footings the same date they are excavated, or other reasons indicated in Section 02200 - "Earthwork," or Section 03310 - "Concrete."

## ACCOUNTING OF SALES TAX

### Attachment to DCM Form C-3: Proposal Form

To: \_\_\_\_\_ Date: \_\_\_\_\_  
(Awarding Authority)

NAME OF PROJECT \_\_\_\_\_

#### SALES TAX ACCOUNTING

Pursuant to Act 2013-205, Section 1(g) the Contractor accounts for the sales tax NOT included in the bid proposal form as follows:

#### ESTIMATED SALES TAX AMOUNT

BASE BID: \$ \_\_\_\_\_

Alternate No. 1 (.....) (add) (deduct) \$ \_\_\_\_\_  
(Insert key word for Alternate)

Alternate No. 2 (.....) (add) (deduct) \$ \_\_\_\_\_

Alternate No. 3 (.....) (add) (deduct) \$ \_\_\_\_\_

Alternate No. 4 (.....) (add) (deduct) \$ \_\_\_\_\_

Alternate No. 5 (.....) (add) (deduct) \$ \_\_\_\_\_

Alternate No. 6 (.....) (add) (deduct) \$ \_\_\_\_\_

**Failure to provide an accounting of sales tax shall render the bid non-responsive. Other than determining responsiveness, sales tax accounting shall not affect the bid pricing nor be considered in the determination of the lowest responsible and responsive bidder.**

Legal Name of Bidder \_\_\_\_\_

Mailing Address \_\_\_\_\_

\*By (Legal Signature) \_\_\_\_\_

\*Name (type or print) \_\_\_\_\_ (Seal)

\*Title \_\_\_\_\_

Telephone Number \_\_\_\_\_

Email Address \_\_\_\_\_

Note: A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with DCM Form C-3: Proposal Form. Submission of DCM Form C-3A with DCM Form C-3 is required, it is not optional. A proposal shall be rendered non-responsive if an Accounting of Sales Tax is not provided.

# BID BOND

The **PRINCIPAL** (*Bidder's company name and address*)

Name:

Address:

The **SURETY** (*Company name and primary place of business*)

Name:

Address:

The **OWNER** (*Entity name and address*)

Name:

Address:

The **PROJECT** for which the Principal's Bid is submitted: (*Project name as it appears in the Bid Documents*)

**KNOW ALL MEN BY THESE PRESENTS**, that we, the undersigned Principal and Surety, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the **PENAL SUM of five percent (5%) of the amount of the Principal's bid, but in no event more than Ten-thousand Dollars (\$10,000.00).**

**THE CONDITION OF THIS OBLIGATION** is that the Principal has submitted to the Owner the attached bid, which is incorporated herein by reference, for the Project identified above.

**NOW, THEREFORE**, if, within the terms of the Bid Documents, the Owner accepts the Principal's bid and the Principal thereafter either:

- (a) executes and delivers a Construction Contract with the required Performance and Payment Bonds (each in the form contained in the Bid Documents and properly completed in accordance with the bid) and delivers evidence of insurance as prescribed in the Bid Documents, or
  - (b) fails to execute and deliver such Construction Contract with such Bonds and evidence of insurance, but pays the Owner the difference, not to exceed the Penal Sum of this Bond, between the amount of the Principal's Bid and the larger amount for which the Owner may award a Construction Contract for the same Work to another bidder,
- then**, this obligation shall be null and void, otherwise it shall remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that the obligation of the Surety under this Bond shall not in any manner be impaired or affected by any extension of the time within which the Owner may accept the Principal's bid, and the Surety does hereby waive notice of any such extension.

**SIGNED AND SEALED** this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

ATTEST:

**PRINCIPAL:**

\_\_\_\_\_

By \_\_\_\_\_

\_\_\_\_\_  
Name and Title

**SURETY:**

ATTEST:

\_\_\_\_\_

By \_\_\_\_\_

\_\_\_\_\_  
Name and Title

Note: Do not staple this form; use clips. Purpose: quickly and efficiently scan thousands of documents into DCM's database.

# INSTRUCTIONS TO BIDDERS

## CONTENTS

- |   |   |
|---|---|
| 1. <u>Bid Documents</u>   | 9. <u>Withdrawal or Revision of Bids</u>                              |
| 2. <u>General Contractor's</u><br><u>State Licensing Requirements</u>         | 10. <u>Opening of Bids</u>  |
| 3. <u>Qualifications of Bidders</u><br><u>and Prequalification Procedures</u> | 11. <u>Incomplete and Irregular Bids</u>                              |
| 4. <u>Preference to Resident Contractors</u>                                  | 12. <u>Bid Errors</u>   |
| 5. <u>Examination of Bid Documents and</u><br><u>the Site of the Work</u>     | 13. <u>Disqualification of Bidders</u>                                |
| 6. <u>Explanations and Interpretations</u>                                    | 14. <u>Consideration of Bids</u>                                      |
| 7. <u>Substitutions</u>   | 15. <u>Determination of Low Bidder by</u><br><u>Use of Alternates</u> |
| 8. <u>Preparation and Delivery of Bids</u>                                    | 16. <u>Unit Prices</u>  |
|   | 17. <u>Award of Contract</u>  |

### 1. BID DOCUMENTS:

The Bid Documents consist of the Advertisement for Bids, these Instructions to Bidders, any supplements to these Instructions to Bidders, the Proposal Form and the Accounting of Sales Tax, and the proposed Contract Documents. The proposed Contract Documents consist of the Construction Contract, the Performance Bond and Payment Bond, the Conditions of the Contract (General, Supplemental, and other Conditions), Drawings, Specifications and all addenda issued prior to execution of the Construction Contract. Bid Documents may be obtained or examined as set forth in the Advertisement for Bids.

### 2. GENERAL CONTRACTOR'S STATE LICENSING REQUIREMENTS:

When the amount bid for a contract exceeds \$50,000, the bidder must be licensed by the State Licensing Board for General Contractors and must show the Architect evidence of license before bidding or the bid will not be received by the Architect or considered by the Awarding Authority. A bid exceeding the bid limit stipulated in the bidder's license, or which is for work outside of the type or types of work stipulated in the bidder's license, will not be considered. In case of a joint venture of two or more contractors, the amount of the bid shall be within the maximum bid limitation as set by the State Licensing Board for General Contractors of the combined limitations of the partners to the joint venture.

### 3. QUALIFICATIONS of BIDDERS and PREQUALIFICATION PROCEDURES:

a. Any special qualifications required of general contractors, subcontractors, material suppliers, or fabricators are set forth in the Bid Documents.

b. The Awarding Authority may have elected to prequalify bidders. Parties interested in bidding for this contract are directed to the Advertisement for Bids and Supplemental Instructions to Bidders to determine whether bidders must be prequalified and how they may obtain copies of the Awarding Authority's published prequalification procedures and criteria.

c. Release of Bid Documents by the Architect to a prospective bidder will not constitute any determination by the Awarding Authority or Architect that the bidder has been found to be qualified, prequalified, or responsible.

**4. PREFERENCE to RESIDENT CONTRACTORS:**

(If this project is federally funded in whole or in part, this Article shall not apply.)

a. In awarding the Contract, preference will be given to Alabama resident contractors and a nonresident bidder domiciled in a state having laws granting preference to local contractors shall be awarded the Contract only on the same basis as the nonresident bidder's state awards contracts to Alabama contractors bidding under similar circumstances.

b. A nonresident bidder is a contractor which is neither organized and existing under the laws of the State of Alabama, nor maintains its principal place of business in the State of Alabama. A nonresident contractor which has maintained a permanent office within the State of Alabama for at least five continuous years shall not thereafter be deemed to be a non-resident contractor so long as the contractor continues to maintain a branch office within Alabama.

**5. EXAMINATION of BID DOCUMENTS and the SITE of the WORK:**

Before submitting a bid for the Work, the bidders shall carefully examine the Bid Documents, visit the site, and satisfy themselves as to the nature and location of the Work, and the general and local conditions, including weather, the general character of the site or building, the character and extent of existing work within or adjacent to the site and any other work being performed thereon at the time of submission of their bids. They shall obtain full knowledge as to transportation, disposal, handling, and storage of materials, availability of water, electric power, and all other facilities in the area which will have a bearing on the performance of the Work for which they submit their bids. The submission of a bid shall constitute a representation by the bidder that the bidder has made such examination and visit and has judged for and satisfied himself or herself as to conditions to be encountered regarding the character, difficulties, quality, and quantities of work to be performed and the material and equipment to be furnished, and as to the contract requirements involved.

**6. EXPLANATIONS and INTERPRETATIONS:**

a. Should any bidder observe any ambiguity, discrepancy, omission, or error in the drawings and specifications, or in any other bid document, or be in doubt as to the intention and meaning of these documents, the bidder should immediately report such to the Architect and request clarification.

b. Clarification will be made only by written Addenda sent to all prospective bidders. Neither the Architect nor the Awarding Authority will be responsible in any manner for verbal answers or instructions regarding intent or meaning of the Bid Documents.

c. In the case of inconsistency between drawings and specifications or within either document, a bidder will be deemed to have included in its bid the better quality or greater quantity of the work involved unless the bidder asked for and obtained the Architect's written clarification of the requirements before submission of a bid.



## 7. SUBSTITUTIONS:

- a.** The identification of any product, material, system, item of equipment, or service in the Bid Documents by reference to a trade name, manufacturer's name, model number, etc. (hereinafter referred to as "source"), is intended to establish a required standard of performance, design, and quality and is not intended to limit competition unless the provisions of paragraph "d" below apply.
- b.** When the Bid Documents identify only one or two sources, or three or more sources followed by "or approved equal" or similar wording, the bidder's proposal may be based on a source not identified but considered by the bidder to be equal to the standard of performance, design and quality as specified; however, such substitutions must ultimately be approved by the Architect. If the bidder elects to bid on a substitution without "Pre-bid Approval" as described below, then it will be understood that proof of compliance with specified requirements is the exclusive responsibility of the bidder.
- c.** When the Bid Documents identify three or more sources and the list of sources is not followed by "or approved equal" or similar wording, the bidder's proposal shall be based upon one of the identified sources, unless the bidder obtains "Pre-bid Approval" of another source as described below. Under these conditions it will be expressly understood that no product, material, system, item of equipment, or service that is not identified in the Bid Documents or granted "Pre-Bid Approval" will be incorporated into the Work unless such substitution is authorized and agreed upon through a Contract Change Order.
- d.** If the Bid Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the bidder's proposal must be based upon the identified sole source.
- e. Procedures for "Pre-bid Approval".** If it is desired that a product, material, system, piece of equipment, or service from a source different from those sources identified in the Bid Documents be approved as an acceptable source, application for the approval of such source must reach the hands of the Architect at least ten days prior to the date set for the opening of bids. At the Architect's discretion, this ten day provision may be waived. The application for approval of a proposed source must be accompanied by technical data which the applicant desires to submit in support of the application. The Architect will give consideration to reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed source with previous users, evidence of reputation of the source for prompt delivery, evidence of reputation of the source for efficiency in servicing its products, or any other pertinent written information. The application to the Architect for approval of a proposed source must be accompanied by a schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Bid Documents. The burden of proof of the merit of the proposed substitution is upon the proposer. To be approved, a proposed source must also meet or exceed all express requirements of the Bid Documents. Approval, if granted, shall not be effective until published by the Architect in an addendum to the Bid Documents.

## 8. PREPARATION and DELIVERY of BIDS:

### a. DCM Form C-3: Proposal Form:

- (1) Bids must be submitted on the Proposal Form as contained in the Bid Documents; only one copy is required to be submitted. A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with the Proposal Form.
- (2) All information requested of the bidder on the Proposal Form must be filled in. The form must be completed by typewriter or hand-printed in ink.
- (3) Identification of Bidder: On the first page of the Proposal Form the bidder must be fully identified by completing the spaces provided for:
  - (a) the legal name of the bidder,
  - (b) the state under which laws the bidder's business is organized and existing,
  - (c) the city (and state) in which the bidder has its principal offices,
  - (d) the bidder's business organization, i.e., corporation, partnership, or individual (to be indicated by marking the applicable box and writing in the type of organization if it is not one of those listed), and
  - (e) the partners or officers of the bidder's organization, if the bidder is other than an individual. If the space provided on the Proposal Form is not adequate for this listing, the bidder may insert "See Attachment" in this space and provide the listing on an attachment to the Proposal Form.
- (4) Where indicated by the format of the Proposal Form, the bidder must specify lump sum prices in both words and figures. In case of discrepancy between the prices shown in words and in figures, the words will govern.
- (5) All bid items requested in the Proposal Form, including alternate bid prices and unit prices for separate items of the Work, must be bid. If a gross sum of bid items is requested in the Proposal Form, the gross sum shall be provided by the bidder.
- (6) In the space provided in the Proposal Form under "Bidder's Alabama License", the bidder must insert his or her current general contractor's state license number, current bid limit, and type(s) of work for which bidder is licensed.
- (7) The Proposal Form shall be properly signed by the bidder. If the bidder is:
  - (a) **an individual**, that individual or his or her "authorized representative" must sign the Proposal Form;
  - (b) **a partnership**, the Proposal Form must be signed by one of the partners or an "authorized representative" of the Partnership;
  - (c) **a corporation**, the president, vice-president, secretary, or "authorized representative" of the corporation shall sign and affix the corporate seal to the Proposal Form.

As used in these Instructions to Bidders, "authorized representative" is defined as a person to whom the bidder has granted written authority to conduct business in the bidder's behalf by signing and/or modifying the bid. Such written authority shall be signed by the bidder (the individual proprietor, or a member of the Partnership, or an officer of the Corporation) and shall be attached to the Proposal Form.

(8) Interlineation, alterations or erasures on the Proposal Form must be initialed by the bidder or its “authorized representative”.

**b. DCM Form C-3A: Accounting of Sales Tax**

A completed DCM Form C-3A: Accounting of Sales Tax must be submitted with DCM Form C-3: Proposal Form. Submission of DCM Form C-3A is required, it is not optional. A proposal shall be rendered non-responsive if an Accounting of Sales Tax is not provided.

**c. Bid Guaranty**

(1) The Proposal Form must be accompanied by a cashier’s check, drawn on an Alabama bank, or a Bid Bond, executed by a surety company duly authorized and qualified to make such bonds in the State of Alabama, payable to the Awarding Authority.

(2) If a Bid Bond is provided in lieu of a cashier’s check, the bond shall be on the Bid Bond form as stipulated in the Bid Documents.

(3) The amount of the cashier’s check or Bid Bond shall not be less than five percent of the contractor’s bid, but is not required to be in an amount more than ten thousand dollars.

**d. Delivery of Bids:**

(1) Bids will be received until the time set, and at the location designated, in the Advertisement for Bids unless notice is given of postponement. Any bid not received prior to the time set for opening bids will be rejected absent extenuating circumstances and such bids shall be rejected in all cases where received after other bids are opened.

(2) Each bid shall be placed, together with the bid guaranty, in a sealed envelope. On the outside of the envelope the bidder shall write in large letters “Proposal”, below which the bidder shall identify the Project and the Work bid on, the name of the bidder, and the bidder’s current general contractor’s state license number.

(3) Bids may be delivered in person, or by mail if ample time is allowed for delivery. When sent by mail, the sealed envelope containing the bid, marked as indicated above, shall be enclosed in another envelope for mailing.

**9. WITHDRAWAL or REVISION of BIDS:**

**a.** A bid may be withdrawn prior to the time set for opening of bids, provided a written request, executed by the bidder or the bidder’s “authorized representative”, is filed with the Architect prior to that time. The bid will then be returned to the bidder unopened.

**b.** A bid which has been sealed in its delivery envelope may be revised by writing the change in price on the outside of the delivery envelope over the signature of the bidder or the bidder’s “authorized representative”. In revising the bid in this manner, the bidder must only write the amount of the change in price on the envelope **and must not reveal the bid price.**

c. Written communications, signed by the bidder or its “authorized representative”, to revise bids will be accepted if received by the Architect prior to the time set for opening bids. The Architect will record the instructed revision upon opening the bid. Such written communication may be by facsimile if so stipulated in Supplemental Instructions to Bidders. In revising the bid in this manner, the bidder must only write the amount of the change in price **and must not reveal the bid price.**

d. Except as provided in Article 12 of these Instructions to Bidders, no bid shall be withdrawn, modified, or corrected after the time set for opening bids.

## **10. OPENING of BIDS:**

a. Bids will be opened and read publicly at the time and place indicated in the Advertisement for Bids. Bidders or their authorized representatives are invited to be present.

b. A list of all proposed major subcontractors and suppliers will be submitted by Bidders to the Architect at a time subsequent to the receipt of bids as established by the Architect in the Bid Documents but in no event shall this time exceed twenty-four (24) hours after receipt of bids. If the list includes a fire alarm contractor and/or fire sprinkler contractor, Bidders will also submit a copy of the fire alarm contractor’s and/or fire sprinkler contractor’s permits from the State of Alabama Fire Marshal’s Office.

## **11. INCOMPLETE and IRREGULAR BIDS:**

A bid that is not accompanied by data required by the Bid Documents, or a bid which is in any way incomplete, may be rejected. Any bid which contains any uninitialed alterations or erasures, or any bid which contains any additions, alternate bids, or conditions not called for, or any other irregularities of any kind, will be subject to rejection.

## **12. BID ERRORS:**

a. **Errors and Discrepancies in the Proposal Form.** In case of error in the extension of prices in bids, the unit price will govern. In case of discrepancy between the prices shown in the figures and in words, the words will govern.

b. **Mistakes within the Bid.** If the low bidder discovers a mistake in its bid, the low bidder may seek withdrawal of its bid without forfeiture of its bid guaranty under the following conditions:

(1) **Timely Notice:** The low bidder must notify the Awarding Authority and Architect in writing, within three working days after the opening of bids, that a mistake was made. This notice must be given within this time frame whether or not award has been made.

(2) **Substantial Mistake:** The mistake must be of such significance as to render the bid price substantially out of proportion to the other bid prices.

(3) **Type of Mistake:** The mistake must be due to calculation or clerical error, an inadvertent omission, or a typographical error which results in an erroneous sum. A mistake of law, judgment, or opinion shall not constitute a valid ground for withdrawal without forfeiture.

**(4) Documentary Evidence:** Clear and convincing documentary evidence of the mistake must be presented to the Awarding Authority and the Architect as soon as possible, but no later than three working days after the opening of bids.

The Awarding Authority's decision regarding a low bidder's request to withdraw its bid without penalty shall be made within 10 days after receipt of the bidder's evidence or by the next regular meeting of the Awarding Authority. Upon withdrawal of bid without penalty, the low bidder shall be prohibited from (1) doing work on the project as a subcontractor or in any other capacity and (2) bidding on the same project if it is re-bid.

### **13. DISQUALIFICATION of BIDDERS:**

Any bidder(s) may be disqualified from consideration for contract award for the following reasons:

**a. Collusion.** Any agreement or collusion among bidders or prospective bidders in restraint of freedom of competition to bid at a fixed price or to refrain from bidding or otherwise shall render the bids void and shall cause the bidders or prospective bidders participating in such agreement or collusion to be disqualified from submitting further bids to the Awarding Authority on future lettings. (See § 39-2-6, Code of Alabama 1975, for possible criminal sanctions.)

**b. Advance Disclosure.** Any disclosure in advance of the terms of a bid submitted in response to an Advertisement for Bids shall render the proceedings void and require re-advertisement and rebid.

**c. Failure to Settle Other Contracts.** The Awarding Authority may reject a bid from a bidder who has not paid, or satisfactorily settled, all bills due for labor and material on other contracts in force at the time of letting.

### **14. CONSIDERATION of BIDS:**

**a.** After the bids are opened and read publicly, the bid prices will be compared and the results of this comparison will be available to the public. Until the final award of the contract, however, the Awarding Authority shall have the right to reject any or all bids, and it shall have the right to waive technical errors and irregularities if, in its judgment, the bidder will not have obtained a competitive advantage and the best interests of the Awarding Authority will be promoted.

**b.** If the Bid Documents request bids for projects or parts of projects in combination or separately, the Bid Documents must include supplements to, these Instructions to Bidders setting forth applicable bid procedures. Award or awards will be made to the lowest responsible and responsive bidder or bidders in accordance with such bid procedures.

### **15. DETERMINATION of LOW BIDDER by USE of ALTERNATES:**

**a.** The Awarding Authority may request alternate bid prices (alternates) to facilitate either reducing the base bid to an amount within the funds available for the project or adding items to the base bid within the funds available for the project. Alternates, if any, are listed in the

Proposal Form in the order in which they shall cumulatively deduct from or add to the base bid for determining the lowest bidder.

**b.** If alternates are included in the Proposal Form, the Awarding Authority shall determine the dollar amount of funds available and immediately prior to the opening of bids shall announce publicly the funds available for the project. The dollar amount of such funds shall be used to determine the lowest bidder as provided herein below, notwithstanding that the actual funds available for the project may subsequently be determined to be more or less than the expected funds available as determined immediately prior to the time of the opening of bids.

**c.** If the base bid of the lowest bidder exceeds the funds available and alternate bid prices will reduce the base bids to an amount that is within the funds available, the lowest bidder will be determined by considering, in order, the fewest number of the alternates that produces a price within the funds available. If the base bid of the lowest bidder is within the funds available and alternate bid prices will permit adding items to the base bid, the lowest bidder will be determined by considering, in order, the greatest number of the alternates that produces a price within the funds available.

**d.** After the lowest bidder has been determined as set forth above, the Awarding Authority may award that bidder any combination of alternates, provided said bidder is also the low bidder when only the Base Bid and such combination of alternates are considered.

## **16. UNIT PRICES:**

**a. Work Bid on a Unit Price Basis.** Where all, or part(s), of the planned Work is bid on a unit price basis, both the unit prices and the extensions of the unit prices constitute a basis of determining the lowest responsible and responsive bidder. In cases of error in the extension of prices of bids, the unit price will govern. A bid may be rejected if any of the unit prices are obviously unbalanced or non-competitive.

**b. Unit Prices for Application to Change Orders.** As a means of predetermining unit costs for changes in certain elements of the Work, the Bid Documents may require that the bidders furnish unit prices for those items in the Proposal Form. Unit prices for application to changes in the work are not a basis for determining the lowest bidder. Non-competitive unit prices proposed by the successful bidder may be rejected and competitive prices negotiated by the Awarding Authority prior to contract award. Unit prices for application to changes in the work are not effective unless specifically included and agreed upon in the Construction Contract.

## **17. AWARD of CONTRACT:**

**a.** The contract shall be awarded to the lowest responsible and responsive bidder unless the Awarding Authority finds that all the bids are unreasonable or that it is not in the best interest of the Awarding Authority to accept any of the bids. A responsible bidder is one who, among other qualities determined necessary for performance, is competent, experienced, and financially able to perform the contract. A responsive bidder is one who submits a bid that complies with the terms and conditions of the Advertisement for Bids and the Bid Documents. Minor irregularities in the bid shall not defeat responsiveness.

**b.** A bidder to whom award is made will be notified by telegram, confirmed facsimile, or letter to the address shown on the Proposal Form at the earliest possible date. Unless other

time frames are stipulated in Supplemental Instructions to Bidders, the maximum time frames allowed for each step of the process between the opening of bids and the issuance of an order to proceed with the work shall be as follows:

(1) Award of contract by Awarding Authority	30 calendar days after the opening of bids
(2) Contractor's return of the fully executed contract, with bonds and evidence of insurance, to the Awarding Authority	15 calendar days after the contract has been presented to the contractor for signature (from the Lead Design Professional)
(3) Awarding Authority's approval of the contractor's bonds and evidence of insurance and completion of contract execution	20 calendar days after the contractor presents complete and acceptable documents to the Architect
(4) Notice To Proceed issued to the contractor along with distribution of the fully executed construction contract to all parties.	15 calendar days after final execution of contract by the Awarding Authority, by various State Agencies if required and by the Governor if his or her signature on the contract is required by law

The time frames stated above, or as otherwise specified in the Bid Documents, may be extended by written agreement between the parties. Failure by the Awarding Authority to comply with the time frames stated above or stipulated in Supplemental Instructions to Bidders, or agreed extensions thereof, shall be just cause for the withdrawal of the contractor's bid and contract without forfeiture of bid security.

**c.** Should the successful bidder or bidders to whom the contract is awarded fail to execute the Construction Contract and furnish acceptable Performance and Payment Bonds and satisfactory evidence of insurance within the specified period, the Awarding Authority shall retain from the bid guaranty, if it is a cashier's check, or recover from the principal or the sureties, if the guaranty is a bid bond, the difference between the amount of the contract as awarded and the amount of the bid of the next lowest responsible and responsive bidder, but not more than \$10,000. If no other bids are received, the full amount of the bid guaranty shall be so retained or recovered as liquidated damages for such default. Any sums so retained or recovered shall be the property of the Awarding Authority.

**d.** All bid guaranties, except those of the three lowest bona fide bidders, will be returned immediately after bids have been checked, tabulated, and the relation of the bids established. The bid guaranties of the three lowest bidders will be returned as soon as the contract bonds and the contract of the successful bidder have been properly executed and approved. When the award is deferred for a period of time longer than 15 days after the opening of the bids, all bid guaranties, except those of the potentially successful bidders, shall be returned. If no award is made within the specified period, as it may by agreement be extended, all bids will be rejected, and all guaranties returned. If any potentially successful bidder agrees in writing to a stipulated extension in time for consideration of its bid and its bid was guaranteed with a cashier's check, the Awarding Authority may permit the potentially successful bidder to substitute a satisfactory bid bond for the cashier's check.

## SPECIAL INSTRUCTIONS TO BIDDERS

### 1.1 INTENT OF INSTRUCTIONS

- A. The Special Instructions to Bidders are intended to amplify the abbreviated Advertisement and to give other details which shall allow interested parties to prepare bids which accurately reflect the scope of the Work. The Special Instructions to Bidders are meant to be viewed as a complement to the general Instructions to Bidders found in the Project Manual. Should any discrepancy or ambiguity be noted, the Special Instructions to Bidders shall defer to the general Instructions to Bidders.

### 1.2 EXPLANATION AND INTERPRETATION

- A. Should any Bidder or subcontractor find any ambiguity, discrepancy, omission, or error in the Drawings and Project Manual, or insufficient information to provide a complete job, or be in doubt as to the intent and meaning thereof, he should at once report such in writing to Architect and request clarification prior to bidding.
- B. Clarification shall be made only by written Addenda during the bid period and sent to all perspective Bidders. The Architect and Consultants shall not be responsible for verbal answers regarding intent or meaning of the Contract Documents, or for any verbal instructions, by whomsoever made, prior to the award of the Contract.
- C. Additionally, all designed systems and/or assemblies are to be proposed and bid as complete assemblies or operational systems. Drawings are indicating intent and not attempting to fully obtain or detail required work.

### 1.3 BIDDER REQUIREMENTS

- A. **All Bidders must honor their bid proposals for a period of 90 calendar days from date of bid opening.**
- B. **The Contractor MUST Field Verify all existing conditions prior to submitting bid proposal.**
- C. **The Apparent Low Bidder AND Apparent Second Lowest Bidder** must submit to the **Architect** a list of the principal Subcontractors, suppliers, and fabricators he plans to use for each category of work. The list of Subcontractors must be received by the Architect within 24 hours following the Bid Opening (email to: [rawlinsonk@mckeeassoc.com](mailto:rawlinsonk@mckeeassoc.com)). Once the successful bidder has obtained approval from the Owner, no changes in Subcontractors shall be made without the express, written consent of the Owner. Contractor shall request consent in writing from the Owner and Architect and provide specific and reasonable explanation as to the necessity of said change. Should said change be approved by the Owner, the Contractor must submit the desired replacement Subcontractor to the Architect and obtain written approval of the Subcontractor.

### 1.4 OPENING OF PROPOSALS

- A. The Owner shall, according to applicable laws and regulations pertaining to bid openings, receive and review all Proposals submitted, according to the method selected below:
  - 1. Proposals shall be opened and read publicly at the time and place indicated in the Advertisement.
  - 2. Proposals may be rejected if they contain any omissions, alterations of forms, additions not called for, conditional bids, alternate bids unless called for, incomplete bids, erasures, or irregularities of any kind. Proposals in which the unit or lump sum prices bid are obviously unbalanced may be rejected. Additions to or deductions from the Bid amount may be written on the outside of the sealed bid, or by letter enclosed in the sealed bid envelope.

### 1.5 DETERMINATION of LOW BIDDER by USE of ALTERNATES

- A. The Awarding Authority may request alternate bid prices (alternates) to facilitate either reducing the base bid to an amount within the funds available for the project or adding items to the base bid within the funds available for the project. Alternates, if any, are listed in the Proposal Form in the order in which they shall cumulatively deduct from or add to the base bid for determining the



lowest bidder.

- B. If alternates are included in the Proposal Form, the Awarding Authority shall determine the dollar amount of funds available and immediately prior to the opening of bids shall announce publicly the funds available for the project. The dollar amount of such funds shall be **used to determine the lowest bidder** as provided herein below, notwithstanding that the actual funds available for the project may subsequently be determined to be more or less than the expected funds available as determined immediately prior to the time of the opening of bids.
- C. **If additional funds become available after the bid opening, the Owner may at his option elect to award to the lowest base bid bidder a contract based on the Contractors base bid amount and additional Alternates.**
- D. If the base bid of the lowest bidder **exceeds** the funds available and alternate bid prices will reduce the base bids to an amount that is **within** the funds available, the lowest bidder will be determined by considering, in order, the fewest number of the alternates that produces a price within the funds available.
- E. If the base bid of the lowest bidder is within the funds available and alternate bid prices will permit adding items to the base bid, the lowest bidder will be determined by considering, in order, the greatest number of the alternates that produces a price within the funds available.
- F. After the lowest bidder has been determined as set forth above, the Awarding Authority may award that bidder any combination of alternates, provided said bidder is also the low bidder when only the Base Bid and such combination of alternates are considered.

#### **1.6 AWARD OF CONTRACT**

- A. The Bidder to whom the award is made shall be notified by letter to the address shown on his Proposal at the earliest possible date. At such time, at the option of the Owner, additional information such as a complete financial statement may be required from the successful Bidder.

#### **1.7 EXECUTION OF CONTRACT**

- A. The Contract shall be signed by the successful Bidder, in the number of counterparts provided in the Contract Agreement and returned to the Owner with satisfactory Contract Bonds within ten (10) days after the date of Notice of Award.

#### **1.8 PERFORMANCE BOND AND PAYMENT BOND**

- A. The intent of the Performance Bond is to ensure the faithful performance of each and every condition, stipulation, and requirements of the Contract and to indemnify and save harmless the Owner, Architect, and Consultants from any and all damages, either directly or indirectly (arising out of any failure to perform same). The successful Bidder to whom the Contract is awarded shall furnish at his expense an acceptable Performance Bond in an amount equal to one hundred percent (100%) of the Contract Price of the Contract as awarded. Said Bond shall be made on the approved Bond form, shall be furnished by a surety company duly authorized and qualified to make such bonds in the State of Alabama, shall be countersigned by an authorized agent resident in the State who is qualified for the execution of such instruments, and shall have attached thereto power of attorney of the signing official. In case of default on the part of the Contractor, all expenses incident to ascertaining and collecting losses suffered by the Owner under the Bond, the direct costs of administration, architectural, engineering, and legal services, shall lie against the Contract Bond for Performance of the Work.
- B. In addition thereto, the successful Bidder to whom the Contract is awarded shall furnish at his expense a Payment Bond with good and sufficient surety payable to the Owner in an amount not less than one hundred percent (100%) of the Contract Price, with the obligation that the Contractor shall promptly make payment to all persons furnishing him or them with labor, material, feedstuffs, or supplies for or in prosecution of the Work provided for in the Contract and for the payment or reasonable attorneys' fees, incurred by successful claimants or plaintiffs in suits on said Bond.

## **1.9 APPROVAL OF CONTRACT**

- A. No Contract is binding upon the Owner until it has been executed by the Owner and the successful Bidder and copies delivered.

## **1.10 CAD FILES**

- A. Digital Unlocked Project CAD Files may be requested by emailing [cadoperator@mckeeassoc.com](mailto:cadoperator@mckeeassoc.com) and follow instructions as required.

## **1.11 LIST OF SUBCONTRACTORS**

- A. **The Apparent Low Bidder AND Apparent Second Lowest Bidder** must submit to the Architect a list of the principal Subcontractors, suppliers, and fabricators he plans to use for each category of work. The list of Subcontractors must be received by the Architect within twenty-four hours following the Bid Opening. Email to [rawlinsonk@mckeeassoc.com](mailto:rawlinsonk@mckeeassoc.com). Once the successful bidder has obtained approval from the Owner, no changes in Subcontractors shall be made without the express, written consent of the Owner.

## 1.12 LIST OF SUBCONTRACTORS SUBMITTAL FORM

Email this form in its entirety to contact listed below.

The **Apparent Low Bidder** AND **Apparent Second Lowest Bidder** must submit to the Architect a list of the principal Subcontractors, suppliers, and fabricators he plans to use for each category of work. The list of Subcontractors must be received by the Architect within twenty-four hours following the Bid Opening.

To: McKee & Associates, Architects

Kayla Rawlinson

[rawlinsonk@mckeeassoc.com](mailto:rawlinsonk@mckeeassoc.com)

*Email*

From: \_\_\_\_\_

*Company*

*Name*

*Email*

Project Name: \_\_\_\_\_

*Phone Number*

Project Number: \_\_\_\_\_

Issue Date: \_\_\_\_\_

Bid Date: \_\_\_\_\_

Category of Work	Name of Sub to Perform Work	Name of Supplier

**END OF SECTION**

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

SPECIAL INSTRUCTIONS TO BIDDERS  
PAGE-4

- (1) *Do not staple this form and/or attachments; use clips. Print single-sided; do not submit double-side printed documents.*

**DCM (BC) Project No.**

## CONSTRUCTION CONTRACT

- (2) This Construction Contract is entered into this                      day of                      in the year of
- (3) between the **OWNER**,  
Entity Name:  
Address:  
Email & Phone #:
- (4) and the **CONTRACTOR**,  
Company Name:  
Address:  
Email & Phone #:
- (5) for the **WORK** of the Project, identified as:
- (6) The **CONTRACT DOCUMENTS** are dated                      and have been amended by
- (7) **ADDENDA**
- (8) The **ARCHITECT** is  
Firm Name:  
Address:  
Email & Phone #:
- (9) The **CONTRACT SUM** is  
Dollars (\$)                      ) and is the sum of the Contractor's Base Bid for the Work and the following
- (10) **BID ALTERNATE PRICES:**
- (11) The **CONTRACT TIME** is                      (                      ) calendar days.

**THE OWNER AND THE CONTRACTOR AGREE AS FOLLOWS:** The Contract Documents, as defined in the General Conditions of the Contract (DCM Form C-8), are incorporated herein by reference. The Contractor shall perform the Work in accordance with the Contract Documents. The Owner will pay and the Contractor will accept as full compensation for such performance of the Work, the Contract Sum subject to additions and deductions (including liquidated damages) as provided in the Contract Documents. The Work shall commence on a date to be specified in a Notice to Proceed issued by the Owner or the Director, Alabama Division of Construction Management, and shall then be substantially completed within the Contract Time.

- (12) **LIQUIDATED DAMAGES** for which the Contractor and its Surety (if any) shall be liable and may be required to pay the Owner in accordance with the Contract Documents shall be equal to six percent interest per annum on the total Contract Sum unless a dollar amount is stipulated in the following space, in which case liquidated damages shall be determined at \_\_\_\_\_ dollars (\$ \_\_\_\_\_) per calendar day.

Numbers in margin correspond to "Checklist", DCM Form B-7

- (13) **SPECIAL PROVISIONS** *(Special Provisions may be inserted here, such as acceptance or rejection of unit prices. If Special Provisions are continued in an attachment, identify the attachment below):*

- (14) **STATE GENERAL CONTRACTOR'S LICENSE:** The Contractor does hereby certify that Contractor is currently licensed by the Alabama State Licensing Board for General Contractors and that the certificate for such license bears the following:

License No.:

Classification(s):

Bid Limit:

The Owner and Contractor have entered into this Construction Contract as of the date first written above and have executed this Construction Contract in sufficient counterparts to enable each contracting party to have an originally executed Construction Contract each of which shall, without proof or accounting for the other counterparts, be deemed an original thereof.

The Owner does hereby certify that this Construction Contract was let in accordance with the provisions of Title 39, Code of Alabama 1975, as amended, and all other applicable provisions of law, and that the terms and commitments of this Construction Contract do not constitute a debt of the State of Alabama in violation of Article 11, Section 213 of the Constitution of Alabama, 1901, as amended by Amendment Number 26.

(15)

**APPROVAL**

**ALABAMA STATE DEPARTMENT OF EDUCATION  
(SDE)**  
*(Required for locally-funded, SDE projects.)*

By \_\_\_\_\_ Date: \_\_\_\_\_  
State Superintendent of Education

**CONTRACTING PARTIES**

\_\_\_\_\_  
Contractor Company

By \_\_\_\_\_  
Signature

Name & Title \_\_\_\_\_

\_\_\_\_\_  
Owner Entity

By \_\_\_\_\_  
Signature

Name(s) & Title(s) \_\_\_\_\_

Review/Signature flow: Architect/Engineer (prepare documents) > Contractor (review and sign) > Architect/Engineer (review) > Owner (review and sign) > SDE (review, sign and distribute the fully executed Contract to all parties, and forward a copy to the Alabama Division of Construction Management [DCM]). Note: DCM does not sign fully locally-funded SDE project contract documents.

ALABAMA DEPARTMENT OF FINANCE  
CONSTRUCTION MANAGEMENT DIVISION  
ADMINISTRATIVE CODE

CHAPTER 355-16-1  
COLLECTION OF USER FEES

TABLE OF CONTENTS

ED NOTE: THE RULES OF THE BUILDING COMMISSION, CHAPTER 170-X-8, WERE TRANSFERRED TO THE DEPARTMENT OF FINANCE PURSUANT TO ACT 2015-435.

355-16-1-.01	Applicability
355-16-1-.02	Calculation Of Basic Plan Review And Permit Fees
355-16-1-.03	Fees Required
355-16-1-.04	Payment Of Fees
355-16-1-.05	Final Reconciliation Of Fees
355-16-1-.06	Penalties
355-16-1-.07	Contract Document Administration Fees (Repealed 1/13/20)

**355-16-1-.01 Applicability.** The following procedures and user fees are applicable to new construction, additions, or alteration projects for buildings under the jurisdiction of the Alabama Division of Construction Management as defined by the Code of Ala. 1975, Title 41, Section 41-9-162 and authorized by Section 41-4-400(a)(7).

**Author:** Frank Barnes

**Statutory Authority:** Code of Ala. 1975, §41-4-400(a)(7).

**History: New Rule:** Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

**355-16-1-.02 Calculation Of Basic Plan Review And Permit Fees.**

Construction Cost	Basic Plan Review Fee	Basic Permit Fee
Less than \$1000	No fee.	No fee, unless inspection required, in which case a \$15.00 fee for each inspection shall be charged.
\$1,001 to \$50,000	One-half of the permit fee which is \$15.00 for the first \$1,000.00 plus \$5.00 for each additional thousand or fraction thereof, to and including \$50,000.00.	\$15.00 for the first \$1,000.00 plus \$5.00 for each additional thousand or fraction thereof, to and including \$50,000.00.
\$50,001 to \$100,000	One-half of the permit fee which is \$260.00 for the first \$50,000.00 plus \$4.00 for each additional thousand or fraction thereof, to and including \$100,000.00.	\$260.00 for the first \$50,000.00 plus \$4.00 for each additional thousand or fraction thereof, to and including \$100,000.00.
\$100,001 to \$500,000	One-half of the permit fee which is \$460.00 for the first \$100,000.00 plus \$3.00 for each additional thousand or fraction thereof, to and including \$500,000.00.	\$460.00 for the first \$100,000.00 plus \$3.00 for each additional thousand or fraction thereof, to and including \$500,000.00.
\$500,001 and up	One-half of the permit fee which is \$1,660.00 for the first \$500,000.00 plus \$2.00 for each additional thousand or fraction thereof.	\$1,660.00 for the first \$500,000.00 plus \$2.00 for each additional thousand or fraction thereof.

Construction Cost: Construction Cost shall include the cost of the actual building construction, addition, or alteration work, including sitework.

**Authors:** Katherine Lynn, Frank Barnes

**Statutory Authority:** Code of Ala. 1975, §41-9-141(a)(8).

**History: New Rule:** Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

### 355-16-1-.03 Fees Required.

(1) The Basic Plan Review Fee, the Basic Permit Fee, and the Basic Contract Document Administration Fee are subject to the Final Reconciliation at the close of construction as described in Rule 355-16-1-.05.

(2) Basic Plan Review Fee: This fee includes review of Schematic, Preliminary, Final, and one revised Final Plan Submittal.

(a) If the first submittal of a new project is for a schematic or preliminary review, it shall be accompanied by ½ of the Basic Plan Review Fee not to exceed \$500. Submittals sent in without this fee will not be reviewed until payment is received.

(b) The final submittal of each project shall be accompanied by a payment for the balance of the Basic Plan Review Fee. Submittals sent in without this final submittal fee will not be reviewed until payment is received.

(c) Written final plan review comments must be sent by the Division of Construction Management to the architect within 30 calendar days of receipt of the submittal. If the submittal is not reviewed within this time limitation, the balance of the Basic Plan Review Fee is waived.

(3) Basic Permit Fee: This fee shall include the following required major building inspections: Pre-Construction Conference, Pre-Roofing Conference, Above-Ceiling Inspection, Final Inspection, and Year-End Inspection. Additional required inspections such as fire alarm inspections, kitchen hood inspections, elevator inspections, and other such inspections shall be included as part of the Basic Permit Fee.

(a) The Basic Permit Fee is due upon approval or receipt of the Construction Contract. The Pre-Construction Conference will not be performed prior to receipt of the Basic Permit Fee.

(4) Basic Contract Document Administration Fee: The Basic Contract Document Administration Fee applies to contracts that are administered by the Division of Construction Management. The fee covers review of the Owner/Architect Agreement and Construction Contract along with related amendments, change orders, service invoices, and pay requests.



(a) Payment must be received before the associated contract is fully executed. The total fee is ½% of the Construction Cost and it is paid in the following 2 parts:

(i) ¼% of the Project Budget for the Owner/Architect Agreement

(ii) ¼% of the Construction Cost for the Construction Contract.

(5) Additional Fees:

(a) If more than one revised Final Plan Submittal is required, an additional fee shall be required for each additional revised submittal. This additional fee shall be equal to the lesser of the following: 15% of the Basic Plan Review Fee or \$2000. The time restrictions and conditions which apply to routine submittals shall apply to additional submittals.

(b) If the contractor schedules an inspection and it is determined by the Division of Construction Management Inspector on site that the contractor has not met required benchmarks or the inspection is cancelled without 48-hours' notice, the Division of Construction Management shall require an additional fee of \$1500. This additional inspection fee shall be applied to each additional inspection that is required to be rescheduled.

(c) Changes to plans for rebid or a significant revision in the scope of work may incur an additional fee, up to the amount of the Basic Plan Review Fee, based on the reviewers' evaluation of the extent of the changes reviewed.

(d) Projects owned and locally funded by municipality and county governments must be submitted for a review for compliance with the current ADA Standards for Accessible Design. The additional fee for this service is 50% of the Basic Plan Review Fee, with a maximum of \$500.00. If more than one revised Final Plan Submittal is required, the fee for each additional review will be 15% of the Basic Plan Review Fee.

(e) In addition to the Schematic, Preliminary, and Final Review Submittals, the Owner may request an optional 65% Intermediate Review to include all systems of the project at a point that is less than 100% complete. The additional fee for this review will be 65% of the Basic Plan Review Fee.

(f) The Basic Contract Document Administration Fee includes review of the original submitted document and one revision. When more than one revision is required, an additional fee of \$200 will be charged to the design professional for each additional document submittal until the document is executed.

**Author:** Frank Barnes

**Statutory Authority:** Code of Ala. 1975, §41-9-141(a)(8).

**History: New Rule:** Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

#### **355-16-1-.04    Payment Of Fees.**

(1) The balance of the Basic Plan Review Fee payment shall be accompanied by the "Plan Review Fee Worksheet" and a copy of the architect's latest estimated Construction Cost. The cost estimate shall be the basis for calculating the estimated Basic Plan Review Fee on the fee worksheet.

(2) The Basic Permit Fee payment shall be accompanied by the completed "Permit Fee Worksheet" and a copy of the executed Construction Contract. The Construction Contract shall be the basis for calculating the total fee on the fee worksheet.

(3) Fee payments are nonrefundable to the extent that work has been performed by the Division of Construction Management.

(4) Fee payments shall be paid by either (i) check or money order made payable to "Alabama Department of Finance-Division of Construction Management," (ii) by an electronic means accepted by the Division of Construction Management, or (iii) an inter-agency transfer. Fees are deemed paid when the funds represented by the payment method are received by or made available to the Division of Construction Management.

(5) Check or money order payments shall be received only at the Division of Construction Management's office in Montgomery.

**Authors:** Katherine Lynn, Frank Barnes

**Statutory Authority:** Code of Ala. 1975, §41-9-141(a)(8).

**History:** **New Rule:** Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

**355-16-1-.05     Final Reconciliation Of Fees.**

(1)            Final Reconciliation: The Basic Plan Review Fee, the Basic Permit Fee, and the Basic Contract Document Administration Fee are paid based on the best estimate of the Construction Cost at the time each fee is due. When construction is complete, a Final Reconciliation will recalculate each of these fees using the actual Construction Cost. The Final Reconciliation will determine the amount due from or refunded to the Owner. The Owner has the final responsibility for payment of all fees.

(2)            The actual Construction Cost for the final Basic Plan Review Fee shall be adjusted to include the lowest bid on any additive unawarded alternates from the bid tab. The actual Construction Cost for the final Basic Permit Fee and the final Basic Contract Document Administration Fee shall be adjusted for any change orders and for any sales-tax credit received by the Owner.

**Author:** Katherine Lynn

**Statutory Authority:** Code of Ala. 1975, §41-9-141(a)(8).

**History:** **New Rule:** Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Repealed and New Rule:** Published November 29, 2019; effective January 13, 2020.

**355-16-1-.06     Penalties.** Where work, for which Division of Construction Management approval is required, is started or proceeds prior to obtaining said approval, the fees herein specified shall be doubled. The payment of such double fee shall not relieve any persons from fully complying with the requirements of the Division of Construction Management in the execution of the work nor from any other penalties prescribed herein.

**Author:** Frank Barnes

**Statutory Authority:** Code of Ala. 1975, §41-9-141(a)(8).

**History:** **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

**355-16-1-.07     Contract Document Administration Fees.**  
**(REPEALED)**

**Author:** Katherine Lynn

**Statutory Authority:** Code of Ala. 1975, §41-9-141(a)(8.

**History:** **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Repealed:** Published November 29, 2019; effective January 13, 2020.



# ALABAMA DEPARTMENT OF FINANCE REAL PROPERTY MANAGEMENT Division of Construction Management

www.dcm.alabama.gov, 334-242-4082, inspections@realproperty.alabama.gov

Revised August 2021

Department Use Only
Invoice # _____
Date Paid _____
Confirmation # _____

## PERMIT FEE & PERMIT RE-INSPECTION FEE CALCULATION WORKSHEET

DCM (BC) # _____	Date _____
Project Name; Owner/Architect/Engineer Project # & Phase/Package # _____	
Owner Entity Name _____	
Architect/Engineer Firm Name _____	
Contractor Company Name _____	
Select only ONE of the following:	
<div>Basic Permit Fee. Fee is based on awarded contract sum.</div>	<div>ACCS Storm Shelter Permit Fee. AL Community College System (ACCS) storm shelter-related projects started after 07/31/21: Fee is based on total cost estimate of storm shelter (not just fortification upcharge), utilities connecting to storm shelter, and means of egress (including exit passageways/corridors, exit, exit discharges).</div>
<div>Permit Re-Inspection Flat Fee.</div>	
Awarded Contract Sum, or ACCS Storm Shelter Area Estimate: _____	
Email address(es) for Payment Receipt: _____	

### BASIC PERMIT FEE CALCULATION:

**Awarded Contract Sum or ACCS Storm Shelter Area Estimate is less than \$1,000:** N/A

**Awarded Contract Sum or ACCS Storm Shelter Area Estimate is \$1,001 - \$50,000:**

Contract Sum or Shelter Estimate less \$1,000= \_\_\_\_\_ / 1,000 x \$5.00= \_\_\_\_\_ + \$15.00= \_\_\_\_\_

**Awarded Contract Sum or ACCS Storm Shelter Area Estimate is \$50,001 - \$100,000:**

Contract Sum or Shelter Estimate less \$50,000= \_\_\_\_\_ / 1,000 x \$4.00= \_\_\_\_\_ + \$260.00= \_\_\_\_\_

**Awarded Contract Sum or ACCS Storm Shelter Area Estimate is \$100,001 - \$500,000:**

Contract Sum or Shelter Estimate less \$100,000= \_\_\_\_\_ / 1,000 x \$3.00= \_\_\_\_\_ + \$460.00= \_\_\_\_\_

**Awarded Contract Sum or ACCS Storm Shelter Area Estimate is \$500,001 and up:**

Contract Sum or Shelter Estimate less \$500,000= \_\_\_\_\_ / 1,000 x \$2.00= \_\_\_\_\_ + \$1,660.00= \_\_\_\_\_

### PERMIT RE-INSPECTION FEE:

**Flat fee of \$1,500.00 per occurrence**

**TOTAL DUE:** \_\_\_\_\_

**Basic Permit Fee:** Covers all required pre-construction conferences, construction inspections and certificate of substantial completion issuance by the DCM Inspector. This fee is due when a construction contract or self-performance letter is received by DCM and must be paid before the required Pre-Construction Conference is scheduled with the DCM Inspector.

**ACCS Storm Shelter Permit Fee:** Covers all required storm shelter pre-construction meetings and construction inspections by the DCM Inspector. This fee is due when a copy of the construction contract and Notice-to-Proceed is received by DCM and must be paid before the required Storm Shelter Pre-Construction Meeting is scheduled with the DCM Inspector.

**Permit Re-Inspection Fee:** May be charged if (A) the contractor has not completed the work required for the particular inspection as detailed in DCM Form B-8: Pre-Construction Conference Checklist, or (B) the inspection is canceled or rescheduled without the required minimum 48 hours notice to all parties.

Make check payable to: "Finance - Construction Management," include the DCM (BC) Project # on the check and attach the fee worksheet. Mail payment to: Finance - Construction Management, P.O. Box 301150, Montgomery, AL 36130-1150.

State agency inter-fund transfer and payments using Public School and College Authority (PSCA) funds: contact Jennie Jones at 334-242-4808 or jennie.jones@realproperty.alabama.gov.

Fees may be paid online at www.dcm.alabama.gov (in which case a completed fee worksheet is not required).

The Basic Permit Fee and ACCS Storm Shelter Permit Fee is subject to Final Reconciliation of Fees at the end of construction.



JULIE P. MAGEE  
Commissioner

# State of Alabama Department of Revenue

([www.revenue.alabama.gov](http://www.revenue.alabama.gov))  
50 North Ripley Street  
Montgomery, Alabama 36132

MICHAEL E. MASON  
Assistant Commissioner

JOE W. GARRETT, JR.  
Deputy Commissioner

CURTIS E. STEWART  
Deputy Commissioner

## Alabama Department of Revenue NOTICE

### Tax Guidance for Contractors, Subcontractors and Alabama Governmental Entities Regarding Construction-related Contracts

Legislative Act 2013-205 requires the Department of Revenue to issue Form STC-1, *Sales and Use Tax Certificate of Exemption for Government Entity Projects*, to all contractors and subcontractors working on qualifying governmental entity projects once the Form ST: EXC-01 is approved.

Each exempt entity, contractor and subcontractor must make application for qualification of the exemption using Form ST: EXC-01 for each tax-exempt project. The application is available on the department's website at <http://revenue.alabama.gov/salestax/ST-EXC-01.pdf>. Applications should be submitted directly to the Sales and Use Tax Division Central Office, P.O. Box 327710, Montgomery, AL 36132-7710.

The sales and use tax exemption provided for in Act 2013-205 applies to the purchase of building materials, construction materials and supplies, and other tangible personal property that become part of the structure pursuant to a qualifying contract entered into on or after January 1, 2014. Qualifying projects and contracts are those generally entered into with the following governmental entities, unless otherwise noted: the State of Alabama, a county or incorporated municipality of Alabama, an Alabama public school, or an Alabama industrial or economic development board or authority already exempt from sales and use taxes. **Please note that contracts entered into with the federal government and contracts pertaining to highway, road, or bridge construction or repair do not qualify for the exemption provided for in Act 2013-205.** [Reference: Sales and Use Tax Division Administrative Rule 810-6-3-.77 *Exemption for Certain Purchases by Contractors and Subcontractors in Conjunction with Construction Contracts with Certain Governmental Entities*.]

The Alabama Department of Revenue will assign each contractor and sub-contractor a consumers use tax account, if one is currently not in place, at the time the Form STC-1, *Sales and Use Tax Certificate of Exemption for Government Entity Projects*, is issued.

Contractors and sub-contractors for qualifying projects will be required to file monthly consumers use tax returns and report all exempt purchases for ongoing projects, as well as all taxable purchases on one return. These returns are required to be filed through the department's online tax return filing and payment portal, My Alabama Taxes (<https://myalabamataxes.alabama.gov>).

As another option for these types of contracts, as well as with other contracts entered into with other types of exempt entities, the Form ST:PAA1, *Purchasing Agent Appointment*, may be used. However, please be advised that the use of the Form ST:PAA1 option will require the exempt entity to be invoiced directly and pay for directly from their funds any construction and building material and supply purchases.

For additional information concerning this guidance, taxpayers should contact Sales and Use Tax Division representative Thomas Sims at 334-242-1574 or by email at [Thomas.Sims@revenue.alabama.gov](mailto:Thomas.Sims@revenue.alabama.gov).



ALABAMA DEPARTMENT OF REVENUE  
SALES AND USE TAX DIVISION  
P.O. Box 327710 • Montgomery, AL 36132-7710

ST: EXC-01  
6/21

# Application For Sales and Use Tax Certificate of Exemption

## FOR GOVERNMENT ENTITY PROJECT

This Certificate of Exemption will be limited to purchases which qualify for an exemption of sales and use taxes pursuant to Rule No. 810-6-3-.77

### PROJECT INFORMATION:

PROJECT NAME			PROJECT OWNER'S FEIN (EXEMPT ENTITY)		
STREET ADDRESS OF PROJECT (CITY AND COUNTY INCLUDED)		CITY	ZIP	COUNTY	

### APPLICANT'S INFORMATION:

RELATION: (CHOOSE ONE)

☐ Government Entity    ☐ General Contractor    ☐ Subcontractor

APPLICANT'S LEGAL NAME			FEIN		
DBA			CONSUMER'S USE TAX ACCOUNT NUMBER		
MAILING ADDRESS: STREET		CITY	STATE	ZIP	COUNTY
CONTACT PERSON				BUSINESS TELEPHONE NUMBER (     )	
EMAIL ADDRESS					

CONTRACT SIGN DATE (PROVIDED BY GENERAL CONTRACTOR)		CONTRACT COMPLETION DATE (PROVIDED BY GENERAL CONTRACTOR)	
ESTIMATED START DATE (FOR APPLICANT)		ESTIMATED COMPLETION DATE (FOR APPLICANT)	
WILL THE APPLICANT HAVE ANY SUBCONTRACTORS ON THIS JOB? <input type="checkbox"/> Yes <input type="checkbox"/> No    If yes, please attach list.		NAME OF PARTY TO THE CONTRACT	
JOB DESCRIPTION			

WILL ANY POLLUTION CONTROL EXEMPTION BE APPLICABLE? <input type="checkbox"/> Yes <input type="checkbox"/> No		ESTIMATED POLLUTION CONTROL COST \$	
TOTAL PROJECT BID AMOUNT (APPLICANT'S PORTION OF PROJECT) \$	LABOR COST (APPLICANT'S PORTION OF PROJECT) \$	MATERIAL COST (APPLICANT'S PORTION OF PROJECT) \$	

### REVENUE DEPARTMENT USE ONLY

PENDING DOCUMENTATION / INFORMATION:

☐ GCL    ☐ SBL    ☐ Contract / NTP / LOI    ☐ LOS    ☐ Contract Dates / Breakdown of Costs

Contact Dates: \_\_\_\_\_ Received Date: \_\_\_\_\_

Forwarded for Denial: \_\_\_\_\_

PROJECT NAME

PROJECT OWNER'S FEIN (EXEMPT ENTITY)

FORM OF OWNERSHIP:

☐ Individual ☐ Partnership ☐ Corporation ☐ Multi member LLC ☐ Single member LLC ☐ Government Entity

If applicant is a corporation, a copy of the certified certificate of incorporation, amended certificate of incorporation, certificate of authority, or articles of incorporation should be attached. If the applicant is a limited liability company or a limited liability partnership, a copy of the certified articles of organization should be attached.

OWNERSHIP INFORMATION:

Corporations – give name, title, home address, and Social Security Number of each officer.

Partnerships – give name, home address, Social Security Number or FEIN of each partner.

Sole Proprietorships – give name, home address, Social Security Number of owner.

LLC – give name, home address, and Social Security Number or FEIN of each member.

LLP – give name, home address, and Social Security Number or FEIN of each partner.

NAME (PLEASE PRINT)

SIGNATURE

TITLE

DATE

REVENUE DEPARTMENT USE ONLY

PENDING OTHER:

☐ Government Entity ☐ General Contractor ☐ Not on LOS

Contact Dates: \_\_\_\_\_ Received Date: \_\_\_\_\_

Forwarded for Denial: \_\_\_\_\_

Examiner's Remarks \_\_\_\_\_

Examiner \_\_\_\_\_ Date \_\_\_\_\_



## Instructions For Preparation of Form ST: EXC-01 Sales and Use Tax Certificate of Exemption for Government Entity Project

NOTE: Exemption Certificates will be issued as of the contract sign date or the received date of the application. If, upon receipt of the application, the project has already commenced, the certificate will be issued as of the received date of the application. Any purchases made prior to the issuance of a certificate will not be exempt.

**\*\*\* Please allow 10 to 14 business days for your application to be processed. \*\*\***

In order to expedite the processing of your application, please include the following documentation when submitting your application:

### **Exempt Entity:**

1. Signed Application
2. Copy of Executed/Signed Contract, Letter of Intent, Notice of Award, and/or Notice to Proceed

### **General Contractor:**

1. Signed Application
2. Copy of Executed/Signed Contract, Letter of Intent, Notice of Award, and/or Notice to Proceed
3. List of Subcontractors
4. Alabama Board of General Contractor's License
5. State/County Business License (usually obtained through county probate office)
6. Any other municipal business licenses associated with the project

### **Subcontractor:**

1. Signed Application
2. Alabama Board of General Contractor's License
3. State/County Business License (usually obtained through county probate office)
4. Any other municipal business licenses associated with the project
5. List of Subcontractors (if any)

### **General contractors and subcontractors:**

- Any additions and/or deletions to the list of subcontractors working on a project must be submitted to the Department within 30 days of occurrence.
- If an extension is needed for a project, please contact the Department of Revenue at the address, number, or email listed below. Extension requests should be submitted no more than 30 days after expiration date.
- Subcontractor's Estimated Start Date should be the date they will begin working on the project and ordering materials instead of the General Contractor's Estimated Start Date for the project.

THERE IS A FILING REQUIREMENT IF YOUR APPLICATION IS APPROVED. The return will be filed through the Consumer's Use Tax account. Please see the following page for detailed instructions and general information regarding the reporting requirements.

The application and required documentation may be mailed, faxed, or emailed to the following:

Fax: (334) 353-7867

Email: STExemptionUnit@revenue.alabama.gov

Mailing Address: ATTN: Contractor's Exemption  
Alabama Department of Revenue  
Sales & Use Tax Division  
Room 4303  
PO Box 327710  
Montgomery, AL 36132-7710

## *General Information and Instructions Regarding the Reporting Requirements for Contractors Awarded an Exemption Certificate*

A contractor's exemption certificate for a Government Entity project is needed in order to purchase materials tax exempt for the qualified project. Once the exemption certificate has been applied for and awarded, there is a monthly filing requirement to report the purchases that have been made for each exempt project. The Consumer's Use (CNU) tax account is used to report the tax-exempt purchases made with each certificate for each exempt project for each month.

The consumer's use tax return must be filed for each of the months covered by the exemption certificate. (For example, if the certificate's effective date is June 29, 2014 and the expected completion date is October 1, 2014, a consumer's use tax return must be filed for each of the following months: June, July, August, September, and October.) A return **MUST** be filed each month to report the monthly purchases. Therefore, all active exemption certificates must be included on the monthly report even if the monthly purchases for a specific project was \$0.

If a CNU tax account is not already open under the taxpayer/business name, one will automatically be assigned at the time the exemption certificate is generated. Electronic filing is required through the Department's online filing system, My Alabama Taxes (MAT). A letter containing the online filing information will be mailed to the address on file within a few days after the new CNU tax account has been assigned. This letter will contain all the information needed to create your online filing account in MAT. For questions relating to setting up the account on [www.myalabamataxes.alabama.gov](http://www.myalabamataxes.alabama.gov), please contact Business Registration at 334-242-1584 or the Sales Tax Division at 1-866-576-6531.

Once the MAT account is set up, please log in and file the monthly CNU tax return. There is a table located at the bottom left hand corner labeled "Contractor's Exemption for Government Construction Projects." All three fields in the table are required to be completed: exemption number, project number, and total amount of purchases for that specific project for the month. Additional projects may be added on the additional rows that appear as data is added; the table will allow the addition of more projects.

\*\*\*Please do not use lines 1 through 9 of the return for reporting exempt project information. Leave these lines blank unless taxable purchases were made outside of the state of Alabama that need to be reported and tax remitted. (Lines 1 through 9 do not have anything to do with the exemption reporting requirements).

When the certificate expires (upon the project's completion) and the CNU tax account is no longer needed, please contact the Business Registration Unit at 334-242-1584 and close the CNU tax account. Please be advised that if there are multiple government entity projects open, the consumer's use tax account should remain open until the last project completion date. For example, if Project EXC00ABCD ends in June of 2014 but Project EXC00EFGH ends January of 2015, the CNU tax account must remain open until the end of January 2015. A return for Project EXC00EFGH must be filed all the way through January 2015.

If the applicant already has a CNU tax account and it is currently set up online, please use this account to report exempt project purchases through [www.myalabamataxes.alabama.gov](http://www.myalabamataxes.alabama.gov) using the instructions provided above. The return may then be filed as usual.

\*\*\*All Consumer's Use Tax returns are due on the 20th of the month following the month in which purchases were made (i.e., the return for the month of June is due July 20th, etc. There are 20 days to file the return before it is deemed late.)

\*\*\*Any penalty waiver requests may be directed to the Sales and Use Tax Division at 1-866-576-6531. Only one waiver per 18 month period is allowed.



# State of Alabama Disclosure Statement

Required by Article 3B of Title 41, Code of Alabama 1975

ENTITY COMPLETING FORM

ADDRESS

CITY, STATE, ZIP

TELEPHONE NUMBER

( )

STATE AGENCY/DEPARTMENT THAT WILL RECEIVE GOODS, SERVICES, OR IS RESPONSIBLE FOR GRANT AWARD

ADDRESS

CITY, STATE, ZIP

TELEPHONE NUMBER

( )

This form is provided with:

☐

Contract

☐

Proposal

☐

Request for Proposal

☐

Invitation to Bid

☐

Grant Proposal

Have you or any of your partners, divisions, or any related business units previously performed work or provided goods to any State Agency/Department in the current or last fiscal year?

☐

Yes

☐

No

If yes, identify below the State Agency/Department that received the goods or services, the type(s) of goods or services previously provided, and the amount received for the provision of such goods or services.

STATE AGENCY/DEPARTMENT

TYPE OF GOODS/SERVICES

AMOUNT RECEIVED

Have you or any of your partners, divisions, or any related business units previously applied and received any grants from any State Agency/Department in the current or last fiscal year?

☐

Yes

☐

No

If yes, identify the State Agency/Department that awarded the grant, the date such grant was awarded, and the amount of the grant.

STATE AGENCY/DEPARTMENT

DATE GRANT AWARDED

AMOUNT OF GRANT

1. List below the name(s) and address(es) of all public officials/public employees with whom you, members of your immediate family, or any of your employees have a family relationship and who may directly personally benefit financially from the proposed transaction. Identify the State Department/Agency for which the public officials/public employees work. (Attach additional sheets if necessary.)

NAME OF PUBLIC OFFICIAL/EMPLOYEE

ADDRESS

STATE DEPARTMENT/AGENCY

2. List below the name(s) and address(es) of all family members of public officials/public employees with whom you, members of your immediate family, or any of your employees have a family relationship and who may directly personally benefit financially from the proposed transaction. Identify the public officials/public employees and State Department/Agency for which the public officials/public employees work. (Attach additional sheets if necessary.)

NAME OF FAMILY MEMBER	ADDRESS	NAME OF PUBLIC OFFICIAL/ PUBLIC EMPLOYEE	STATE DEPARTMENT/ AGENCY WHERE EMPLOYED
-----------------------	---------	---	--

If you identified individuals in items one and/or two above, describe in detail below the direct financial benefit to be gained by the public officials, public employees, and/or their family members as the result of the contract, proposal, request for proposal, invitation to bid, or grant proposal. (Attach additional sheets if necessary.)

Describe in detail below any indirect financial benefits to be gained by any public official, public employee, and/or family members of the public official or public employee as the result of the contract, proposal, request for proposal, invitation to bid, or grant proposal. (Attach additional sheets if necessary.)

List below the name(s) and address(es) of all paid consultants and/or lobbyists utilized to obtain the contract, proposal, request for proposal, invitation to bid, or grant proposal:

NAME OF PAID CONSULTANT/LOBBYIST	ADDRESS
----------------------------------	---------

**By signing below, I certify under oath and penalty of perjury that all statements on or attached to this form are true and correct to the best of my knowledge. I further understand that a civil penalty of ten percent (10%) of the amount of the transaction, not to exceed \$10,000.00, is applied for knowingly providing incorrect or misleading information.**

Signature	Date
-----------	------

Notary's Signature	Date	Date Notary Expires
--------------------	------	---------------------

Article 3B of Title 41, Code of Alabama 1975 requires the disclosure statement to be completed and filed with all proposals, bids, contracts, or grant proposals to the State of Alabama in excess of \$5,000.

## Disclosure Statement Information and Instructions

Section 41-16-82, *Code of Alabama* 1975 requires the disclosure statement to be completed and filed with all proposals, bids, contracts, or grant proposals to the State of Alabama in excess of \$5,000. The disclosure statement is not required for contracts for gas, water, and electric services where no competition exists, or where rates are fixed by law or ordinance. In circumstances where a contract is awarded by competitive bid, the disclosure statement shall be required only from the person receiving the contract and shall be submitted within ten (10) days of the award.

Section 41-16-85, *Code of Alabama* 1975 requires that a copy of the disclosure statement shall be filed with the awarding entity and the Department of Examiners of Public Accounts, and if it pertains to a state contract, a copy shall be submitted to the Contract Review Permanent Legislative Oversight Committee. The address for the Department of Examiners of Public Accounts is as follows: 401 Adams Avenue, Suite 280, Montgomery, Alabama 36104. If the disclosure statement is filed with a contract, the awarding entity should include a copy with the contract when it is presented to the Contract Review Permanent Legislative Oversight Committee.

Pursuant to Section 41-16-84 (b), *Code of Alabama* 1975 the State of Alabama shall not enter into any contract or appropriate any public funds with any person who refuses to provide information as required.

Pursuant to Section 41-16-86, *Code of Alabama* 1975, any person who knowingly provides misleading or incorrect information on the disclosure statement shall be subject to a civil penalty of ten percent (10%) of the amount of the transaction, not to exceed \$10,000.00. Also, the contract or grant shall be voidable by the awarding entity.

### **Definitions as Provided in Section 41-16-81, Code of Alabama 1975**

- (1) **Family Member of a Public Employee** – The spouse or a dependent of the public employee.
- (2) **Family Member of a Public Official** – The spouse, a dependent, an adult child and his or her spouse, a parent, a spouse's parents, or a sibling and his or her spouse, of the public official.
- (3) **Family Relationship** – A person has a family relationship with a public official or public employee if the person is a family member of the public official or public employee.
- (4) **Person** – An individual, firm, partnership, association, joint venture, cooperative, or corporation, or any other group or combination acting in concert.
- (5) **Public Official and Public Employee** - These terms shall have the same meanings ascribed to them in Sections 36-25-1(26) and 36-25-1(27), *Code of Alabama* 1975, (see below) except for the purposes of the disclosure requirements of this article, the terms shall only include persons in a position to influence the awarding of a grant or contract who are affiliated with the awarding entity. Notwithstanding the foregoing, these terms shall also include the Governor, Lieutenant Governor, members of the cabinet of the Governor, and members of the Legislature. (Note: The definitions for public official and public employee are now denoted as Sections 36-25-1 (26) and 36-25-1 (27), *Code of Alabama* 1975. However, Section 41-16-81 (5), *Code of Alabama* 1975 has not been codified to reflect such updates.)

Section 36-25-1(26), *Code of Alabama* 1975, defines a **public employee** as any person employed at the state, county or municipal level of government or their instrumentalities, including governmental corporations and authorities, but excluding employees of hospitals or other health care corporations including contract employees of those hospitals or other health care corporations, who is paid in whole or in part from state, county, or municipal funds. For purposes of this chapter, a public employee does not include a person employed on a part-time basis whose employment is limited to providing professional services other than lobbying, the compensation for which constitutes less than 50 percent of the part-time employee's income.

Section 36-25-1(27), *Code of Alabama* 1975, defines a **public official** as any person elected to public office, whether or not that person has taken office, by the vote of the people at state, county, or municipal level of government or their instrumentalities, including governmental corporations, and any person appointed to a position at the state, county, or municipal level of government or their instrumentalities, including governmental corporations. For purposes of this chapter, a public official includes the chairs and vice-chairs or the equivalent offices of each state political party as defined in Section 17-13-40, *Code of Alabama* 1975.

### **Instructions**

Complete all lines as indicated. If an item does not apply, denote N/A (not applicable). If you cannot include required information in the space provided, attach additional sheets as necessary.

**THE DISCLOSURE STATEMENT MUST BE SIGNED, DATED, AND NOTARIZED PRIOR TO SUBMISSION.**



Kay Ivey  
Governor

Bill Poole  
Director of Finance

STATE OF ALABAMA  
DEPARTMENT OF FINANCE  
REAL PROPERTY MANAGEMENT  
Division of Construction Management

P.O. Box 301150, Montgomery, AL 36130-1150  
770 Washington Avenue, Suite 444, Montgomery, AL 36104  
Telephone: (334) 242-4082 Fax: (334) 242-4182



Mickey Allen  
Assistant Finance Director  
Real Property Management

Frank Barnes, Director  
Construction Management

## E-Verify Memorandum of Understanding

Instructions for inclusion in project manuals.

Per DCM's May 29, 2012 bulletin *Guidance on Act 2012-491 Amending the Alabama Immigration Law*: "Contractors (including architects and engineers) will ... be required to enroll in the E-Verify program and to provide documentation of enrollment in the E-Verify program with their contracts or agreements."

Upon completing enrollment in the E-Verify program available at <https://www.e-verify.gov/employers/enrolling-in-e-verify>, an E-Verify Memorandum of Understanding (MOU) is issued to the enrolled business. The same E-Verify MOU can be repeatedly used until any information in the business's E-Verify user profile is updated, at which time E-Verify updates the printable Company Information section of the MOU, while the original signatory information remains the same. Typically, an E-Verify MOU is 13-18 pages long depending on business type and number of employees.

**DCM requires a copy of the entire current E-Verify MOU document including the completed Department of Homeland Security – Verification Division section (with name, signature and date included) to be submitted as an attachment to each Construction Contract original and to each Agreement Between Owner and Architect original.**



STATE OF ALABAMA  
BUILDING COMMISSION

770 WASHINGTON AVE  
SUITE 444  
Montgomery, Alabama 36130-1150  
Telephone: (334) 242-4082  
Fax: (334) 242-4182

Robert Bentley  
Governor

Katherine Lynn  
Director

May 29, 2012

**TO: ARCHITECTS AND ENGINEERS**

**FROM: KATHERINE LYNN, DIRECTOR**  
**ALABAMA BUILDING COMMISSION**  
*Katherine Lynn*

**SUBJECT: GUIDANCE ON ACT 2012-491 AMENDING THE ALABAMA IMMIGRATION LAW**

The Alabama Immigration Law (also referred to as "Act 2011-535" and codified in state law as Title 31, Chapter 13 of the Code of Alabama 1975) was amended by Act No. 2012-491 which was signed by Governor Bentley on May 18, 2012. Upon signature, the following requirements went into effect:

1. Contractors (including architects and engineers) will no longer be required to provide an affidavit nor will they be required to obtain affidavits from their subcontractors or consultants.
2. Contractors (including architects and engineers) will still be required to enroll in the E-Verify program and to provide documentation of enrollment in the E-Verify program with their contracts or agreements.
3. All contracts and agreements must now include the following statement:

***By signing this contract, the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the state of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.***

The departments that have previously issued guidance on compliance may revise their guidance based on Act No. 2012-491. Architects, engineers and contractors are urged to continue checking the websites for the State Department of Education, the Alabama Community College System and State Comptroller's Office for the latest information.

To aid in compliance, any contract received at the Building Commission after May 18, 2012 that does not include the required contract clause and E-Verify Memorandum of Understanding will be returned.

The websites for each department include their points of contact for questions or you may contact me at (334) 242-4082.

Cc: Mr. Perry Taylor, State School Architect  
Ms. Lynne Thrower, General Counsel/Vice Chancellor, Legal and Human Resources  
Mr. Thomas White, Jr., State Comptroller

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## REVISED

### Alabama Immigration Law Guidance for School Boards

The Beason-Hammon Alabama Taxpayer and Citizen Protection Act (Act No. 2011-535) includes several sections that affect the financial operations of Alabama school boards. Legislation amending certain sections of Act No. 2011-535 has been signed by Governor Bentley and is available on the Secretary of State's web page as **Act No. 2012-491**. [Act 2011-535 is codified in state laws as **Title 31, Chapter 13** of the Code of Alabama 1975.]

- A.** Effective April 1, 2012, every business entity or employer in Alabama is required to enroll in E-Verify and follow the related federal law and regulations for verifying the employment eligibility of newly hired employees using the E-Verify program. [See Section 31-13-15(b)].
- B.** Two other sections of the law require business entities and employers with one or more employees working in Alabama to utilize the E-Verify program for newly hired employees as a condition of a contract, grant, or incentive awarded by a public entity on or after January 1, 2012. [See Section 31-13-9(a) & (b) and Section 31-13-25(b)].

**A. *Employees.*** After enrolling in the federal E-Verify program, the school board is required to verify the immigration status of a newly hired employee (including a substitute employee) as part of the employment process by utilizing the E-Verify program. School boards are prohibited by federal laws from using E-Verify to pre-screen potential employees. However, school boards may inform applicants and potential employees that the school board now uses the federal E-Verify program for newly hired employees by providing the following notification:

Alabama school boards are required by state law to verify the employment eligibility of newly hired employees by using the federal E-Verify program. New employees are required to provide a Social Security number, an unexpired identity document that contains a photograph, and other acceptable documents that establish employment eligibility. In addition to determining whether a new hire is authorized to work in the United States, E-Verify will confirm that the employee's name and Social Security number match. The U. S. Department of Homeland Security (DHS) has a service for employees to check their own employment authorization status before going through the E-Verify process at a new job. The E-Verify Self Check gives new employees some additional time to correct any problems they find with their DHS or Social Security Administration records before employment begins. Self Check is located on the right side of the E-Verify web site [www.uscis.gov/everify](http://www.uscis.gov/everify).

**B. *Contracts.*** Effective January 1, 2012, when the school board awards a contract or grant to a business entity or employer (that has one or more employees working in Alabama), Section 31-13-9(a) requires that the school board obtain a notarized affidavit and documentation of enrollment in the E-Verify program. **Act No. 2012-491 removed the affidavit requirement and now defines the term "contract" as "...a contract awarded by the state, any political subdivision thereof, or any state-funded entity that was competitively bid..."**

**B. Contracts (continued).** Business entities or employers with one or more employees working in Alabama should be notified of the requirements to enroll in the E-Verify program before the contract is signed or bids are awarded. The E-Verify documentation may not be necessary for some contracts awarded by the school board because the contracting entity does not have any employees working in Alabama. The law does not address the documentation required in these situations. A letter, fax, e-mail, or some type of documentation should be obtained from the business entity or employer stating that the contracting entity does not have any employees working in Alabama.

State law does not require that bid specifications include specific language addressing the requirements of the Beason-Hammon Alabama Taxpayer and Citizen Protection Act. However, including the immigration requirements in the bid specifications would be beneficial in approving the contract after the bid is awarded. Including the following language in bid specifications could avoid questions from potential bidders:

Alabama laws require that, as a condition for the award of a contract by a school board to a business entity or employer with one or more employees working in Alabama, the business entity or employer must provide documentation of enrollment in the E-Verify program. During the performance of the contract, the business entity or employer shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. The contractor's E-Verify Memorandum of Understanding must be included with the bid. If you do not believe these requirements are applicable to your entity, include an explanation justifying such exemption. An entity can obtain the E-Verify Memorandum of Understanding upon completion in the E-Verify enrollment process located at the federal web site [www.uscis.gov/everify](http://www.uscis.gov/everify). The Alabama Department of Homeland Security (<http://immigration.alabama.gov>) has also established an E-Verify employer agent account for any business entity or employer with 25 or fewer employees that will provide a participating business entity or employer with the required documentation of enrollment in the E-Verify program. An Employer Identification Number (EIN), also known as a Federal Tax Identification Number, is required to enroll in E-Verify or to establish an E-Verify employer agent account.

Act No. 2012-491 now requires school boards to include the following clause in all contracts or agreements: ***"By signing this contract, the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the state of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom."***

The amended law also changed the definition of SUBCONTRACTOR to "A person, business entity, or employer who is awarded a portion of an existing contract by a contractor, regardless of its tier." Another provision states, "Furthermore, during the performance of the contract, the subcontractor shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. This subsection shall only apply to subcontractors performing work on a project subject to the provisions of this section and not to collateral persons or business entities hired by the subcontractor."



STATE OF ALABAMA  
DEPARTMENT OF FINANCE  
REAL PROPERTY MANAGEMENT  
Division of Construction Management



Kay Ivey  
Governor  
  
Kelly Butler  
Director of Finance

P.O. Box 301150, Montgomery, AL 36130-1150  
770 Washington Avenue, Suite 444, Montgomery, AL 36104  
Telephone: (334) 242-4082 Fax: (334) 242-4182

Mickey Allen  
Assistant Finance Director  
Real Property Management  
  
Frank Barnes, Director  
Construction Management

January 19, 2021

**TO: ARCHITECTS, ENGINEERS, AND CONTRACTORS**

**FROM: MICKEY ALLEN, ASSISTANT FINANCE DIRECTOR** *m Allen*  
**ALABAMA REAL PROPERTY MANAGEMENT (RPM)**

**FRANK BARNES, DIRECTOR**  
**ALABAMA DIVISION OF CONSTRUCTION MANAGEMENT (DCM)** *Frank Barnes*

**SUBJECT: UPDATED GUIDANCE ON FIRE ALARM CONTRACTOR PERMITS**

DCM's July 17, 2012 *Memorandum On Act 2009-657 Requiring Certification Of Fire Alarm Contractors* is superseded by this January 19, 2021 bulletin which includes updated references, terms, and details for projects under DCM's jurisdiction.

Act 2009-657, effective August 1, 2012, requires fire alarm contractors to be permitted through the State of Alabama Fire Marshal's Office. In accordance with §34-33A-9, if a fire alarm contractor is going to do work in Alabama, the contractor must deliver to the local building official a copy of their State Fire Marshal's Fire Alarm Permit. DCM requires the following:

**Plan Review**

For work involving fire alarm systems in Optional 65% Intermediate Plan Review submittals and in Final Plan Review submittals, the requirement for a fire alarm contractor to be permitted through the State of Alabama Fire Marshal's Office shall be included on plan notes and/or in the project manual.

**Bidding**

Pursuant to §34-33A-11(b), for work involving fire alarm systems, General Contractors must submit a copy of the fire alarm contractor's State Fire Marshal's Fire Alarm Permit at the same time as submission of the subcontractor and supplier list to the lead design professional, which is required within 24 hours after receipt of bids. The architect or engineer shall reject fire alarm contractors who cannot provide a copy of the required permit.

**Pre-Construction Conference**

For work involving fire alarm systems, General Contractors must provide a copy of the fire alarm contractor's State Fire Marshal's Fire Alarm Permit to the DCM Inspector at the pre-construction conference.

If you have any questions, please contact DCM's Plan Review Division at 334-242-4082 or [planreview@realproperty.alabama.gov](mailto:planreview@realproperty.alabama.gov).

cc: Scott Pilgreen, Alabama State Fire Marshal, State of Alabama Fire Marshal's Office.



ROBERT BENTLEY  
GOVERNOR

**STATE OF ALABAMA  
DEPARTMENT OF INSURANCE**

State Fire Marshal's Office  
201 Monroe Street, Suite 1790  
Post Office Box 303352  
Montgomery, Alabama 36130-3352  
Telephone: (334) 241-4166  
Facsimile: (334) 241-4158  
Internet: [www.firemarshal.alabama.gov](http://www.firemarshal.alabama.gov)

JIM L. RIDLING  
COMMISSIONER

EDWARD S. PAULK  
STATE FIRE MARSHAL

**MAILING ADDRESS:**

P.O. BOX 303352  
MONTGOMERY, AL 36130-3352

**OVERNIGHT ADDRESS:**

201 MONROE STREET, SUITE 1790  
MONTGOMERY, AL 36104  
**PLEASE USE FEDEX, UPS OR DHL**

**APPLICATION FOR STATE FIRE MARSHAL'S CERTIFIED FIRE ALARM CONTRACTOR PERMIT**

**PLEASE PRINT OR TYPE**

In compliance with Sections 34-33A-1 to 34-33A-13, Code of Alabama, 1975, I hereby apply for a State Fire Marshal's Permit to engage in the installation, repair, alteration, maintenance, or inspection of fire alarm systems in Alabama.

CERTIFICATE HOLDER'S NAME: \_\_\_\_\_

CERTIFICATE HOLDERS SSN: \_\_\_\_\_ DOB: \_\_\_\_\_

NAME OF BUSINESS: \_\_\_\_\_

BUSINESS OWNER NAME: \_\_\_\_\_

BUSINESS OWNER SSN: \_\_\_\_\_ DOB: \_\_\_\_\_ ARE YOU A U.S. CITIZEN? ☐ YES ☐ NO

BUSINESS ADDRESS: \_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_

BUSINESS TELEPHONE: \_\_\_\_\_ PERMIT TYPE: INITIAL ☐ RENEWAL ☐  
Current Permit # \_\_\_\_\_

This is to certify that \_\_\_\_\_ (certificate holder) is presently employed by \_\_\_\_\_ (business) in the capacity of \_\_\_\_\_ (title) and is authorized to act for the business in all matters pertaining to the installation, repair, alteration, addition, maintenance, or inspection of fire alarm systems in the state of Alabama.

If for any reason the certificate holder terminates employment with the above business, we the undersigned, do understand that the State Fire Marshal's Office is to be notified within thirty (30) days, and that the business will have nine (9) months or until expiration of the current permit, whichever comes first, to submit an application on a new certificate holder and be issued a new permit.

I the undersigned do certify that the information provided above is true and correct. I the undersigned do understand that submission of false information is grounds for license revocation and may subject me to criminal penalties.

Owner/President Signature \_\_\_\_\_ Date \_\_\_\_\_ Certificate Holder Signature \_\_\_\_\_ Date \_\_\_\_\_

INITIAL/RENEWAL FEE \$100.00

INCLUDE FEE WHEN SUBMITTING APPLICATION. (CHECK OR MONEY ORDER MADE PAYABLE TO THE STATE FIRE MARSHAL'S FUND.)  
INCLUDE COPY OF NICET CERTIFICATION CARD (CURRENT) FOR FIRE ALARM SYSTEM TECHNICIAN - LEVEL III.

## **CERTIFIED FIRE ALARM CONTRACTOR ATTACHMENT**

1. Home address of the NICET Certificate holder:

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
City State Zip Code

\_\_\_\_\_  
Phone Number (this is the number you can be reached at)

2. Are you a United States Citizen? \_\_\_\_ YES \_\_\_\_ NO
3. I understand as the NICET Certificate holder for this company that I am licensed only by this company and no other company within the Fire Alarm Industry.
4. I understand as the NICET Certificate holder for this company that I am responsible for the layout, installation, maintenance, repair or alterations performed by this company.

\_\_\_\_\_  
Signature of NICET Certificate holder

\_\_\_\_\_  
Date

Numbers in margin correspond to second page of "Checklist", DCM Form B-7

(1) **PERFORMANCE BOND**

*Do not staple this form; use clips.*

SURETY'S BOND NUMBER

(2) The **PRINCIPAL** (*Company name and address of Contractor as appears in the Construction Contract*)

Name:

Address:

(3) The **SURETY** (*Company name and primary place of business*)

Name:

Address:

(4) The **OWNER** (*Entity name and address, same as appears in the Construction Contract*)

Name:

Address:

(5) The **PENAL SUM** of this Bond (the Contract Sum)

Dollars (\$) ).

(6) **DATE** of the Construction Contract :

(7) The **PROJECT**: (*Same as appears in the Construction Contract*)

1. **WE, THE PRINCIPAL (hereinafter "Contractor") AND THE SURETY**, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the Penal Sum stated above for the performance of the Contract, and Contract Change Orders, in accord with the requirements of the Contract Documents, which are incorporated herein by reference. If the Contractor performs the Contract, and Contract Change Orders, in accordance with the Contract Documents, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

2. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. All Contract Change Orders involving an increase in the Contract Sum will require consent of Surety by endorsement of the Contract Change Order form. The Surety waives notification of any Contract Change Orders involving only extension of the Contract Time.

3. Whenever the Architect gives the Contractor and the Surety, at their addresses stated above, a written Notice to Cure a condition for which the Contract may be terminated in accordance with the Contract Documents, the Surety may, within the time stated in the notice, cure or provide the Architect with written verification that satisfactory positive action is in process to cure the condition.
4. The Surety's obligation under this Bond becomes effective after the Contractor fails to satisfy a Notice to Cure and the Owner:
  - (a) gives the Contractor and the Surety, at their addresses stated above, a written Notice of Termination declaring the Contractor to be in default under the Contract and stating that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the notice; and
  - (b) gives the Surety a written demand that, upon the effective date of the Notice of Termination, the Surety promptly fulfill its obligation under this Bond.
5. In the presence of the conditions described in Paragraph 4, the Surety shall, at its expense:
  - (a) On the effective date of the Notice of Termination, take charge of the Work and be responsible for the safety, security, and protection of the Work, including materials and equipment stored on and off the Project site, and
  - (b) Within twenty-one days after the effective date of the Notice of Termination, proceed, or provide the Owner with written verification that satisfactory positive action is in process to facilitate proceeding promptly, to complete the Work in accordance with the Contract Documents, either with the Surety's resources or through a contract between the Surety and a qualified contractor to whom the Owner has no reasonable objection.
6. As conditions precedent to taking charge of and completing the Work pursuant to Paragraph 5, the Surety shall neither require, nor be entitled to, any agreements or conditions other than those of this Bond and the Contract Documents. In taking charge of and completing the Work, the Surety shall assume all rights and obligations of the Contractor under the Contract Documents; however, the Surety shall also have the right to assert "Surety Claims" to the Owner in accordance with the Contract Documents. The presence or possibility of a Surety Claim shall not be just cause for the Surety to fail or refuse to promptly take charge of and complete the Work or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.
7. By accepting this Bond as a condition of executing the Construction Contract, and by taking the actions described in Paragraph 4, the Owner agrees that:
  - (a) the Owner shall promptly advise the Surety of the unpaid balance of the Contract Sum and, upon request, shall make available or furnish to the Surety, at the cost of reproduction, any portions of the Project Record, and
  - (b) as the Surety completes the Work, or has it completed by a qualified contractor, the Owner shall pay the Surety, in accordance with terms of payment of the Contract Documents, the unpaid balance of the Contract Sum, less any amounts that may be or become due the Owner from the Contractor under the Construction Contract or from the Contractor or the Surety under this Bond.
8. In the presence of the conditions described in Paragraph 4, the Surety's obligation includes responsibility for the correction of Defective Work, liquidated damages, and reimbursement of any reasonable expenses incurred by the Owner as a result of the Contractor's default under the Contract, including architectural, engineering, administrative, and legal services.

Numbers in margin correspond to second page of "Checklist", DCM Form B-7

9. Nothing contained in this Bond shall be construed to mean that the Surety shall be liable to the Owner for an amount exceeding the Penal Sum of this Bond, except in the event that the Surety should be in default under the Bond by failing or refusing to take charge of and complete the Work pursuant to Paragraph 5. If the Surety should fail or refuse to take charge of and complete the Work, the Owner shall have the authority to take charge of and complete the Work, or have it completed, and the following costs to the Owner, less the unpaid balance of the Contract Sum, shall be recoverable under this Bond:
- (a) the cost of completing the Contractor's responsibilities under the Contract, including correction of Defective Work;
  - (b) additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees incident to completing the Work;
  - (c) interest on, and the cost of obtaining, funds to supplement the unpaid balance of the Contract Sum as may be necessary to cover the foregoing costs;
  - (d) the fair market value of any reductions in the scope of the Work necessitated by insufficiency of the unpaid balance of the Contract Sum and available supplemental funds to cover the foregoing costs; and
  - (f) additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees incident to ascertaining and collecting the Owner's losses under the Bond.
10. All claims and disputes arising out of or related to this bond, or its breach, shall be resolved in accordance with Article 24, General Conditions of the Contract.

(8) **SIGNED AND SEALED** this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

(9 & 10) **SURETY:**

**CONTRACTOR as PRINCIPAL:**

\_\_\_\_\_  
Company Name

By \_\_\_\_\_  
Signature

\_\_\_\_\_  
Name and Title

\_\_\_\_\_  
Company Name

By \_\_\_\_\_  
Signature

\_\_\_\_\_  
Name and Title

- (11) **NOTE:** Original power of attorney for the Surety's signatory shall be furnished with each of the original six bond forms to be attached to each of the six contract forms per project.

Do not staple this form; use clips. Purpose: quickly and efficiently scan thousands of documents into DCM's database.



Numbers in margin correspond to second page of "Checklist", DCM Form B-7

(1) **PAYMENT BOND**

SURETY'S BOND NUMBER

*Do not staple this form; use clips.*

- (2) The **PRINCIPAL** (Company name and address of Contractor, same as appears in the Construction Contract)

Name:

Address:

- (3) The **SURETY** (Company name and primary place of business)

Name:

Address:

- (4) The **OWNER(s)** (Entity name and address, same as appears in the Construction Contract)

Name:

Address:

- (5) The **PENAL SUM** of this Bond (the Contract Sum)

Dollars (\$) ).

- (6) **DATE** of the Construction Contract:

- (7) The **PROJECT**: (Same as appears in the Construction Contract)

1. **WE, THE PRINCIPAL** (hereinafter "Contractor") **AND THE SURETY**, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the Penal Sum stated above to promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract, which is incorporated herein by reference, and any modifications thereof by Contract Change Orders. If the Contractor and its Subcontractors promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract and Contract Change Orders, then this obligation shall be null and void; otherwise to remain and be in full force and effect.
2. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. All Contract Change Orders involving an increase in the Contract Sum will require consent of Surety by endorsement of the Contract Change Order form. The Surety waives notification of any Contract Change Orders involving only extension of the Contract Time.

Numbers in margin correspond to second page of "Checklist", DCM Form B-7

3. Any person that has furnished labor, materials, or supplies for or in the prosecution of the Contract and Contract Change Orders for which payment has not been timely made may institute a civil action upon this Bond and have their rights and claims adjudicated in a civil action and judgment entered thereon. Notwithstanding the foregoing, a civil action may not be instituted on this bond until 45 days after written notice to the Surety of the amount claimed to be due and the nature of the claim. The civil action must commence not later than one year from the date of final settlement of the Contract. The giving of notice by registered or certified mail, postage prepaid, addressed to the Surety at any of its places of business or offices shall be deemed sufficient. In the event the Surety or Contractor fails to pay the claim in full within 45 days from the mailing of the notice, then the person or persons may recover from the Contractor and Surety, in addition to the amount of the claim, a reasonable attorney's fee based on the result, together with interest on the claim from the date of the notice.
4. Every person having a right of action on this bond shall, upon written application to the Owner indicating that labor, material, or supplies for the Work have been supplied and that payment has not been made, be promptly furnished a certified copy of this bond and the Construction Contract. The claimant may bring a civil action in the claimant's name on this Bond against the Contractor and the Surety, or either of them, in the county in which the Work is to be or has been performed or in any other county where venue is otherwise allowed by law.
5. This bond is furnished to comply with Code of Alabama, §39-1-1, and all provisions thereof shall be applicable to civil actions upon this bond.
6. All claims and disputes between Owner and either the Contractor or Surety arising out of or related to this bond, or its breach, shall be resolved in accordance with Article 24, General Conditions of the Contract.

(8) **SIGNED AND SEALED** this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

(9 & 10) **SURETY:**

**CONTRACTOR as PRINCIPAL:**

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Company Name

By \_\_\_\_\_  
Signature

By \_\_\_\_\_  
Signature

\_\_\_\_\_  
Name and Title

\_\_\_\_\_  
Name and Title

- (11) **NOTE:** Original power of attorney for the Surety's signatory shall be furnished with each of the original six bond forms to be attached to each of the six contract forms per project.

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# GENERAL CONDITIONS of the CONTRACT

## CONTENTS

1. Definitions
2. Intent and Interpretation of the Contract Documents
3. Contractor's Representation
4. Documents Furnished to Contractor
5. Ownership of Drawings
6. Supervision, Superintendent, & Employees
7. Review of Contract Documents and Field Conditions by Contractor
8. Surveys by Contractor
9. Submittals
10. Documents and Samples at the Site
11. "As-built" Documents
12. Progress Schedule
13. Materials, Equipment & Substitutions
14. Safety & Protection of Persons & Property
15. Hazardous Materials
16. Inspection of the Work
17. Correction of Work
18. Deductions for Uncorrected Work
19. Changes in the Work
20. Claims for Extra Cost or Extra Work
21. Differing Site Conditions
22. Claims for Damages
23. Delays
24. Resolution of Claims and Disputes
25. Owner's Right to Correct Work
26. Owner's Right to Stop or Suspend the Work
27. Owner's Right to Terminate Contract
28. Contractor's Right to Suspend or Terminate
29. Progress Payments
30. Certification & Approvals for Payments
31. Payments Withheld
32. Substantial Completion
33. Occupancy or Use Prior to Completion
34. Final Payment
35. Contractor's Warranty
36. Indemnification Agreement
37. Insurance
38. Performance and Payment Bonds
39. Assignment
40. Construction by Owner or Separate Contracts
41. Subcontracts
42. Architect's Status
43. Cash Allowances
44. Permits, Laws and Regulations
45. Royalties, Patents and Copyrights
46. Use of the Site
47. Cutting and Patching
48. In-progress and Final Cleanup
49. Liquidated Damages
50. Use of Foreign Material
51. Sign

## ARTICLE 1 DEFINITIONS

Whenever the following terms, or pronouns in place of them, are used in the Contract Documents, the intent and meaning shall be interpreted as follows:

- A. ALABAMA DIVISION OF CONSTRUCTION MANAGEMENT:** The Technical Staff of the Alabama Division of Construction Management.
- B. ARCHITECT:** The Architect is the person or entity lawfully licensed to practice architecture in the State of Alabama, who is under contract with the Owner as the primary design professional for the Project and identified as the Architect in the Construction Contract. The term "Architect" means the Architect or the Architect's authorized representative. If the employment of the Architect is terminated, the Owner shall employ a new Architect whose status under the Contract Documents shall be that of the former Architect. If the primary design professional for the Project is a Professional Engineer, the term "Engineer" shall be substituted for the term "Architect" wherever it appears in this document.

- C. COMMISSION:** The former Alabama Building Commission, for which the Alabama Division of Construction Management has been designated by the Legislature as its successor.
- D. CONTRACT:** The Contract is the embodiment of the Contract Documents. The Contract represents the entire and integrated agreement between the Owner and Contractor and supersedes any prior written or oral negotiations, representations or agreements that are not incorporated into the Contract Documents. The Contract may be amended only by a Contract Change Order or a Modification to the Construction Contract. The contractual relationship which the Contract creates between the Owner and the Contractor extends to no other persons or entities. The Contract consists of the following Contract Documents, including all additions, deletions, and modifications incorporated therein before the execution of the Construction Contract:
- (1) Construction Contract
  - (2) Performance and Payment Bonds
  - (3) Conditions of the Contract (General, Supplemental, and other Conditions)
  - (4) Specifications
  - (5) Drawings
  - (6) Contract Change Orders
  - (7) Modifications to the Construction Contract (applicable to PSCA Projects)
- E. CONTRACT SUM:** The Contract Sum is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The term “Contract Sum” means the Contract Sum stated in the Construction Contract as may have been increased or decreased by Change Order(s) in accordance with the Contract Documents.
- F. CONTRACT TIME:** The Contract Time is the period of time in which the Contractor must achieve Substantial Completion of the Work. The date on which the Contract Time begins is specified in the written Notice To Proceed issued to the Contractor by the Owner or Director. The Date of Substantial Completion is the date established in accordance with Article 32. The term “Contract Time” means the Contract Time stated in the Construction Contract as may have been extended by Change Order(s) in accordance with the Contract Documents. The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.
- G. CONTRACTOR:** The Contractor is the person or persons, firm, partnership, joint venture, association, corporation, cooperative, limited liability company, or other legal entity, identified as such in the Construction Contract. The term “Contractor” means the Contractor or the Contractor’s authorized representative.
- H. DCM:** The Alabama Division of Construction Management.
- I. DCM PROJECT INSPECTOR:** The member of the Technical Staff of the Alabama Division of Construction Management to whom the Project is assigned relative to executing the respective inspections and authorities described in Article 16, Inspection of the Work.
- J. DEFECTIVE WORK:** The term “Defective Work” shall apply to: (1) any product, material, system, equipment, or service, or its installation or performance, which does not conform to the requirements of the Contract Documents, (2) in-progress or completed Work the workmanship of which does not conform to the quality specified or, if not specified, to the quality produced by skilled workers performing work of a similar nature on similar projects in the state, (3) substitutions and deviations not properly submitted and approved or otherwise authorized, (4) temporary

supports, structures, or construction which will not produce the results required by the Contract Documents, and (5) materials or equipment rendered unsuitable for incorporation into the Work due to improper storage or protection.

- K. DIRECTOR:** The Director of the Alabama Division of Construction Management.
- L. DRAWINGS:** The Drawings are the portions of the Contract Documents showing graphically the design, location, layout, and dimensions of the Work, in the form of plans, elevations, sections, details, schedules, and diagrams.
- M. NOTICE TO PROCEED:** A proceed order issued by the Owner or Director, as applicable, fixing the date on which the Contractor shall begin the prosecution of the Work, which is also the date on which the Contract Time shall begin.
- N. OWNER:** The Owner is the entity or entities identified as such in the Construction Contract and is referred to throughout the Contract Documents as if singular in number. The term “Owner” means the Owner or the Owner’s authorized representative. The term “Owner” as used herein shall be synonymous with the term “Awarding Authority” as defined and used in Title 39 - Public Works, Code of Alabama, 1975, as amended.
- O. THE PROJECT:** The Project is the total construction of which the Work required by these Contract Documents may be the entirety or only a part with other portions to be constructed by the Owner or separate contractors.
- P. PROJECT MANUAL:** The Project Manual is the volume usually assembled for the Work which may include the Advertisement for Bids, Instructions to Bidders, sample forms, General Conditions of the Contract, Supplementary Conditions, and Specifications of the Work.
- Q. SPECIFICATIONS:** The Specifications are that portion of the Contract Documents which set forth in writing the standards of quality and performance of products, equipment, materials, systems, and services and workmanship required for acceptable performance of the Work.
- R. SUBCONTRACTOR:** A Subcontractor is a person or entity who is undertaking the performance of any part of the Work by virtue of a contract with the Contractor. The term “Subcontractor” means a Subcontractor or its authorized representatives.
- S. THE WORK:** The Work is the construction and services required by the Contract Documents and includes all labor, materials, supplies, equipment, and other items and services as are necessary to produce the required construction and to fulfill the Contractor’s obligations under the Contract. The Work may constitute the entire Project or only a portion of it.

## **ARTICLE 2**

### **INTENT and INTERPRETATION of the CONTRACT DOCUMENTS**

#### **A. INTENT**

It is the intent of the Contract Documents that the Contractor shall properly execute and complete the Work described by the Contract Documents, and unless otherwise provided in the Contract, the

Contractor shall provide all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work, in full accordance with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**B. COMPLEMENTARY DOCUMENTS**

The Contract Documents are complementary. If Work is required by one Contract Document, the Contractor shall perform the Work as if it were required by all of the Contract Documents. However, the Contractor shall be required to perform Work only to the extent that is consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**C. ORDER of PRECEDENCE**

Should any discrepancy arise between the various elements of the Contract Documents, precedence shall be given to them in the following order unless to do so would contravene the apparent Intent of the Contract Documents stated in preceding Paragraph A:

- (1) The Construction Contract.
- (2) Addenda, with those of later date having precedence over those of earlier date.
- (3) Supplementary Conditions (or other Conditions which modify the General Conditions of the Contract).
- (4) General Conditions of the Contract.
- (5) The Specifications.
- (6) Details appearing on the Drawings; large scale details shall take precedence over smaller scale details.
- (7) The Drawings; large scale drawings shall take precedence over smaller scale drawings.

**D. ORGANIZATION**

Except as may be specifically stated within the technical specifications, neither the organization of the Specifications into divisions, sections, or otherwise, nor any arrangement of the Drawings shall control how the Contractor subcontracts portions of the Work or assigns Work to any trade.

**E. INTERPRETATION**

(1) The Contract Documents shall be interpreted collectively, each part complementing the others and consistent with the Intent of the Contract Documents stated in preceding Paragraph A. Unless an item shown or described in the Contract Documents is specifically identified to be furnished or installed by the Owner or others or is identified as "Not In Contract" ("N.I.C."), the Contractor's obligation relative to that item shall be interpreted to include furnishing, assembling, installing, finishing, and/or connecting the item at the Contractor's expense to produce a product or system that is complete, appropriately tested, and in operative condition ready for use or subsequent construction or operation of the Owner or separate contractors. The omission of words or phrases for brevity of the Contract Documents, the inadvertent omission of words or phrases, or obvious typographical or written errors shall not defeat such interpretation as long as it is reasonably inferable from the Contract Documents as a whole.

(2) Words or phrases used in the Contract Documents which have well-known technical or

construction industry meanings are to be interpreted consistent with such recognized meanings unless otherwise indicated.

(3) Except as noted otherwise, references to standard specifications or publications of associations, bureaus, or organizations shall mean the latest edition of the referenced standard specification or publication as of the date of the Advertisement for Bids.

(4) In the case of inconsistency between Drawings and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

(5) Any portions of the Contract Documents written in longhand must be initialed by all parties..

(6) Any doubt as to the meaning of the Contract Documents or any obscurity as to the wording of them, shall be promptly submitted in writing to the Architect for written interpretation, explanation, or clarification.

**F. SEVERABILITY.**

The partial or complete invalidity of any one or more provision of this Contract shall not affect the validity or continuing force and effect of any other provision.

**ARTICLE 3**  
**CONTRACTOR'S REPRESENTATIONS**

By executing the Construction Contract the Contractor represents to the Owner:

- A. The Contractor has visited the site of the Work to become familiar with local conditions under which the Work is to be performed and to evaluate reasonably observable conditions as compared with requirements of the Contract Documents.
- B. The Contractor shall use its best skill and attention to perform the Work in an expeditious manner consistent with the Contract Documents.
- C. The Contractor is an independent contractor and in performance of the Contract remains and shall act as an independent contractor having no authority to represent or obligate the Owner in any manner unless authorized by the Owner in writing.

**ARTICLE 4**  
**DOCUMENTS FURNISHED to CONTRACTOR**

Unless otherwise provided in the Contract Documents, twenty sets of Drawings and Project Manuals will be furnished to the Contractor by the Architect without charge. Other copies requested will be furnished at reproduction cost.

**ARTICLE 5**  
**OWNERSHIP of DRAWINGS**

All original or duplicated Drawings, Specifications, and other documents prepared by the Architect, and furnished to the Contractor are the property of the Architect and are to be used solely for this Project and not to be used in any manner for other work. Upon completion of the Work, all copies of Drawings and Specifications, with the exception of the Contractor's record set, shall be returned or accounted for by the Contractor to the Architect, on request.

**ARTICLE 6**  
**SUPERVISION, SUPERINTENDENT, and EMPLOYEES**

**A. SUPERVISION and CONSTRUCTION METHODS**

- (1) The term "Construction Methods" means the construction means, methods, techniques, sequences, and procedures utilized by the Contractor in performing the Work. The Contractor is solely responsible for supervising and coordinating the performance of the Work, including the selection of Construction Methods, unless the Contract Documents give other specific instructions concerning these matters.
- (2) The Contractor is solely and completely responsible for job site safety, including the protection of persons and property in accordance with Article 14.
- (3) The Contractor shall be responsible to the Owner for acts and omissions of not only the Contractor and its agents and employees, but all persons and entities, and their agents and employees, who are performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.
- (4) The Contractor shall be responsible to inspect the in-progress and completed Work to verify its compliance with the Contract Documents and to insure that any element or portion of the Work upon which subsequent Work is to be applied or performed is in proper condition to receive the subsequent Work.

**B. SUPERINTENDENT**

- (1) The Contractor shall employ and maintain a competent level of supervision for the performance of the Work at the Project site, including a superintendent who shall:
  - (a) have full authority to receive instructions from the Architect or Owner and to act on those instructions and
  - (b) be present at the Project site at all times during which Work is being performed.
- (2) Before beginning performance of the Work, the Contractor shall notify the Architect in writing of the name and qualifications of its proposed superintendent so that the Owner may review the individual's qualifications. If, for reasonable cause, the Owner refuses to approve the individual, or withdraws its approval after once giving it, the Contractor shall name a different superintendent for the Owner's review and approval. Any disapproved superintendent will not perform in that capacity thereafter at the Project site.



**C. EMPLOYEES**

The Contractor shall permit only fit and skilled persons to perform the Work. The Contractor shall enforce safety procedures, strict discipline, and good order among persons performing the Work. The Contractor will remove from its employment on the Project any person who deliberately or persistently produces non-conforming Work or who fails or refuses to conform to reasonable rules of personal conduct contained in the Contract Documents or implemented by the Owner and delivered to the Contractor in writing during the course of the Work.

**ARTICLE 7**

**REVIEW of CONTRACT DOCUMENTS and FIELD CONDITIONS by CONTRACTOR**

- A. In order to facilitate assembly and installation of the Work in accordance with the Contract Documents, before starting each portion of the Work, the Contractor shall examine and compare the relevant Contract Documents, and compare them to relevant field measurements made by the Contractor and any conditions at the site affecting that portion of the Work.
- B. If the Contractor discovers any errors, omissions, or inconsistencies in the Contract Documents, the Contractor shall promptly report them to the Architect as a written request for information that includes a detailed statement identifying the specific Drawings or Specifications that are in need of clarification and the error, omission, or inconsistency discovered in them.
- (1) The Contractor shall not be expected to act as a licensed design professional and ascertain whether the Contract Documents comply with applicable laws, statutes, ordinances, building codes, and rules and regulations, but the Contractor shall be obligated to promptly notify the Architect of any such noncompliance discovered by or made known to the Contractor. If the Contractor performs Work without fulfilling this notification obligation, the Contractor shall pay the resulting costs and damages that would have been avoided by such notification.
- (2) The Contractor shall not be liable to the Owner for errors, omissions, or inconsistencies that may exist in the Contract Documents, or between the Contract Documents and conditions at the site, unless the Contractor knowingly fails to report a discovered error, omission, or inconsistency to the Architect, in which case the Contractor shall pay the resulting costs and damages that would have been avoided by such notification.
- C. If the Contractor considers the Architect's response to a request for information to constitute a change to the Contract Documents involving additional costs and/or time, the Contractor shall follow the procedures of Article 20, Claims for Extra Cost or Extra Work.
- D. If, with undue frequency, the Contractor requests information that is obtainable through reasonable examination and comparison of the Contract Documents, site conditions, and previous correspondence, interpretations, or clarifications, the Contractor shall be liable to the Owner for reasonable charges from the Architect for the additional services required to review, research, and respond to such requests for information.

**ARTICLE 8**  
**SURVEYS by CONTRACTOR**

- A. The Contractor shall provide competent engineering services to assure accurate execution of the Work in accordance with the Contract Documents. The Contractor shall verify the figures given for the contours, approaches and locations shown on the Drawings before starting any Work and be responsible for the accuracy of the finished Work. Without extra cost to the Owner, the Contractor shall engage a licensed surveyor if necessary to verify boundary lines, keep within property lines, and shall be responsible for encroachments on rights or property of public or surrounding property owners.
- B. The Contractor shall establish all base lines for the location of the principal components of the Work and make all detail surveys necessary for construction, including grade stakes, batter boards and other working points, lines and elevations. If the Work involves alteration of or addition to existing structures or improvements, the Contractor shall locate and measure elements of the existing conditions as is necessary to facilitate accurate fabrication, assembly, and installation of new Work in the relationship, alignment, and/or connection to the existing structure or improvement as is shown in the Contract Documents.

**ARTICLE 9**  
**SUBMITTALS**

- A. Where required by the Contract Documents, the Contractor shall submit shop drawings, product data, samples and other information (hereinafter referred to as Submittals) to the Architect for the purpose of demonstrating the way by which the Contractor proposes to conform to the requirements of the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect without action.
- B. The Contractor shall be responsible to the Owner for the accuracy of its Submittals and the conformity of its submitted information to the requirements of the Contract Documents. Each Submittal shall bear the Contractor's approval, evidencing that the Contractor has reviewed and found the information to be in compliance with the requirements of the Contract Documents. Submittals which are not marked as reviewed and approved by the Contractor may be returned by the Architect without action.
- C. The Contractor shall prepare and deliver its submittals to the Architect sufficiently in advance of construction requirements and in a sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. In coordinating the Submittal process with its construction schedule, the Contractor shall allow sufficient time to permit adequate review by the Architect.
- D. By approving a Submittal the Contractor represents not only that the element of Work presented in the Submittal complies with the requirements of the Contract Documents, but also that the Contractor has:
  - (1) found the layout and/or dimensions in the Submittal to be comparable with those in the Contract Documents and other relevant Submittals and has made field measurements as necessary to verify their accuracy, and
  - (2) determined that products, materials, systems, equipment and/or procedures presented in the Submittal are compatible with those presented, or being presented, in other relevant Submittals and

with the Contractor's intended Construction Methods.

- E. The Contractor shall not fabricate or perform any portion of the Work for which the Contract Documents require Submittals until the respective Submittals have been approved by the Architect.
- F. In the case of a resubmission, the Contractor shall direct specific attention to all revisions in a Submittal. The Architect's approval of a resubmission shall not apply to any revisions that were not brought to the Architect's attention.
- G. If the Contract Documents specify that a Submittal is to be prepared and sealed by a registered architect or licensed engineer retained by the Contractor, all drawings, calculations, specifications, and certifications of the Submittal shall bear the Alabama seal of registration and signature of the registered/licensed design professional who prepared them or under whose supervision they were prepared. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of such a Submittal, provided that all performance and design criteria that such Submittal must satisfy are sufficiently specified in the Contract Documents. The Architect will review, approve or take other appropriate action on such a Submittal only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria specified in the Contract Documents.

#### **H. DEVIATIONS**

(1) The Architect is authorized by the Owner to approve "minor" deviations from the requirements of the Contract Documents. "Minor" deviations are defined as those which are in the interest of the Owner, do not materially alter the quality or performance of the finished Work, and do not affect the cost or time of performance of the Work. Deviations which are not "minor" may be authorized only by the Owner through the Change Order procedures of Article 19.

(2) Any deviation from the requirements of the Contract Documents contained in a Submittal shall be clearly identified as a "Deviation from Contract Requirements" (or by similar language) within the Submittal and, in a letter transmitting the Submittal to the Architect, the Contractor shall direct the Architect's attention to, and request specific approval of, the deviation. Otherwise, the Architect's approval of a Submittal does not constitute approval of deviations from the requirements of the Contract Documents contained in the Submittal.

(3) The Contractor shall bear all costs and expenses of any changes to the Work, changes to work performed by the Owner or separate contractors, or additional services by the Architect required to accommodate an approved deviation unless the Contractor has specifically informed the Architect in writing of the required changes and a Change Order has been issued authorizing the deviation and accounting for such resulting changes and costs.

#### **I. ARCHITECT'S REVIEW and APPROVAL**

(1) The Architect will review the Contractor's Submittals for conformance with requirements of, and the design concept expressed in, the Contract Documents and will approve or take other appropriate action upon them. This review is not intended to verify the accuracy and completeness of details such as dimensions and quantities nor to substantiate installation instructions or performance of equipment or systems, all of which remain the responsibility of the Contractor. However, the Architect shall advise the Contractor of any errors or omissions which the Architect

may detect during this review. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

(2) The Architect will review and respond to all Submittals with reasonable promptness to avoid delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time to permit adequate review.

(3) No corrections or changes to Submittals indicated by the Architect will be considered as authorizations to perform Extra Work. If the Contractor considers such correction or change of a Submittal to require Work which differs from the requirements of the Contract Documents, the Contractor shall promptly notify the Architect in writing in accordance with Article 20, Claims for Extra Cost or Extra Work.

**J. CONFORMANCE with SUBMITTALS**

The Work shall be constructed in accordance with approved Submittals.

**ARTICLE 10**  
**DOCUMENTS and SAMPLES at the SITE**

**A. "AS ISSUED" SET**

The Contractor shall maintain at the Project site, in good order, at least one copy of all Addenda, Change Orders, supplemental drawings, written directives and clarifications, and approved Submittals intact as issued, and an updated construction schedule.

**B. "POSTED" SET**

The Contractor shall maintain at the Project site, in good order, at least one set of the Drawings and Project Manual into which the Contractor has "posted"(incorporated) all Addenda, Change Orders, supplemental drawings, clarifications, and other information pertinent to the proper performance of the Work. The Contractor shall assure that all sets of the Drawings and Project Manuals being used by the Contractor, Subcontractors, and suppliers are "posted" with the current information to insure that updated Contract Documents are used for performance of the Work.

**C. RECORD SET**

One set of the Drawings and Project Manual described in Paragraph B shall be the Contractor's record set in which the Contractor shall record all field changes, corrections, selections, final locations, and other information as will be duplicated on the "As-built" documents required under Article 11. The Contractor shall record such "as-built" information in its record set as it becomes available through progress of the Work. The Contractor's performance of this requirement shall be subject to confirmation by the Architect at any time as a prerequisite to approval of Progress Payments.

**D.** The documents and samples required by this Article to be maintained at the Project site shall be readily available to the Architect, Owner, DCM Project Inspector, and their representatives.

**ARTICLE 11**  
**“AS-BUILT” DOCUMENTS**

- A. Unless otherwise provided in the Contract Documents, the Contractor shall deliver two (2) sets of “As-built” documents, as described herein, to the Architect for submission to the Owner upon completion of the Work. Each set of “As-built” documents shall consist of a copy of the Drawings and Project Manual, in like-new condition, into which the Contractor has neatly incorporated all Addenda, Change Orders, supplemental drawings, clarifications, field changes, corrections, selections, actual locations of underground utilities, and other information as required herein or specified elsewhere in the Contract Documents.
- B. The Contractor shall use the following methods for incorporating information into the “As-built” documents:
- (1) Drawings**
- (a)** To the greatest extent practicable, information shall be carefully drawn and lettered, in ink, on the Drawings in the form of sketches, details, plans, notes, and dimensions as required to provide a fully dimensioned record of the Work. When required for clarity, sketches, details, or partial plans shall be drawn on supplemental sheets and bound into the Drawings and referenced on the drawing being revised.
- (b)** Where a revised drawing has been furnished by the Architect, the drawing of latest date shall be bound into the Drawings in the place of the superseded drawing.
- (c)** Where a supplemental drawing has been furnished by the Architect, the supplemental drawing shall be bound into the Drawings in an appropriate location and referred to by notes added to the drawing being supplemented.
- (d)** Where the Architect has furnished details, partial plans, or lengthy notes of which it would be impractical for the Contractor to redraw or letter on a drawing, such information may be affixed to the appropriate drawing with transparent tape if space is available on the drawing.
- (e)** Any entry of information made in the Drawings that is the result of an Addendum or Change Order, shall identify the Addendum or Change Order from which it originated.
- (2) Project Manual**
- (a)** A copy of all Addenda and Change Orders, excluding drawings thereof, shall be bound in the front of the Project Manual.
- (b)** Where a document, form, or entire specification section is revised, the latest issue shall be bound into the Project Manual in the place of the superseded issue.
- (c)** Where information within a specification section is revised, the deleted or revised information shall be drawn through in ink and an adjacent note added identifying the Addendum or Change Order containing the revised information.
- C. Within ten days after the Date of Substantial Completion of the Work, or the last completed portion of the Work, the Contractor shall submit the “As-built” documents to the Architect for approval. If the Architect requires that any corrections be made, the documents will be returned in a reasonable time for correction and resubmission.

**ARTICLE 12**  
**PROGRESS SCHEDULE**

(Not applicable if the Contract Time is 60 days or less.)

- A. The Contractor shall within fifteen days after the date of commencement stated in the Notice to Proceed, or such other time as may be provided in the Contract Documents, prepare and submit to the Architect for review and approval a practicable construction schedule informing the Architect and Owner of the order in which the Contractor plans to carry on the Work within the Contract Time. The Architect's review and approval of the Contractor's construction schedule shall be only for compliance with the specified format, Contract Time, and suitability for monitoring progress of the Work and shall not be construed as a representation that the Architect has analyzed the schedule to form opinions of sequences or durations of time represented in the schedule.
- B. If a schedule format is not specified elsewhere in the Contract Documents, the construction schedule shall be prepared using DCM Form C-11, "Sample Progress Schedule and Report", (contained in the Project Manual) or similar format of suitable scale and detail to indicate the percentage of Work scheduled to be completed at the end of each month. At the end of each month the Contractor shall enter the actual percentage of completion on the construction schedule submit two copies to the Architect, and attach one copy to each copy of the monthly Application for Payment. The construction schedule shall be revised to reflect any agreed extensions of the Contract Time or as required by conditions of the Work.
- C. If a more comprehensive schedule format is specified elsewhere in the Contract Documents or voluntarily employed by the Contractor, it may be used in lieu of DCM Form C-11.
- D. The Contractor's construction schedule shall be used by the Contractor, Architect, and Owner to determine the adequacy of the Contractor's progress. The Contractor shall be responsible for maintaining progress in accordance with the currently approved construction schedule and shall increase the number of shifts, and/or overtime operations, days of work, and/or the amount of construction plant and equipment as may be necessary to do so. If the Contractor's progress falls materially behind the currently approved construction schedule and, in the opinion of the Architect or Owner, the Contractor is not taking sufficient steps to regain schedule, the Architect may, with the Owner's concurrence, issue the Contractor a Notice to Cure pursuant to Article 27. In such a Notice to Cure the Architect may require the Contractor to submit such supplementary or revised construction schedules as may be deemed necessary to demonstrate the manner in which schedule will be regained.

**ARTICLE 13**  
**EQUIPMENT, MATERIALS, and SUBSTITUTIONS**

- A. Every part of the Work shall be executed in a workmanlike manner in accordance with the Contract Documents and approved Submittals. All materials used in the Work shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Work and shall be new except such materials as may be expressly provided or allowed in the Contract Documents to be otherwise.
- B. Whenever a product, material, system, item of equipment, or service is identified in the Contract Documents by reference to a trade name, manufacturer's name, model number, etc.(hereinafter

referred to as “source”), and only one or two sources are listed, or three or more sources are listed and followed by “or approved equal” or similar wording, it is intended to establish a required standard of performance, design, and quality, and the Contractor may submit, for the Architect’s approval, products, materials, systems, equipment, or services of other sources which the Contractor can prove to the Architect’s satisfaction are equal to, or exceed, the standard of performance, design and quality specified, unless the provisions of Paragraph D below apply. Such proposed substitutions are not to be purchased or installed without the Architect’s written approval of the substitution.

- C. If the Contract Documents identify three or more sources for a product, material, system, item of equipment or service to be used and the list of sources is not followed by “or approved equal” or similar wording, the Contractor may make substitution only after evaluation by the Architect and execution of an appropriate Contract Change Order.
- D. If the Contract Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the Contractor must furnish the identified sole source.

#### **ARTICLE 14**

#### **SAFETY and PROTECTION of PERSONS and PROPERTY**

- A. The Contractor shall be solely and completely responsible for conditions at the Project site, including safety of all persons (including employees) and property. The Contractor shall create, maintain, and supervise conditions and programs to facilitate and promote safe execution of the Work, and shall supervise the Work with the attention and skill required to assure its safe performance. Safety provisions shall conform to OSHA requirements and all other federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. Nothing contained in this Contract shall be construed to mean that the Owner has employed the Architect nor has the Architect employed its consultants to administer, supervise, inspect, or take action regarding safety programs or conditions at the Project site.
- B. The Contractor shall employ Construction Methods, safety precautions, and protective measures that will reasonably prevent damage, injury or loss to:
  - (1) workers and other persons on the Project site and in adjacent and other areas that may be affected by the Contractor’s operations;
  - (2) the Work and materials and equipment to be incorporated into the Work and stored by the Contractor on or off the Project site; and
  - (3) other property on, or adjacent to, the Project site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and other improvements not designated in the Contract Documents to be removed, relocated, or replaced.
- C. The Contractor shall be responsible for the prompt remedy of damage and loss to property, including the filing of appropriate insurance claims, caused in whole or in part by the fault or negligence of the Contractor, a Subcontractor, or anyone for whose acts they may be liable.

- D. The Contractor shall comply with and give notices required by applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety and protection of persons or property, including without limitation notices to adjoining property owners of excavation or other construction activities that potentially could cause damage or injury to adjoining property or persons thereon.
- E. The Contractor shall erect and maintain barriers, danger signs, and any other reasonable safeguards and warnings against hazards as may be required for safety and protection during performance of the Contract and shall notify owners and users of adjacent sites and utilities of conditions that may exist or arise which may jeopardize their safety.
- F. If use or storage of explosives or other hazardous materials or equipment or unusual Construction Methods are necessary for execution of the Work, the Contractor shall exercise commensurate care and employ supervisors and workers properly qualified to perform such activity.
- G. The Contractor shall furnish a qualified safety representative at the Project site whose duties shall include the prevention of accidents. The safety representative shall be the Contractor's superintendent, unless the Contractor assigns this duty to another responsible member of its on-site staff and notifies the Owner and Architect in writing of such assignment.
- H. The Contractor shall not permit a load to be applied, or forces introduced, to any part of the construction or site that may cause damage to the construction or site or endanger safety of the construction, site, or persons on or near the site.
- I. The Contractor shall have the right to act as it deems appropriate in emergency situations jeopardizing life or property. The Contractor shall be entitled to equitable adjustment of the Contract Sum or Contract Time for its efforts expended for the sole benefit of the Owner in an emergency. Such adjustment shall be determined as provided in Articles 19 and 20.
- J. The duty of the Architect and the Architect's consultants to visit the Project site to conduct periodic inspections of the Work or for other purposes shall not give rise to a duty to review or approve the adequacy of the Contractor's safety program, safety supervisor, or any safety measure which Contractor takes or fails to take in, on, or near the Project site.

## **ARTICLE 15**

### **HAZARDOUS MATERIALS**

- A. A Hazardous Material is any substance or material identified as hazardous under any federal, state, or local law or regulation, or any other substance or material which may be considered hazardous or otherwise subject to statutory or regulatory requirements governing its handling, disposal, and/or clean-up. Existing Hazardous Materials are Hazardous Materials discovered at the Project site and not introduced to the Project site by the Contractor, a Subcontractor, or anyone for whose acts they may be liable.
- B. If, during the performance of the Work, the Contractor encounters a suspected Existing Hazardous Material, the Contractor shall immediately stop work in the affected area, take measures appropriate to the condition to keep people away from the suspected Existing Hazardous Material, and



immediately notify the Architect and Owner of the condition in writing.

- C. The Owner shall obtain the services of an independent laboratory or professional consultant, appropriately licensed and qualified, to determine whether the suspected material is a Hazardous Material requiring abatement and, if so, to certify after its abatement that it has been rendered harmless. Any abatement of Existing Hazardous Materials will be the responsibility of the Owner. The Owner will advise the Contractor in writing of the persons or entities who will determine the nature of the suspected material and those who will, if necessary, perform the abatement. The Owner will not employ persons or entities to perform these services to whom the Contractor or Architect has reasonable objection.
- D. After certification by the Owner's independent laboratory or professional consultant that the material is harmless or has been rendered harmless, work in the affected area shall resume upon written agreement between the Owner and Contractor. If the material is found to be an Existing Hazardous Material and the Contractor incurs additional cost or delay due to the presence and abatement of the material, the Contract Sum and/or Contract Time shall be appropriately adjusted by a Contract Change Order pursuant to Article 19.
- E. The Owner shall not be responsible for Hazardous Materials introduced to the Project site by the Contractor, a Subcontractor, or anyone for whose acts they may be liable unless such Hazardous Materials were required by the Contract Documents.

## **ARTICLE 16**

### **INSPECTION of the WORK**

#### **A. GENERAL**

- (1) The Contractor is solely responsible for the Work's compliance with the Contract Documents; therefore, the Contractor shall be responsible to inspect in-progress and completed Work, and shall verify its compliance with the Contract Documents and that any element or portion of the Work upon which subsequent Work is to be applied or performed is in proper condition to receive the subsequent Work. Neither the presence nor absence of inspections by the Architect, Owner, Director, DCM Project Inspector, any public authority having jurisdiction, or their representatives shall relieve the Contractor of responsibility to inspect the Work, for responsibility for Construction Methods and safety precautions and programs in connection with the Work, or from any other requirement of the Contract Documents.
- (2) The Architect, Owner, Director, DCM Project Inspector, any public authority having jurisdiction, and their representatives shall have access at all times to the Work for inspection whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and inspection. All materials, workmanship, processes of manufacture, and methods of construction, if not otherwise stipulated in the Contract Documents, shall be subject to inspection, examination, and test at any and all places where such manufacture and/or construction are being carried on. Such inspections will not unreasonably interfere with the Contractor's operations.
- (3) The Architect will inspect the Work as a representative of the Owner. The Architect's inspections may be supplemented by inspections by the DCM Project Inspector as a representative of the Alabama Division of Construction Management.

(4) The Contractor may be charged by the Owner for any extra cost of inspection incurred by the Owner or Architect on account of material and workmanship not being ready at the time of inspection set by the Contractor.

## **B. TYPES of INSPECTIONS**

(1) **SCHEDULED INSPECTIONS and CONFERENCES.** Scheduled Inspections and Conferences are conducted by the Architect, scheduled by the Architect in coordination with the Contractor and DCM Project Inspector, and are attended by the Contractor and applicable Subcontractors, suppliers and manufacturers, and the DCM Project Inspector. Scheduled Inspections and Conferences of this Contract include:

(a) **Pre-construction Conference.**

(b) **Pre-roofing Conference** (not applicable if the Contract involves no roofing work)

(c) **Above Ceiling Inspection(s):** An above ceiling inspection of all spaces in the building is required before the ceiling material is installed. Above ceiling inspections are to be conducted at a time when all above ceiling systems are complete and tested to the greatest extent reasonable pending installation of the ceiling material. System identifications and markings are to be complete. All fire-rated construction including fire-stopping of penetrations and specified identification above the ceiling shall be complete. Ceiling framing and suspension systems shall be complete with lights, grilles and diffusers, access panels, fire protection drops for sprinkler heads, etc., installed in their final locations to the greatest extent reasonable. Above ceiling framing to support ceiling mounted equipment shall be complete. The above ceiling construction shall be complete to the extent that after the inspection the ceiling material can be installed without disturbance.

(d) **Final Inspection(s):** A Final Inspection shall establish that the Work, or a designated portion of the Work, is Substantially Complete in accordance with Article 32 and is accepted by the Architect, Owner, and DCM Project Inspector as being ready for the Owner's occupancy or use. At the conclusion of this inspection, items requiring correction or completion ("punch list" items) shall be minimal and require only a short period of time for accomplishment to establish Final Acceptance of the Work. If the Work, or designated portion of the Work, includes the installation, or modification, of a fire alarm system or other life safety systems essential to occupancy, such systems shall have been tested and appropriately certified before the Final Inspection.

(e) **Year-end Inspection(s):** An inspection of the Work, or each separately completed portion thereof, is required near the end of the Contractor's one year warranty period(s). The subsequent delivery of the Architect's report of this inspection will serve as confirmation that the Contractor was notified of Defective Work found within the warranty period in accordance with Article 35.

(2) **PERIODIC INSPECTIONS.** Periodic Inspections are conducted throughout the course of the Work by the Architect, the Architect's consultants, their representatives, and the DCM Project Inspector, jointly or independently, with or without advance notice to the Contractor.

(3) **SPECIFIED INSPECTIONS and TESTS.** Specified Inspections and Tests include inspections, tests, demonstrations, and approvals that are either specified in the Contract Documents or required by laws, ordinances, rules, regulations, or orders of public authorities having jurisdiction, to be performed by the Contractor, one of its Subcontractors, or an independent testing laboratory or firm (whether paid for by the Contractor or Owner).

## **C. INSPECTIONS by the ARCHITECT**

- (1) The Architect is not authorized to revoke, alter, relax, or waive any requirements of the Contract Documents (other than “minor” deviations as defined in Article 9 and “minor” changes as defined in Article 19), to finally approve or accept any portion of the Work or to issue instructions contrary to the Contract Documents without concurrence of the Owner.
- (2) The Architect will visit the site at intervals appropriate to the stage of the Contractor’s operations and as otherwise necessary to:
  - (a) become generally familiar with the in-progress and completed Work and the quality of the Work,
  - (b) determine whether the Work is progressing in general accordance with the Contractor’s schedule and is likely to be completed within the Contract Time,
  - (c) visually compare readily accessible elements of the Work to the requirements of the Contract Documents to determine, in general, if the Contractor’s performance of the Work indicates that the Work will conform to the requirements of the Contract Documents when completed,
  - (d) endeavor to guard the Owner against Defective Work,
  - (e) review and address with the Contractor any problems in implementing the requirements of the Contract Documents that the Contractor may have encountered, and
  - (f) keep the Owner fully informed about the Project.
- (3) The Architect shall have the authority to reject Defective Work or require its correction, but shall not be required to make exhaustive investigations or examinations of the in-progress or completed portions of the Work to expose the presence of Defective Work. However, it shall be an obligation of the Architect to report in writing, to the Owner, Contractor, and DCM Project Inspector, any Defective Work recognized by the Architect.
- (4) The Architect shall have the authority to require the Contractor to stop work only when, in the Architect’s reasonable opinion, such stoppage is necessary to avoid Defective Work. The Architect shall not be liable to the Contractor or Owner for the consequences of any decisions made by the Architect in good faith either to exercise or not to exercise this authority.
- (5) “Inspections by the Architect” includes appropriate inspections by the Architect’s consultants as dictated by their respective disciplines of design and the stage of the Contractor’s operations.

**D. INSPECTIONS by the DCM PROJECT INSPECTOR**

- (1) The DCM Project Inspector will:
  - (a) participate in scheduled inspections and conferences as practicable,
  - (b) perform periodic inspections of in-progress and completed Work to ensure code compliance of the Project and general conformance of the Work with the Contract Documents, and
  - (c) monitor the Contractor's progress and performance of the Work.
- (2) The DCM Project Inspector shall have the authority to:
  - (a) reject Work that is not in compliance with the State Building Code adopted by the DCM, unless the Work is in accordance with the Contract Documents in which case the DCM Project Inspector will advise the Architect to initiate appropriate corrective action, and
  - (b) notify the Architect, Owner, and Contractor of Defective Work recognized by the DCM Project Inspector.

(3) The DCM Project Inspector's periodic inspections will usually be scheduled around key stages of construction based upon information reported by the Architect. As the Architect or Owner deems appropriate, the DCM Project Inspector, as well as other members of the Technical Staff, can be requested to schedule special inspections or meetings to address specific matters. The written findings of DCM Project Inspector will be transmitted to the Owner, Contractor, and Architect.

(4) The DCM Project Inspector is not authorized to revoke, alter, relax, or waive any requirements of the Contract Documents, to finally approve or accept any portion of the Work or to issue instructions contrary to the Contract Documents without concurrence of the Owner. The Contractor shall not proceed with Work as a result of instructions or findings of the DCM Project Inspector which the Contractor considers to be a change to the requirements of the Contract Documents without written authorization of the Owner through the Architect.

**E. UNCOVERING WORK**

(1) If the Contractor covers a portion of the Work before it is examined by the Architect and this is contrary to the Architect's request or specific requirements in the Contract Documents, then, upon written request of the Architect, the Work must be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

(2) Without a prior request or specific requirement that Work be examined by the Architect before it is covered, the Architect may request that Work be uncovered for examination and the Contractor shall uncover it. If the Work is in accordance with the Contract Documents, the Contract Sum shall be equitably adjusted under Article 19 to compensate the Contractor for the costs of uncovering and replacement. If the Work is not in accordance with the Contract Documents, uncovering, correction, and replacement shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

**F. SPECIFIED INSPECTIONS and TESTS**

(1) The Contractor shall schedule and coordinate Specified Inspections and Tests to be made at appropriate times so as not to delay the progress of the Work or the work of the Owner or separate contractors. If the Contract Documents require that a Specified Inspection or Test be witnessed or attended by the Architect or Architect's consultant, the Contractor shall give the Architect timely notice of the time and place of the Specified Inspection or Test. If a Specified Inspection or Test reveals that Work is not in compliance with requirements of the Contract Documents, the Contractor shall bear the costs of correction, repeating the Specified Inspection or Test, and any related costs incurred by the Owner, including reasonable charges, if any, by the Architect for additional services. Through appropriate Contract Change Order the Owner shall bear costs of tests, inspections or approvals which become Contract requirements subsequent to the receipt of bids.

(2) If the Architect, Owner, or public authority having jurisdiction determines that inspections, tests, demonstrations, or approvals in addition to Specified Inspections and Tests are required, the Contractor shall, upon written instruction from the Architect, arrange for their performance by an entity acceptable to the Owner, giving timely notice to the architect of the time and place of their performance. Related costs shall be borne by the Owner unless the procedures reveal that Work is

not in compliance with requirements of the Contract Documents, in which case the Contractor shall bear the costs of correction, repeating the procedures, and any related costs incurred by the Owner, including reasonable charges, if any, by the Architect for additional services.

(3) Unless otherwise required by the Contract Documents, required certificates of Specified Inspections and Tests shall be secured by the Contractor and promptly delivered to the Architect.

(4) Failure of any materials to pass Specified Inspections and Tests will be sufficient cause for refusal to consider any further samples of the same brand or make of that material for use in the Work.

## **ARTICLE 17**

### **CORRECTION of DEFECTIVE WORK**

- A. The Contractor shall, at the Contractor's expense, promptly correct Defective Work rejected by the Architect or which otherwise becomes known to the Contractor, removing the rejected or nonconforming materials and construction from the project site.
- B. Correction of Defective Work shall be performed in such a timely manner as will avoid delay of completion, use, or occupancy of the Work and the work of the Owner and separate contractors.
- C. The Contractor shall bear all expenses related to the correction of Defective Work, including but not limited to: (1) additional testing and inspections, including repeating Specified Inspections and Tests, (2) reasonable services and expenses of the Architect, and (3) the expense of making good all work of the Contractor, Owner, or separate contractors destroyed or damaged by the correction of Defective Work.

## **ARTICLE 18**

### **DEDUCTIONS for UNCORRECTED WORK**

If the Owner deems it advisable and in the Owner's interest to accept Defective Work, the Owner may allow part or all of such Work to remain in place, provided an equitable deduction from the Contract Sum, acceptable to the Owner, is offered by the Contractor.

## **ARTICLE 19**

### **CHANGES in the WORK**

#### **A. GENERAL**

(1) The Owner may at any time direct the Contractor to make changes in the Work which are within the general scope of the Contract, including changes in the Drawings, Specifications, or other portions of the Contract Documents to add, delete, or otherwise revise portions of the Work. The Architect is authorized by the Owner to direct "minor" changes in the Work by written order to the Contractor. "Minor" changes in the Work are defined as those which are in the interest of the Owner, do not materially alter the quality or performance of the finished Work, and do not affect the cost or time of performance of the Work. Changes in the Work which are not "minor" may be

authorized only by the Owner.

(2) If the Owner directs a change in the Work, the change shall be incorporated into the Contract by a Contract Change Order prepared by the Architect and signed by the Contractor, Owner, and other signatories to the Construction Contract, stating their agreement upon the change or changes in the Work and the adjustments, if any, in the Contract Sum and the Contract Time.

(3) Subject to compliance with Alabama's Public Works Law, the Owner may, upon agreement by the Contractor, incorporate previously unawarded bid alternates into the Contract.

(4) In the event of a claim or dispute as to the appropriate adjustment to the Contract Sum or Contract Time due to a directive to make changes in the Work, the Work shall proceed as provided in this article subject to subsequent agreement of the parties or final resolution of the dispute pursuant to Article 24.

(5) Consent of surety will be obtained for all Contract Change Orders involving an increase in the Contract Sum.

(6) Changes in the Work shall be performed under applicable provisions of the Contract Documents and the Contractor shall proceed promptly to perform changes in the Work, unless otherwise directed by the Owner through the Architect.

(7) All change orders require DCM Form C-12: Contract Change Order and DCM Form B-11: Change Order Justification. Only Change Orders 10% or greater of the current contract amount require the Owner's legal advisor's signature on DCM Form B-11: Change Order Justification.

## **B. DETERMINATION of ADJUSTMENT of the CONTRACT SUM**

The adjustment of the Contract Sum resulting from a change in the Work shall be determined by one of the following methods, or a combination thereof, as selected by the Owner:

(1) **Lump Sum.** By mutual agreement to a lump sum based on or negotiated from an itemized cost proposal from the Contractor. Additions to the Contract Sum shall include the Contractor's direct costs plus a maximum 15% markup for overhead and profit. Where subcontract work is involved the total mark-up for the Contractor and a Subcontractor shall not exceed 25%. **Changes which involve a net credit to the Owner shall include fair and reasonable credits for overhead and profit on the deducted work, in no case less than 5%.** For the purposes of this method of determining an adjustment of the Contract Sum, "overhead" shall cover the Contractor's indirect costs of the change, such as the cost of bonds, superintendent and other job office personnel, watchman, job office, job office supplies and expenses, temporary facilities and utilities, and home office expenses.

(2) **Unit Price.** By application of Unit Prices included in the Contract or subsequently agreed to by the parties. However, if the character or quantity originally contemplated is materially changed so that application of such unit price to quantities of Work proposed will cause substantial inequity to either party, the applicable unit price shall be equitably adjusted.

(3) **Force Account.** By directing the Contractor to proceed with the change in the Work on a "force account" basis under which the Contractor shall be reimbursed for reasonable expenditures incurred by the Contractor and its Subcontractors in performing added Work and the Owner shall

receive reasonable credit for any deleted Work. The Contractor shall keep and present, in such form as the Owner may prescribe, an itemized accounting of the cost of the change together with sufficient supporting data. Unless otherwise stated in the directive, the adjustment of the Contract Sum shall be limited to the following:

- (a) costs of labor and supervision, including employee benefits, social security, retirement, unemployment and workers' compensation insurance required by law, agreement, or under Contractor's or Subcontractor's standard personnel policy;
- (b) cost of materials, supplies and equipment, including cost of delivery, whether incorporated or consumed;
- (c) rental cost of machinery and equipment, not to exceed prevailing local rates if contractor-owned;
- (d) costs of premiums for insurance required by the Contract Documents, permit fees, and sales, use or similar taxes related to the change in the Work;
- (e) reasonable credits to the Owner for the value of deleted Work, without Contractor or Subcontractor mark-ups; and
- (f) for additions to the Contract Sum, mark-up of the Contractor's direct costs for overhead and profit not exceeding 15% on Contractor's work nor exceeding 25% for Contractor and Subcontractor on a Subcontractor's work. **Changes which involve a net credit to the Owner shall include fair and reasonable credits for overhead and profit on the deducted work, in no case less than 5%.** For the purposes of this method of determining an adjustment of the Contract Sum, "overhead" shall cover the Contractor's indirect costs of the change, such as the cost of insurance other than mentioned above, bonds, superintendent and other job office personnel, watchman, use and rental of small tools, job office, job office supplies and expenses, temporary facilities and utilities, and home office expenses.

**C. ADJUSTMENT of the CONTRACT TIME due to CHANGES**

(1) Unless otherwise provided in the Contract Documents, the Contract Time shall be equitably adjusted for the performance of a change provided that the Contractor notifies the Architect in writing that the change will increase the time required to complete the Work. Such notice shall be provided no later than:

- (a) with the Contractor's cost proposal stating the number of days of extension requested, or
- (b) within ten days after the Contractor receives a directive to proceed with a change in advance of submitting a cost proposal, in which case the notice should provide an estimated number of days of extension to be requested, which may be subject to adjustment in the cost proposal.

(2) The Contract Time shall be extended only to the extent that the change affects the time required to complete the entire Work of the Contract, taking into account the concurrent performance of the changed and unchanged Work.

**D. CHANGE ORDER PROCEDURES**

(1) If the Owner proposes to make a change in the Work, the Architect will request that the Contractor provide a cost proposal for making the change to the Work. The request shall be in writing and shall adequately describe the proposed change using drawings, specifications, narrative, or a combination thereof. Within 21 days after receiving such a request, or such other time as may be stated in the request, the Contractor shall prepare and submit to the Architect a written proposal, properly itemized and supported by sufficient substantiating data to facilitate evaluation. The stated

time within which the Contractor must submit a proposal may be extended if, within that time, the Contractor makes a written request with reasonable justification thereof.

(2) The Contractor may voluntarily offer a change proposal which, in the Contractor's opinion, will reduce the cost of construction, maintenance, or operation or will improve the cost-effective performance of an element of the Project, in which case the Owner, through the Architect, will accept, reject, or respond otherwise within 21 days after receipt of the proposal, or such other reasonable time as the Contractor may state in the proposal.

(3) If the Contractor's proposal is acceptable to the Owner, or is negotiated to the mutual agreement of the Contractor and Owner, the Architect will prepare an appropriate Contract Change Order for execution. Upon receipt of the fully executed Contract Change Order, the Contractor shall proceed with the change.

(4) In advance of delivery of a fully executed Contract Change Order, the Architect may furnish to the Contractor a written authorization to proceed with an agreed change. However, such an authorization shall be effective only if it:

- (a) identifies the Contractor's accepted or negotiated proposal for the change,
- (b) states the agreed adjustments, if any, in Contract Sum and Contract Time,
- (c) states that funds are available to pay for the change, and
- (d) is signed by the Owner.

(5) If the Contractor and Owner cannot agree on the amount of the adjustment in the Contract Sum for a change, the Owner, through the Architect, may order the Contractor to proceed with the change on a Force Account basis, but the net cost to the Owner shall not exceed the amount quoted in the Contractor's proposal. Such order shall state that funds are available to pay for the change.

(6) If the Contractor does not promptly respond to a request for a proposal, or the Owner determines that the change is essential to the final product of the Work and that the change must be effected immediately to avoid delay of the Project, the Owner may:

- (a) determine with the Contractor a sufficient maximum amount to be authorized for the change and
- (b) direct the Contractor to proceed with the change on a Force Account basis pending delivery of the Contractor's proposal, stating the maximum increase in the Contract Sum that is authorized for the change.

(7) Pending agreement of the parties or final resolution of any dispute of the total amount due the Contractor for a change in the Work, amounts not in dispute for such changes in the Work may be included in Applications for Payment accompanied by an interim Change Order indicating the parties' agreement with part of all of such costs or time extension. Once a dispute is resolved, it shall be implemented by preparation and execution of an appropriate Change Order.

## **ARTICLE 20**

### **CLAIMS for EXTRA COST or EXTRA WORK**

- A. If the Contractor considers any instructions by the Architect, Owner, DCM Project Inspector, or public authority having jurisdiction to be contrary to the requirements of the Contract Documents and will involve extra work and/or cost under the Contract, the Contractor shall give the Architect



written notice thereof within ten days after receipt of such instructions, and in any event before proceeding to execute such work. As used in this Article, “instructions” shall include written or oral clarifications, directions, instructions, interpretations, or determinations.

- B. The Contractor’s notification pursuant to Paragraph 20.A shall state: (1) the date, circumstances, and source of the instructions, (2) that the Contractor considers the instructions to constitute a change to the Contract Documents and why, and (3) an estimate of extra cost and time that may be involved to the extent an estimate may be reasonably made at that time.
- C. Except for claims relating to an emergency endangering life or property, no claim for extra cost or extra work shall be considered in the absence of prior notice required under Paragraph 20.A.
- D. Within ten days of receipt of a notice pursuant to Paragraph 20.A, the Architect will respond in writing to the Contractor, stating one of the following:
  - (1) The cited instruction is rescinded.
  - (2) The cited instruction is a change in the Work and in which manner the Contractor is to proceed with procedures of Article 19, Changes in the Work.
  - (3) The cited instruction is reconfirmed, is not considered by the Architect to be a change in the Contract Documents, and the Contractor is to proceed with Work as instructed.
- E. If the Architect’s response to the Contractor is as in Paragraph 20.D(3), the Contractor shall proceed with the Work as instructed. If the Contractor continues to consider the instructions to constitute a change in the Contract Documents, the Contractor shall, within ten days after receiving the Architect’s response, notify the Architect in writing that the Contractor intends to submit a claim pursuant to Article 24, Resolution of Claims and Disputes

## **ARTICLE 21**

### **DIFFERING SITE CONDITIONS**

#### **A. DEFINITION**

**“Differing Site Conditions” are:**

- (1) subsurface or otherwise concealed physical conditions at the Project site which differ materially from those indicated in the Contract Documents, or
- (2) unknown physical conditions at the Project site which are of an unusual nature, differing materially from conditions ordinarily encountered and generally recognized as inherent in construction activities of the character required by the Contract Documents.

#### **B. PROCEDURES**

If Differing Site Conditions are encountered, then the party discovering the condition shall promptly notify the other party before the condition is disturbed and in no event later than ten days after discovering the condition. Upon such notice and verification that a Differing Site Condition exists, the Architect will, with reasonable promptness and with the Owner’s concurrence, make changes in the Drawings and/or Specifications as are deemed necessary to conform to the Differing

Site Condition. Any increase or decrease in the Contract Sum or Contract Time that is warranted by the changes will be made as provided under Article 19, Changes in the Work. If the Architect determines a Differing Site Condition has not been encountered, the Architect shall notify the Owner and Contractor in writing, stating the reason for that determination.

## **ARTICLE 22** **CLAIMS for DAMAGES**

If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time after the discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

## **ARTICLE 23** **DELAYS**

- A. A delay beyond the Contractor's control at any time in the commencement or progress of Work by an act or omission of the Owner, Architect, or any separate contractor or by labor disputes, unusual delay in deliveries, unavoidable casualties, fires, abnormal floods, tornadoes, or other cataclysmic events of nature, may entitle the Contractor to an extension of the Contract Time provided, however, that the Contractor shall, within ten days after the delay first occurs, give written notice to the Architect of the cause of the delay and its probable effect on progress of the entire Work.
- B. Adverse weather conditions that are more severe than anticipated for the locality of the Work during any given month may entitle the Contractor to an extension of Contract Time provided, however;
  - (1) the weather conditions had an adverse effect on construction scheduled to be performed during the period in which the adverse weather occurred, which in reasonable sequence would have an effect on completion of the entire Work,
  - (2) the Contractor shall, within twenty-one days after the end of the month in which the delay occurs, give the Architect written notice of the delay that occurred during that month and its probable effect on progress of the Work, and
  - (3) within a reasonable time after giving notice of the delay, the Contractor provides the Architect with sufficient data to document that the weather conditions experienced were unusually severe for the locality of the Work during the month in question. Unless otherwise provided in the Contract Documents, data documenting unusually severe weather conditions shall compare actual weather conditions to the average weather conditions for the month in question during the previous five years as recorded by the National Oceanic and Atmospheric Administration (NOAA) or similar record-keeping entities.
- C. Adjustments, if any, of the Contract Time pursuant to this Article shall be incorporated into the Contract by a Contract Change Order prepared by the Architect and signed by the Contractor, Owner, and other signatories to the Construction Contract or, at closeout of the Contract, by mutual

written agreement between the Contractor and Owner. The adjustment of the Contract Time shall not exceed the extent to which the delay extends the time required to complete the entire Work of the Contract.

- D. The Contractor shall not be entitled to any adjustment of the Contract Sum for damage due to delays claimed pursuant to this Article unless the delay was caused by the Owner or Architect and was either:
- (1) the result of bad faith or active interference or
  - (2) beyond the contemplation of the parties and not remedied within a reasonable time after notification by the Contractor of its presence.

## **ARTICLE 24**

### **RESOLUTION of CLAIMS and DISPUTES**

#### **A. APPLICABILITY of ARTICLE**

(1) As used in this Article, “Claims and Disputes” include claims or disputes asserted by the Contractor, its Surety, or Owner arising out of or related to the Contract, or its breach, including without limitation claims seeking, under the provisions of the Contract, equitable adjustment of the Contract Sum or Contract Time and claims and disputes arising between the Contractor (or its Surety) and Owner regarding interpretation of the Contract Documents, performance of the Work, or breach of or compliance with the terms of the Contract.

(2) “Resolution” addressed in this Article applies only to Claims and Disputes arising between the Contractor (or its Surety) and Owner and asserted after execution of the Construction Contract and prior to the date upon which final payment is made. Upon making application for final payment the Contractor may reserve the right to subsequent Resolution of existing Claims by including a list of all Claims, in stated amounts, which remain to be resolved and specifically excluding them from any release of claims executed by the Contractor, and in that event Resolution may occur after final payment is made.

#### **B. CONTINUANCE of PERFORMANCE**

An unresolved Claim or Dispute shall not be just cause for the Contractor to fail or refuse to proceed diligently with performance of the Contract or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.

#### **C. GOOD FAITH EFFORT to SETTLE**

The Contractor and Owner agree that, upon the assertion of a Claim by the other, they will make a good faith effort, with the Architect’s assistance and advice, to achieve mutual resolution of the Claim. If mutually agreed, the Contractor and Owner may endeavor to resolve a Claim through mediation. If efforts to settle are not successful, the Claim shall be resolved in accordance with paragraph D or E below, whichever applies.

#### **D. FINAL RESOLUTION for STATE-FUNDED CONTRACTS**

(1) If the Contract is funded in whole or in part with state funds, the final Resolution of Claims

and Disputes which cannot be resolved by the Contractor (or its Surety) and Owner shall be by the Director, whose decision shall be final, binding, and conclusive upon the Contractor, its Surety, and the Owner.

(2) When it becomes apparent to the party asserting a Claim (the Claimant) that an impasse to mutual resolution has been reached, the Claimant may request in writing to the Director that the Claim be resolved by decision of the Director. Such request by the Contractor (or its Surety) shall be submitted through the Owner. Should the Owner fail or refuse to submit the Contractor's request within ten days of receipt of same, the Contractor may forward such request directly to the Director. Upon receipt of a request to resolve a Claim, the Director will instruct the parties as to procedures to be initiated and followed.

(3) If the respondent to a Claim fails or refuses to participate or cooperate in the Resolution procedures to the extent that the Claimant is compelled to initiate legal proceedings to induce the Respondent to participate or cooperate, the Claimant will be entitled to recover, and may amend its Claim to include, the expense of reasonable attorney's fees so incurred.

#### **E. FINAL RESOLUTION for LOCALLY-FUNDED CONTRACTS**

If the Contract is funded in whole with funds provided by a city or county board of education or other local governmental authority and the Contract Documents do not stipulate a binding alternative dispute resolution method, the final resolution of Claims and Disputes which cannot be resolved by the Contractor (or its Surety) and Owner may be by any legal remedy available to the parties. Alternatively, upon the written agreement of the Contractor (or its Surety) and the Owner, final Resolution of Claims and Disputes may be by submission to binding arbitration before a neutral arbitrator or panel or by submission to the Director in accordance with preceding Paragraph D.

### **ARTICLE 25** **OWNER'S RIGHT to CORRECT DEFECTIVE WORK**

If the Contractor fails or refuses to correct Defective Work in a timely manner that will avoid delay of completion, use, or occupancy of the Work or work by the Owner or separate contractors, the Architect may give the Contractor written Notice to Cure the Defective Work within a reasonable, stated time. If within ten days after receipt of the Notice to Cure the Contractor has not proceeded and satisfactorily continued to cure the Defective Work or provided the Architect with written verification that satisfactory positive action is in process to cure the Defective Work, the Owner may, without prejudice to any other remedy available to the Owner, correct the Defective Work and deduct the actual cost of the correction from payment then or thereafter due to the Contractor.

### **ARTICLE 26** **OWNER'S RIGHT to STOP or SUSPEND the WORK**

#### **A. STOPPING the WORK for CAUSE**

If the Contractor fails to correct Defective Work or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work, or any part of the Work, until the cause for the Owner's directive has been eliminated;

however, the Owner's right to stop the Work shall not be construed as a duty of the Owner to be exercised for the benefit of the Contractor or any other person or entity.

**B. SUSPENSION by the OWNER for CONVENIENCE**

- (1) The Owner may, at any time and without cause, direct the Contractor in writing to suspend, delay or interrupt the Work, or any part of the Work, for a period of time as the Owner may determine.
- (2) The Contract Sum and Contract Time shall be adjusted, pursuant to Article 19, for reasonable increases in the cost and time caused by an Owner-directed suspension, delay or interruption of Work for the Owner's convenience. However, no adjustment to the Contract Sum shall be made to the extent that the same or concurrent Work is, was or would have been likewise suspended, delayed or interrupted for other reasons not caused by the Owner.

**ARTICLE 27**  
**OWNER'S RIGHT to TERMINATE CONTRACT**

**A. TERMINATION by the OWNER for CAUSE**

- (1) **Causes:** The Owner may terminate the Contractor's right to complete the Work, or any designated portion of the Work, if the Contractor:
  - (a) should be adjudged bankrupt, or should make a general assignment for the benefit of the Contractor's creditors, or if a receiver should be appointed on account of the Contractor's insolvency to the extent termination for these reasons is permissible under applicable law;
  - (b) refuses or fails to prosecute the Work, or any part of the Work, with the diligence that will insure its completion within the Contract Time, including any extensions, or fails to complete the Work within the Contract Time;
  - (c) refuses or fails to perform the Work, including prompt correction of Defective Work, in a manner that will insure that the Work, when fully completed, will be in accordance with the Contract Documents;
  - (d) fails to pay for labor or materials supplied for the Work or to pay Subcontractors in accordance with the respective Subcontract;
  - (e) persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction, or the instructions of the Architect or Owner; or
  - (f) is otherwise guilty of a substantial breach of the Contract.
- (2) **Procedure for Unbonded Construction Contracts (Generally, contracts less than \$50,000):**
  - (a) **Notice to Cure:** In the presence of any of the above conditions the Architect may give the Contractor written notice to cure the condition within a reasonable, stated time, but not less than ten days after the Contractor receives the notice.
  - (b) **Notice of Termination:** If, at the expiration of the time stated in the Notice to Cure, the Contractor has not proceeded and satisfactorily continued to cure the condition or provided the Architect with written verification that satisfactory positive action is in process to cure the condition, the Owner may, without prejudice to any other rights or remedies of the Owner, give the Contractor written notice that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the

written Notice of Termination.

(c) If the Contractor satisfies a Notice to Cure, but the condition for which the notice was first given reoccurs, the Owner may give the Contractor a seven day Notice of Termination without giving the Contractor another Notice to Cure.

(d) At the expiration of the seven days of the termination notice, the Owner may:

.1 take possession of the site, of all materials and equipment stored on and off site, and of all Contractor-owned tools, construction equipment and machinery, and facilities located at the site, and

.2 finish the Work by whatever reasonable method the Owner may deem expedient.

(e) The Contractor shall not be entitled to receive further payment under the Contract until the Work is completed.

(f) If the Owner's cost of completing the Work, including correction of Defective Work, compensation for additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees due to the default and termination, is less than the unpaid balance of the Contract Sum, the excess balance less liquidated damages for delay shall be paid to the Contractor. If such cost to the Owner including attorney's fees, plus liquidated damages, exceeds the unpaid balance of the Contract Sum, the Contractor shall pay the difference to the Owner. Final Resolution of any claim or Dispute involving the termination or any amount due any party as a result of the termination shall be pursuant to Article 24.

(g) Upon the Contractor's request, the Owner shall furnish to the Contractor a detailed accounting of the Owner's cost of completing the Work.

**(3) Procedure for Bonded Construction Contracts (Generally, contracts over \$50,000):**

(a) **Notice to Cure:** In the presence of any of the above conditions the Architect may give the Contractor and its Surety written Notice to Cure the condition within a reasonable, stated time, but not less than ten days after the Contractor receives the notice.

(b) **Notice of Termination:** If, at the expiration of the time stated in the Notice to Cure, the Contractor has not proceeded and satisfactorily continued to cure the condition or provided the Architect with written verification that satisfactory positive action is in process to cure the condition, the Owner may, without prejudice to any other rights or remedies of the Owner, give the Contractor and its Surety written notice declaring the Contractor to be in default under the Contract and stating that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the written Notice of Termination.

(c) If the Contractor satisfies a Notice to Cure, but the condition for which the notice was first given reoccurs, the Owner may give the Contractor a Notice of Termination without giving the Contractor another Notice to Cure.

(d) **Demand on the Performance Bond:** With the Notice of Termination the Owner shall give the Surety a written demand that, upon the effective date of the Notice of Termination, the Surety promptly fulfill its obligation to take charge of and complete the Work in accordance with the terms of the Performance Bond.

(e) **Surety Claims:** Upon receiving the Owner's demand on the Performance Bond, the Surety shall assume all rights and obligations of the Contractor under the Contract. However, the Surety shall also have the right to assert "Surety Claims" to the Owner, which are defined as claims relating to acts or omissions of the Owner or Architect prior to termination of the Contractor which may have prejudiced its rights as Surety or its interest in the unpaid balance of the Contract Sum. If the Surety wishes to assert a Surety Claim, it shall give the Owner, through the Architect, written notice within twenty-one days after first recognizing the

condition giving rise to the Surety Claim. The Surety Claim shall then be submitted to the Owner, through the Architect, no later than sixty days after giving notice thereof, but no such Surety Claims shall be considered if submitted after the date upon which final payment becomes due. Final resolution of Surety Claims shall be pursuant to Article 24, Resolution of Claims and Disputes. The presence or possibility of a Surety Claim shall not be just cause for the Surety to fail or refuse to take charge of and complete the Work or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.

**(f) Payments to Surety:** The Surety shall be paid for completing the Work in accordance with the Contract Documents as if the Surety were the Contractor. The Owner shall have the right to deduct from payments to the Surety any reasonable costs incurred by the Owner, including compensation for additional architectural, engineering, managerial, and administrative services, and attorneys' fees as necessitated by termination of the Contractor and completion of the Work by the Surety. No further payments shall be made to the Contractor by the Owner. The Surety shall be solely responsible for any accounting to the Contractor for the portion of the Contract Sum paid to Surety by Owner or for the costs and expenses of completing the Work.

**(4) Wrongful Termination:** If any notice of termination by the Owner for cause, made in good faith, is determined to have been wrongly given, such termination shall be effective and compensation therefore determined as if it had been a termination for convenience pursuant to Paragraph B below.

**B. TERMINATION by the OWNER for CONVENIENCE**

**(1)** The Owner may, without cause and at any time, terminate the performance of Work under the Contract in whole, or in part, upon determination by the Owner that such termination is in the Owner's best interest. Such termination is referred to herein as Termination for Convenience.

**(2)** Upon receipt of a written notice of Termination for Convenience from the Owner, the Contractor shall:

- (a)** stop Work as specified in the notice;
- (b)** enter into no further subcontracts or purchase orders for materials, services, or facilities, except as may be necessary for Work directed to be performed prior to the effective date of the termination or to complete Work that is not terminated;
- (c)** terminate all existing subcontracts and purchase orders to the extent they relate to the terminated Work;
- (d)** take such actions as are necessary, or directed by the Architect or Owner, to protect, preserve, and make safe the terminated Work; and
- (e)** complete performance of the Work that is not terminated.

**(3)** In the event of Termination for Convenience, the Contractor shall be entitled to receive payment for the Work performed prior to its termination, including materials and equipment purchased and delivered for incorporation into the terminated Work, and any reasonable costs incurred because of the termination. Such payment shall include reasonable mark-up of costs for overhead and profit, not to exceed the limits stated in Article 19, Changes in the Work. The Contractor shall be entitled to receive payment for reasonable anticipated overhead ("home office") and shall not be entitled to receive payment for any profits anticipated to have been gained from the terminated Work. A proposal for decreasing the Contract Sum shall be submitted to the Architect by the Contractor in such time and detail, and with such supporting documentation, as is reasonably

directed by the Owner. Final modification of the Contract shall be by Contract Change Order pursuant to Article 19. Any Claim or Dispute involving the termination or any amount due a party as a result shall be resolved pursuant to Article 24.

## **ARTICLE 28**

### **CONTRACTOR'S RIGHT to SUSPEND or TERMINATE the CONTRACT**

#### **A. SUSPENSION by the OWNER**

If all of the Work is suspended or delayed for the Owner's convenience or under an order of any court, or other public authority, for a period of sixty days, through no act or fault of the Contractor or a Subcontractor, or anyone for whose acts they may be liable, then the Contractor may give the Owner a written Notice of Termination which allows the Owner fourteen days after receiving the Notice in which to give the Contractor appropriate written authorization to resume the Work. Absent the Contractor's receipt of such authorization to resume the Work, the Contract shall terminate upon expiration of this fourteen day period and the Contractor will be compensated by the Owner as if the termination had been for the Owner's convenience pursuant to Article 27.B.

#### **B. NONPAYMENT**

The Owner's failure to pay the undisputed amount of an Application for Payment within sixty days after receiving it from the Architect (Certified pursuant to Article 30) shall be just cause for the Contractor to give the Owner fourteen days' written notice that the Work will be suspended pending receipt of payment but that the Contract shall terminate if payment is not received within fourteen days (or a longer period stated by the Contractor) of the expiration of the fourteen day notice period.

(1) If the Work is then suspended for nonpayment, but resumed upon receipt of payment, the Contractor will be entitled to compensation as if the suspension had been by the Owner pursuant to Article 26, Paragraph B.

(2) If the Contract is then terminated for nonpayment, the Contractor will be entitled to compensation as if the termination had been by the Owner pursuant to Article 27, Paragraph B.

## **ARTICLE 29**

### **PROGRESS PAYMENTS**

#### **A. FREQUENCY of PROGRESS PAYMENTS**

Unless otherwise provided in the Contract Documents, the Owner will make payments to the Contractor as the Work progresses based on monthly estimates prepared and certified by the Contractor, approved and certified by the Architect, and approved by the Owner and other authorities whose approval is required.

#### **B. SCHEDULE of VALUES**

Within ten days after receiving the Notice to Proceed the Contractor shall submit to the Architect a



DCM Form C-10SOV, Schedule of Values, which is a breakdown of the Contract Sum showing the value of the various parts of the Work for billing purposes. The Schedule of Values shall be printable on 8.5" × 11" for DCM's scanning purposes and shall divide the Contract Sum into as many parts ("line items") as the Architect and Owner determine necessary to permit evaluation and to show amounts attributable to Subcontractors. The Contractor's overhead and profit are to be proportionately distributed throughout the line items of the Schedule of Values. Upon approval, the Schedule of Values shall be used as a basis for monthly Applications for Payment, unless it is later found to be in error. Approved change order amounts shall be added to or incorporated into the Schedule of Values as mutually agreed by the Contractor and Architect.

**C. APPLICATIONS for PAYMENTS**

(1) Based on the approved Schedule of Values, each DCM Form C-10, Application and Certificate for Payment shall show the Contractor's estimate of the value of Work performed in each line item as of the end of the billing period. The Contractor's cost of materials and equipment not yet incorporated into the Work, but delivered and suitably stored on the site, may be considered in monthly Applications for Payment. One payment application per month may be submitted. Each DCM Form C-10, Application and Certificate for Payment shall match to the penny and be accompanied by an attached DCM Form C-10SOV, Schedule of Values.

(2) The Contractor's estimate of the value of Work performed and stored materials must represent such reasonableness as to warrant certification by the Architect to the Owner in accordance with Article 30. Each monthly Application for Payment shall be supported by such data as will substantiate the Contractor's right to payment, including without limitation copies of requisitions from subcontractors and material suppliers.

(3) If no other date is stated in the Contract Documents or agreed upon by the parties, each Application for Payment shall be submitted to the Architect on or about the first day of each month and payment shall be issued to the Contractor within thirty days after an Application for Payment is Certified pursuant to Article 30 and delivered to the Owner.

(4) Two copies of DCM Form C-10, Application and Certificate for Payment containing original signatures, with each copy of DCM Form C-10 to include all attachments, shall be submitted to DCM for review following the Contractor's, Notary's (for paper submittals), Architect's and Owner's signatures.

**D. MATERIALS STORED OFF SITE**

Unless otherwise provided in the Contract Documents, the Contractor's cost of materials and equipment to be incorporated into the Work, which are stored off the site, may also be considered in monthly Applications for Payment under the following conditions:

- (1) the contractor has received written approval from the Architect and Owner to store the materials or equipment off site in advance of delivering the materials to the off site location;
- (2) a Certificate of Insurance is furnished to the Architect evidencing that a special insurance policy, or rider to an existing policy, has been obtained by the Contractor providing all-risk property insurance coverage, specifically naming the materials or equipment stored, and naming the Owner as an additionally insured party;
- (3) the Architect is provided with a detailed inventory of the stored materials or equipment and the materials or equipment are clearly marked in correlation to the inventory to facilitate

inspection and verification of the presence of the materials or equipment by the Architect or Owner;

- (4) the materials or equipment are properly and safely stored in a bonded warehouse, or a facility otherwise approved in advance by the Architect and Owner; and
- (5) compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest.

**E. RETAINAGE**

(1) "Retainage" is defined as the money earned and, therefore, belonging to the Contractor (subject to final settlement of the Contract) which has been retained by the Owner conditioned on final completion and acceptance of all Work required by the Contract Documents. Retainage shall not be relied upon by Contractor (or Surety) to cover or off-set unearned monies attributable to uncompleted or uncorrected Work.

(2) In making progress payments the Owner shall retain five percent of the estimated value of Work performed and the value of the materials stored for the Work; but after retainage has been held upon fifty percent of the Contract Sum, no additional retainage will be withheld.

**F. CONTRACTOR'S CERTIFICATION**

(1) Each Application for Payment shall bear the Contractor's notarized certification that, to the best of the Contractor's knowledge, information, and belief, the Work covered by the Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payments were issued and payments received from the Owner and that the current payment shown in the Application for Payment has not yet been received.

(2) By making this certification the Contractor represents to the Architect and Owner that, upon receipt of previous progress payments from the Owner, the Contractor has promptly paid each Subcontractor, in accordance with the terms of its agreement with the Subcontractor, the amount due the Subcontractor from the amount included in the progress payment on account of the Subcontractor's Work and stored materials. The Architect and Owner may advise Subcontractors and suppliers regarding percentages of completion or amounts requested and/or approved in an Application for Payment on account of the Subcontractor's Work and stored materials.

**G. PAYMENT ESTABLISHES OWNERSHIP**

All material and Work covered by progress payments shall become the sole property of the Owner, but the Contractor shall not be relieved from the sole responsibility for the care and protection of material and Work upon which payments have been made and for the restoration of any damaged material and Work.

**ARTICLE 30**  
**CERTIFICATION and APPROVALS for PAYMENT**

- A. The Architect's review, approval, and certification of Applications for Payment shall be based on the Architect's general knowledge of the Work obtained through site visits and the information

provided by the Contractor with the Application. The Architect shall not be required to perform exhaustive examinations, evaluations, or estimates of the cost of completed or uncompleted Work or stored materials to verify the accuracy of amounts requested by the Contractor, but the Architect shall have the authority to adjust the Contractor's estimate when, in the Architect's reasonable opinion, such estimates are overstated or understated.

- B.** Within seven days after receiving the Contractor's monthly Application for Payment, or such other time as may be stated in the Contract Documents, the Architect will take one of the following actions:
- (1)** The Architect will approve and certify the Application as submitted and forward it to the Owner as a Certification for Payment for approval by the Owner (and other approving authorities, if any) and payment.
  - (2)** If the Architect takes exception to any amounts claimed by the Contractor and the Contractor and Architect cannot agree on revised amounts, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to certify to the Owner, transmitting a copy of same to the Contractor.
  - (3)** To the extent the Architect determines may be necessary to protect the Owner from loss on account of any of the causes stated in Article 31, the Architect may subtract from the Contractor's estimates and will issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as the Architect determines is properly due and notify the Contractor and Owner in writing of the Architect's reasons for withholding payment in whole or in part.
- C.** Neither the Architect's issuance of a Certificate for Payment nor the Owner's resulting progress payment shall be a representation to the Contractor that the Work in progress or completed at that time is accepted or deemed to be in conformance with the Contract Documents.
- D.** The Architect shall not be required to determine that the Contractor has promptly or fully paid Subcontractors and suppliers or how or for what purpose the Contractor has used monies paid under the Construction Contract. However, the Architect may, upon request and if practical, inform any Subcontractor or supplier of the amount, or percentage of completion, approved or paid to the Contractor on account of the materials supplied or the Work performed by the Subcontractor.

### **ARTICLE 31** **PAYMENTS WITHHELD**

- A.** The Architect may nullify or revise a previously issued Certificate for Payment prior to Owner's payment thereunder to the extent as may be necessary in the Architect's opinion to protect the Owner from loss on account of any of the following causes not discovered or fully accounted for at the time of the certification or approval of the Application for Payment:
- (1)** Defective Work;
  - (2)** filed, or reasonable evidence indicating probable filing of, claims arising out of the Contract by other parties against the Contractor;
  - (3)** the Contractor's failure to pay for labor, materials or equipment or to pay Subcontractors;
  - (4)** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

- (5) damage suffered by the Owner or another contractor caused by the Contractor, a Subcontractor, or anyone for whose acts they may be liable;
  - (6) reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance is insufficient to cover applicable liquidated damages; or
  - (7) the Contractor's persistent failure to conform to the requirements of the Contract Documents.
- B. If the Owner deems it necessary to withhold payment pursuant to preceding Paragraph A, the Owner will notify the Contractor and Architect in writing of the amount to be withheld and the reason for same.
- C. The Architect shall not be required to withhold payment for completed or partially completed Work for which compliance with the Contract Documents remains to be determined by Specified Inspections or Final Inspections to be performed in their proper sequence. However, if Work for which payment has been approved, certified, or made under an Application for Payment is subsequently determined to be Defective Work, the Architect shall determine an appropriate amount that will protect the Owner's interest against the Defective Work.
- (1) If payment has not been made against the Application for Payment first including the Defective Work, the Architect will notify the Owner and Contractor of the amount to be withheld from the payment until the Defective Work is brought into compliance with the Contract Documents.
  - (2) If payment has been made against the Application for Payment first including the Defective Work, the Architect will withhold the appropriate amount from the next Application for Payment submitted after the determination of noncompliance, such amount to then be withheld until the Defective Work is brought into compliance with the Contract Documents.
- D. The amount withheld will be paid with the next Application for Payment certified and approved after the condition for which the Owner has withheld payment is removed or otherwise resolved to the Owner's satisfaction.
- E. The Owner shall have the right to withhold from payments due the Contractor under this Contract an amount equal to any amount which the Contractor owes the Owner under another contract.

## **ARTICLE 32**

### **SUBSTANTIAL COMPLETION**

- A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion of the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use without disruption or interference by the Contractor in completing or correcting any remaining unfinished Work ("punch list" items). Substantial Completion of the Work, or a designated portion of the Work, is not achieved until so agreed in a Certificate of Substantial Completion signed by the Contractor, Architect, Owner, and Technical Staff of the Alabama Division of Construction Management.
- B. The Contractor shall notify the Architect in writing when it considers the Work, or a portion of the Work which the Owner has agreed to accept separately, to be substantially complete and ready for a Final Inspection pursuant to Article 16. In this notification the Contractor shall identify any items

remaining to be completed or corrected for Final Acceptance prior to final payment.

- C. Substantial Completion is achieved and a Final Inspection is appropriate only when a minimal number of punch list items exists and only a short period of time will be required to correct or complete them. Upon receipt of the Contractor's notice for a Final Inspection, the Architect will advise the Contractor in writing of any conditions of the Work which the Architect or Owner is aware do not constitute Substantial Completion, otherwise, a Final Inspection will proceed within a reasonable time after the Contractor's notice is given. However, the Architect will not be required to prepare lengthy listings of punch list items; therefore, if the Final Inspection discloses that Substantial Completion has not been achieved, the Architect may discontinue or suspend the inspection until the Contractor does achieve Substantial Completion.

**D. CERTIFICATE of SUBSTANTIAL COMPLETION**

(1) When the Work or a designated portion of the Work is substantially complete, the Architect will prepare and sign a Certificate of Substantial Completion to be signed in order by the Contractor, Owner, and Alabama Division of Construction Management.

(2) When signed by all parties, the Certificate of Substantial Completion shall establish the Date of Substantial Completion which is the date upon which:

- (a) the Work, or designated portion of the Work, is accepted by the Architect, Owner, and Alabama Division of Construction Management as being ready for occupancy,
- (b) the Contractor's one-year and special warranties for the Work covered by the Certificate commence, unless stated otherwise in the Certificate (the one-year warranty for punch list items completed or corrected after the period allowed in the Certificate shall commence on the date of their Final Acceptance), and
- (c) Owner becomes responsible for building security, maintenance, utility services, and insurance, unless stated otherwise in the Certificate.

(3) The Certificate of Substantial Completion shall set the time within which the Contractor shall finish all items on the "punch list" accompanying the Certificate. The completion of punch list items shall be a condition precedent to Final Payment.

(4) If the Work or designated portion covered by a Certificate of Substantial Completion includes roofing work, the General Contractor's (5-year) Roofing Guarantee, DCM Form C-9, must be executed by the Contractor and attached to the Certificate of Substantial Completion. If the Contract Documents specify any other roofing warranties to be provided by the roofing manufacturer, Subcontractor, or Contractor, they must also be attached to the Certificate of Substantial Completion. The Alabama Division of Construction Management will not sign the Certificate of Substantial Completion in the absence of the roofing guarantees.

- E. The Date of Substantial Completion of the Work, as set in the Certificate of Substantial Completion of the Work or of the last completed portion of the Work, establishes the extent to which the Contractor is liable for Liquidated Damages, if any; however, should the Contractor fail to complete all punch list items within thirty days, or such other time as may be stated in the respective Certificate of Substantial Completion, the Contractor shall bear any expenses, including additional Architectural services and expenses, incurred by the Owner as a result of such failure to complete punch list items in a timely manner.

**ARTICLE 33**  
**OCCUPANCY or USE PRIOR to COMPLETION**

**A. UPON SUBSTANTIAL COMPLETION**

Prior to completion of the entire Work, the Owner may occupy or begin utilizing any designated portion of the Work on the agreed Date of Substantial Completion of that portion of the Work.

**B. BEFORE SUBSTANTIAL COMPLETION**

(1) The Owner shall not occupy or utilize any portion of the Work before Substantial Completion of that portion has been achieved.

(2) The Owner may deliver furniture and equipment and store, or install it in place ready for occupancy and use, in any designated portion of the Work before it is substantially completed under the following conditions:

(a) The Owner's storage or installation of furniture and equipment will not unreasonably disrupt or interfere with the Contractor's completion of the designated portion of the Work.

(b) The Contractor consents to the Owner's planned action (such consent shall not be unreasonably withheld).

(c) The Owner shall be responsible for insurance coverage of the Owner's furniture and equipment, and the Contractor's liability shall not be increased.

(d) The Contractor, Architect, and Owner will jointly inspect and record the condition of the Work in the area before the Owner delivers and stores or installs furniture and equipment; the Owner will equitably compensate the Contractor for making any repairs to the Work that may subsequently be required due to the Owner's delivery and storage or installation of furniture and equipment.

(e) The Owner's delivery and storage or installation of furniture and equipment shall not be deemed an acceptance of any Work not completed in accordance with the requirements of the Contract Documents.

**ARTICLE 34**  
**FINAL PAYMENT**

**A. PREREQUISITES to FINAL PAYMENT**

The following conditions are prerequisites to Final Payment becoming due the Contractor:

(1) Full execution of a Certificate of Substantial Completion for the Work, or each designated portion of the Work.

(2) Final Acceptance of the Work.

(3) The Contractor's completion, to the satisfaction of the Architect and Owner, of all documentary requirements of the Contract Documents; such as delivery of "as-built" documents, operating and maintenance manuals, warranties, etc.

(4) Delivery to the Owner of a final Application for Payment, prepared by the Contractor and approved and certified by the Architect. Architect prepares DCM Form B-13: Final Payment Checklist and forwards it to the Owner along with the final Application for Payment.

(5) Completion of an Advertisement for Completion pursuant to Paragraph C below.

(6) Delivery by the Contractor to the Owner through the Architect of DCM Form C-18:

Contractor's Affidavit of Payment of Debts and Claims, and a Release of Claims, if any, and such other documents as may be required by Owner, satisfactory in form to the Owner pursuant to Paragraph D below.

- (7) Consent of Surety to Final Payment, if any, to Contractor. This Consent of Surety is required for projects which have Payment and Performance Bonds.
- (8) Delivery by the Contractor to the Architect and Owner of other documents, if any, required by the Contract Documents as prerequisites to Final Payment.
- (9) See Manual of Procedures Chapter 7, Section L.7 concerning reconciliation of contract time, if any.

**B. FINAL ACCEPTANCE of the WORK**

"Final Acceptance of the Work" shall be achieved when all "punch list" items recorded with the Certificate(s) of Substantial Completion are accounted for by either: **(1)** their completion or correction by the Contractor and acceptance by the Architect, Owner, and DCM Project Inspector, or **(2)** their resolution under Article 18, Deductions for Uncorrected Work.

**C. ADVERTISEMENT for COMPLETION**

**(1) If the Contract Sum is \$50,000 or less:** The Owner, immediately after being notified by the Architect that all other requirements of the Contract have been completed, shall give public notice of completion of the Contract by having an Advertisement for Completion published one time in a newspaper of general circulation, published in the county in which the Owner is located for one week, and shall require the Contractor to certify under oath that all bills have been paid in full. Final payment may be made at any time after the notice has been posted for one entire week.

**(2) If the Contract Sum is more than \$50,000:** The Contractor, immediately after being notified by the Architect that all other requirements of the Contract have been completed, shall give public notice of completion of the Contract by having an Advertisement for Completion, similar to the sample contained in the Project Manual, published for a period of four successive weeks in some newspaper of general circulation published within the city or county where the Work was performed. Proof of publication of the Advertisement for Completion shall be made by the Contractor to the Architect by affidavit of the publisher, in duplicate, and a printed copy of the Advertisement for Completion published, in duplicate. If no newspaper is published in the county where the work was done, the notice may be given by posting at the Court House for thirty days and proof of same made by Probate Judge or Sheriff and the Contractor. Final payment shall not be due until thirty days after this public notice is completed.

**D. RELEASE of CLAIMS**

The Release of Claims and other documents referenced in Paragraph A(6) above are as follows:

**(1)** A release executed by Contractor of all claims and claims of lien against the Owner arising under and by virtue of the Contract, other than such claims of the Contractor, if any, as may have been previously made in writing and as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein.

**(2)** An affidavit under oath, if required, stating that so far as the Contractor has knowledge or information, there are no claims or claims of lien which have been or will be filed by any Subcontractor, Supplier or other party for labor or material for which a claim or claim of lien could

be filed.

(3) A release, if required, of all claims and claims of lien made by any Subcontractor, Supplier or other party against the Owner or unpaid Contract funds held by the Owner arising under or related to the Work on the Project; provided, however, that if any Subcontractor, Supplier or others refuse to furnish a release of such claims or claims of lien, the Contractor may furnish a bond executed by Contractor and its Surety to the Owner to provide an unconditional obligation to defend, indemnify and hold harmless the Owner against any loss, cost or expense, including attorney's fees, arising out of or as a result of such claims, or claims of lien, in which event Owner may make Final Payment notwithstanding such claims or claims of lien. If Contractor and Surety fail to fulfill their obligations to Owner under the bond, the Owner shall be entitled to recover damages as a result of such failure, including all costs and reasonable attorney's fees incurred to recover such damages.

#### **E. EFFECT of FINAL PAYMENT**

(1) The making of Final Payment shall constitute a waiver of Claims by the Owner except those arising from:

- (a) liens, claims, security interests or encumbrances arising out of the Contract and unsettled;
- (b) failure of the Work to comply with the requirements of the Contract Documents;
- (c) terms of warranties or indemnities required by the Contract Documents, or
- (d) latent defects.

(2) Acceptance of Final Payment by the Contractor shall constitute a waiver of claims by Contractor except those previously made in writing, identified by Contractor as unsettled at the time of final Application for Payment, and specifically excepted from the release provided for in Paragraph D(1), above.

### **ARTICLE 35** **CONTRACTOR'S WARRANTY**

#### **A. GENERAL WARRANTY**

The Contractor warrants to the Owner and Architect that all materials and equipment furnished under the Contract will be of good quality and new, except such materials as may be expressly provided or allowed in the Contract Documents to be otherwise, and that none of the Work will be Defective Work as defined in Article 1.

#### **B. ONE-YEAR WARRANTY**

(1) If, within one year after the date of Substantial Completion of the Work or each designated portion of the Work (or otherwise as agreed upon in a mutually-executed Certificate of Substantial Completion), any of the Work is found to be Defective Work, the Contractor shall promptly upon receipt of written notice from the Owner or Architect, and without expense to either, replace or correct the Defective Work to conform to the requirements of the Contract Documents, and repair all damage to the site, the building and its contents which is the result of Defective Work or its replacement or correction.

(2) The one-year warranty for punch list items shall begin on the Date of Substantial Completion if they are completed or corrected within the time period allowed in the Certificate of Substantial



Completion in which they are recorded. The one-year warranty for punch list items that are not completed or corrected within the time period allowed in the Certificate of Substantial Completion, and other Work performed after Substantial Completion, shall begin on the date of Final Acceptance of the Work. The Contractor's correction of Work pursuant to this warranty does not extend the period of the warranty. The Contractor's one-year warranty does not apply to defects or damages due to improper or insufficient maintenance, improper operation, or wear and tear during normal usage.

(3) Upon recognizing a condition of Defective Work, the Owner shall promptly notify the Contractor of the condition. If the condition is causing damage to the building, its contents, equipment, or site, the Owner shall take reasonable actions to mitigate the damage or its continuation, if practical. If the Contractor fails to proceed promptly to comply with the terms of the warranty, or to provide the Owner with satisfactory written verification that positive action is in process, the Owner may have the Defective Work replaced or corrected and the Contractor and the Contractor's Surety shall be liable for all expense incurred.

(4) **Year-end Inspection(s):** An inspection of the Work, or each separately completed portion thereof, is required near the end of the Contractor's one-year warranty period(s). The inspection must be scheduled with the Owner, Architect and DCM Inspector. The subsequent delivery of the Architect's report of a Year-end Inspection will serve as confirmation that the Contractor was notified of Defective Work found within the warranty period.

(5) The Contractor's warranty of one year is in addition to, and not a limitation of, any other remedy stated herein or available to the Owner under applicable law.

## **C. GENERAL CONTRACTOR'S ROOFING GUARANTEE**

(1) In addition to any other roof related warranties or guarantees that may be specified in the Contract Documents, the roof and associated work shall be guaranteed by the General Contractor against leaks and defects of materials and workmanship for a period of five (5) years, starting on the Date of Substantial Completion of the Project as stated in the Certificate of Substantial Completion. This guarantee for punch list items shall begin on the Date of Substantial Completion if they are completed or corrected within the time period allowed in the Certificate of Substantial Completion in which they are recorded. The guarantee for punch list items that are not completed or corrected within the time period allowed in the Certificate of Substantial Completion shall begin on the date of Final Acceptance of the Work.

(2) The "General Contractor's Roofing Guarantee" (DCM Form C-9), included in the Project Manual, shall be executed in triplicate, signed by the appropriate party and submitted to the Architect for submission with the Certificate of Substantial Completion to the Owner and the Division of Construction Management.

(3) This guarantee does not include costs which might be incurred by the General Contractor in making visits to the site requested by the Owner regarding roof problems that are due to lack of proper maintenance (keeping roof drains and/or gutters clear of debris that cause a stoppage of drainage which results in water ponding, overflowing of flashing, etc.), or damages caused by vandalism or misuse of roof areas. Should the contractor be required to return to the job to correct problems of this nature that are determined not to be related to faulty workmanship and materials in the installation of the roof, payment for actions taken by the Contractor in response to such request will be the responsibility of the Owner. A detailed written report shall be made by the General

Contractor on each of these 'Service Calls' with copies to the Architect, Owner and Division of Construction Management.

**D. SPECIAL WARRANTIES**

(1) The Contractor shall deliver to the Owner through the Architect all special or extended warranties required by the Contract Documents from the Contractor, Subcontractors, and suppliers.

(2) The Contractor and the Contractor's Surety shall be liable to the Owner for such special warranties during the Contractor's one-year warranty; thereafter, the Contractor's obligations relative to such special warranties shall be to provide reasonable assistance to the Owner in their enforcement.

**E. ASSUMPTION of GUARANTEES of OTHERS**

If the Contractor disturbs, alters, or damages any work guaranteed under a separate contract, thereby voiding the guarantee of that work, the Contractor shall restore the work to a condition satisfactory to the Owner and shall also guarantee it to the same extent that it was guaranteed under the separate contract.

**ARTICLE 36  
INDEMNIFICATION AGREEMENT**

To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, Architect, Architect's consultants, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, employees, and consultants (hereinafter collectively referred to as the "Indemnitees") from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of, related to, or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including loss of use resulting therefrom, and is caused in whole or in part by negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether such claim, damage, loss or expense is caused in part, or is alleged but not legally established to have been caused in whole or in part by the negligence or other fault of a party indemnified hereunder.

- A. This indemnification shall extend to all claims, damages, losses and expenses for injury or damage to adjacent or neighboring property, or persons injured thereon, that arise out of, relate to, or result from performance of the Work.
- B. This indemnification does not extend to the liability of the Architect, or the Architect's Consultants, agents, or employees, arising out of (1) the preparation or approval of maps, shop drawings, opinions, reports, surveys, field orders, Change Orders, drawings or specifications, or (2) the giving of or the failure to give directions or instructions, provided such giving or failure to give instructions is the primary cause of the injury or damage.
- C. This indemnification does not apply to the extent of the sole negligence of the Indemnitees.

**ARTICLE 37**  
**CONTRACTOR'S and SUBCONTRACTORS' INSURANCE**

*(Provide entire Article 37 to Contractor's insurance representative.)*

**A. GENERAL**

**(1) RESPONSIBILITY.** The Contractor shall be responsible to the Owner from the time of the signing of the Construction Contract or from the beginning of the first work, whichever shall be earlier, for all injury or damage of any kind resulting from any negligent act or omission or breach, failure or other default regarding the work by the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of who may be the owner of the property.

**(2) INSURANCE PROVIDERS.** Each of the insurance coverages required below shall be issued by an insurer licensed by the Insurance Commissioner to transact the business of insurance in the State of Alabama for the applicable line of insurance, and such insurer (or, for qualified self-insureds or group self-insureds, a specific excess insurer providing statutory limits) must have a Best Policyholders Rating of "A-" or better and a financial size rating of Class V or larger.

**(3) NOTIFICATION ENDORSEMENT.** Each policy shall be endorsed to provide that the insurance company agrees that the policy shall not be canceled, changed, allowed to lapse or allowed to expire for any reason until thirty days after the Owner has received written notice by certified mail as evidenced by return receipt or until such time as other insurance coverage providing protection equal to protection called for in the Contract Documents shall have been received, accepted and acknowledged by the Owner. Such notice shall be valid only as to the Project as shall have been designated by Project Name and Number in said notice.

**(4) INSURANCE CERTIFICATES.** The Contractor shall procure the insurance coverages identified below, or as otherwise required in the Contract Documents, at the Contractor's own expense, and to evidence that such insurance coverages are in effect, the Contractor shall furnish the Owner an insurance certificate(s) acceptable to the Owner and listing the Owner as the certificate holder. The insurance certificate(s) must be delivered to the Owner with the Construction Contract and Bonds for final approval and execution of the Construction Contract. The insurance certificate must provide the following:

- (a) Name and address of authorized agent of the insurance company
- (b) Name and address of insured
- (c) Name of insurance company or companies
- (d) Description of policies
- (e) Policy Number(s)
- (f) Policy Period(s)
- (g) Limits of liability
- (h) Name and address of Owner as certificate holder
- (i) Project Name and Number, if any
- (j) Signature of authorized agent of the insurance company
- (k) Telephone number of authorized agent of the insurance company
- (l) Mandatory thirty day notice of cancellation / non-renewal / change

**(5) MAXIMUM DEDUCTIBLE.** Self-insured retention, except for qualified self-insurers or

group self-insurers, in any policy shall not exceed \$25,000.00.

## **B. INSURANCE COVERAGES**

Unless otherwise provided in the Contract Documents, the Contractor shall purchase the types of insurance coverages with liability limits not less than as follows:

### **(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE**

(a) Workers' Compensation coverage shall be provided in accordance with the statutory coverage required in Alabama. A group insurer must submit a certificate of authority from the Alabama Department of Industrial Relations approving the group insurance plan. A self-insurer must submit a certificate from the Alabama Department of Industrial Relations stating the Contractor qualifies to pay its own workers' compensation claims.

(b) Employer's Liability Insurance limits shall be at least:

- .1 Bodily Injury by Accident - \$1,000,000 each accident
- .2 Bodily Injury by Disease - \$1,000,000 each employee

### **(2) COMMERCIAL GENERAL LIABILITY INSURANCE**

(a) Commercial General Liability Insurance, written on an ISO Occurrence Form (current edition as of the date of Advertisement for Bids) or equivalent, shall include, but need not be limited to, coverage for bodily injury and property damage arising from premises and operations liability, products and completed operations liability, blasting and explosion, collapse of structures, underground damage, personal injury liability and contractual liability. The Commercial General Liability Insurance shall provide at minimum the following limits:

<b><u>Coverage</u></b>	<b><u>Limit</u></b>
.1 General Aggregate	\$ 2,000,000.00 per Project
.2 Products, Completed Operations Aggregate	\$ 2,000,000.00 per Project
.3 Personal and Advertising Injury	\$ 1,000,000.00 per Occurrence
.4 Each Occurrence	\$ 1,000,000.00

(b) Additional Requirements for Commercial General Liability Insurance:

- .1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants and employees as additional insureds, state that this coverage shall be primary insurance for the additional insureds; and contain no exclusions of the additional insureds relative to job accidents.
- .2 The policy must include separate per project aggregate limits.

### **(3) COMMERCIAL BUSINESS AUTOMOBILE LIABILITY INSURANCE**

(a) Commercial Business Automobile Liability Insurance which shall include coverage for bodily injury and property damage arising from the operation of any owned, non-owned or hired automobile. The Commercial Business Automobile Liability Insurance Policy shall provide not less than \$1,000,000 Combined Single Limits for each occurrence.

(b) The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

### **(4) COMMERCIAL UMBRELLA OR COMMERCIAL EXCESS LIABILITY INSURANCE**

(a) Commercial Umbrella or Commercial Excess Liability Insurance to provide excess

coverage above the Commercial General Liability, Commercial Business Automobile Liability and the Workers' Compensation and Employer's Liability to satisfy the minimum limits set forth herein.

**(b) Minimum Combined Primary Commercial General Liability and Commercial Umbrella or Commercial Excess Limits of:**

.1 \$ 5,000,000 per Occurrence

.2 \$ 5,000,000 Aggregate

**(c) Additional Requirements for Commercial Umbrella or Commercial Excess Liability Insurance:**

.1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

.2 The policy must be on an "occurrence" basis.

**(5) BUILDER'S RISK INSURANCE**

**(a)** The Builder's Risk Policy shall be made payable to the Owner and Contractor, as their interests may appear. The policy amount shall be equal to 100% of the Contract Sum, written on a Causes of Loss - Special Form (current edition as of the date of Advertisement for Bids), or its equivalent. All deductibles shall be the sole responsibility of the Contractor.

**(b)** The policy shall be endorsed as follows:

"The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy:

(i) Furniture and equipment may be delivered to the insured premises and installed in place ready for use; or

(ii) Partial or complete occupancy by Owner; or

(iii) Performance of work in connection with construction operations insured by the Owner, by agents or lessees or other contractors of the Owner, or by contractors of the lessee of the Owner."

**C. SUBCONTRACTORS' INSURANCE**

**(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE.** The Contractor shall require each Subcontractor to obtain and maintain Workers' Compensation and Employer's Liability Insurance coverages as described in preceding Paragraph B, or to be covered by the Contractor's Workers' Compensation and Employer's Liability Insurance while performing Work under the Contract.

**(2) LIABILITY INSURANCE.** The Contractor shall require each Subcontractor to obtain and maintain adequate General Liability, Automobile Liability, and Umbrella or Excess Liability Insurance coverages similar to those described in preceding Paragraph B. Such coverage shall be in effect at all times that a Subcontractor is performing Work under the Contract.

**(3) ENFORCEMENT RESPONSIBILITY.** The Contractor shall have responsibility to enforce its Subcontractors' compliance with these or similar insurance requirements; however, the Contractor shall, upon request, provide the Architect or Owner acceptable evidence of insurance for any Subcontractor.

**D. TERMINATION of OBLIGATION to INSURE**

Unless otherwise expressly provided in the Contract Documents, the obligation to insure as

provided herein shall continue as follows:

**(1) BUILDER'S RISK INSURANCE.** The obligation to insure under Subparagraph B(5) shall remain in effect until the Date of Substantial Completion as shall be established in the Certificate of Substantial Completion. In the event that multiple Certificates of Substantial Completion covering designated portions of the Work are issued, Builder's Risk coverage shall remain in effect until the Date of Substantial Completion as shall be established in the last issued Certificate of Substantial Completion. However, in the case that the Work involves separate buildings, Builder's Risk coverage of each separate building may terminate on the Date of Substantial Completion as established in the Certificate of Substantial Completion issued for each building.

**(2) PRODUCTS and COMPLETED OPERATIONS.** The obligation to carry Products and Completed Operations coverage specified under Subparagraph B(2) shall remain in effect for two years after the Date(s) of Substantial Completion.

**(3) ALL OTHER INSURANCE.** The obligation to carry other insurance coverages specified under Subparagraphs B(1) through B(4) and Paragraph C shall remain in effect after the Date(s) of Substantial Completion until such time as all Work required by the Contract Documents is completed. Equal or similar insurance coverages shall remain in effect if, after completion of the Work, the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, returns to the Project to perform warranty or maintenance work pursuant to the terms of the Contract Documents.

**E. WAIVERS of SUBROGATION**

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors performing construction or operations related to the Project, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss. But said waiver shall apply only to the extent the loss or damage is covered by builder's risk insurance applicable to the Work or to other property located within or adjacent to the Project, except such rights as they may have to proceeds of such insurance held by the Owner or Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, if any, and the subcontractor, sub-subcontractors, suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The Policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to the person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. The waivers provided for in this paragraph shall not be applicable to loss or damage that occurs after final acceptance of the Work.

**ARTICLE 38**  
**PERFORMANCE and PAYMENT BONDS**

**A. GENERAL**

Upon signing and returning the Construction Contract to the Owner for final approval and execution, the Contractor shall, at the Contractor's expense, furnish to the Owner a Performance

Bond and a Payment Bond (P&P Bonds), DCM Forms C-6 and C-7 as contained in the Project Manual, each in a penal sum equal to 100% of the Contract Sum. Each bond shall be on the form contained in the Project Manual, shall be executed by a surety company (Surety) acceptable to the Owner and duly authorized and qualified to make such bonds in the State of Alabama in the required amount. There shall be three original P&P Bonds submitted with original signatures for each of the three contracts required. The P&P bonds must be signed either on the same day or after the construction contract date. Each P&P Bond shall have attached thereto an original power of attorney (POA) of the signing official. The POA signature date must be the same day as the P&P Bond's signature date. All signatures must be present.

The provisions of this Article are not applicable to this Contract if the Contract Sum is less than \$50,000, unless bonds are required for this Contract in the Supplemental General Conditions.

**B. PERFORMANCE BOND**

Through the Performance Bond, the Surety's obligation to the Owner shall be to assure the prompt and faithful performance of the Contract and Contract Change Orders. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. In case of default on the part of the Contractor, the Surety shall take charge of and complete the Work in accordance with the terms of the Performance Bond. Any reasonable expenses incurred by the Owner as a result of default on the part of the Contractor, including architectural, engineering, administrative, and legal services, shall be recoverable under the Performance Bond.

**C. PAYMENT BOND**

Through the Payment Bond the Surety's obligation to the Owner shall be to guarantee that the Contractor and its Subcontractors shall promptly make payment to all persons supplying labor, materials, or supplies for, or in, the prosecution of the Work, including the payment of reasonable attorneys fees incurred by successful claimants or plaintiffs in civil actions on the Bond. Any person or entity indicating that they have a claim of nonpayment under the Bond shall, upon written request, be promptly furnished a certified copy of the Bond and Construction Contract by the Contractor, Architect, Owner, or Alabama Division of Construction Management, whomever is recipient of the request.

**D. CHANGE ORDERS**

The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. All Contract Change Orders involving an increase in the Contract Sum will require consent of Surety by endorsement of the Contract Change Order form. The Surety waives notification of any Contract Change Orders involving only extension of the Contract Time.

**E. EXPIRATION**

The obligations of the Contractor's performance bond surety shall be coextensive with the contractor's performance obligations under the Contract Documents; provided, however, that the surety's obligation shall expire at the end of the one-year warranty period(s) of Article 35.

**ARTICLE 39**  
**ASSIGNMENT**

The Contractor shall not assign the Contract or sublet it as a whole nor assign any moneys due or to become due to the Contractor thereunder without the previous written consent of the Owner (and of the Surety, in the case of a bonded Construction Contract). As prescribed by the Public Works Law, the Contract shall in no event be assigned to an unsuccessful bidder for the Contract whose bid was rejected because the bidder was not a responsible or responsive bidder.

## **ARTICLE 40**

### **CONSTRUCTION by OWNER or SEPARATE CONTRACTORS**

#### **A. OWNER'S RESERVATION of RIGHT**

(1) The Owner reserves the right to self-perform, or to award separate contracts for, other portions of the Project and other Project related construction and operations on the site. The contractual conditions of such separate contracts shall be substantially similar to those of this Contract, including insurance requirements and the provisions of this Article. If the Contractor considers such actions to involve delay or additional cost under this Contract, notifications and assertion of claims shall be as provided in Article 20 and Article 23.

(2) When separate contracts are awarded, the term "Contractor" in the separate Contract Documents shall mean the Contractor who executes the respective Construction Contract.

#### **B. COORDINATION**

Unless otherwise provided in the Contract Documents, the Owner shall be responsible for coordinating the activities of the Owner's forces and separate contractors with the Work of the Contractor. The Contractor shall cooperate with the Owner and separate contractors, shall participate in reviewing and comparing their construction schedules relative to that of the Contractor when directed to do so, and shall make and adhere to any revisions to the construction schedule resulting from a joint review and mutual agreement.

#### **C. CONDITIONS APPLICABLE to WORK PERFORMED by OWNER**

Unless otherwise provided in the Contract Documents, when the Owner self-performs construction or operations related to the Project, the Owner shall be subject to the same obligations to Contractor as Contractor would have to a separate contractor under the provision of this Article 40.

#### **D. MUTUAL RESPONSIBILITY**

(1) The Contractor shall reasonably accommodate the required introduction and storage of materials and equipment and performance of activities by the Owner and separate contractors and shall connect and coordinate the Contractor's Work with theirs as required by the Contract Documents.

(2) By proceeding with an element or portion of the Work that is applied to or performed on construction by the Owner or a separate contractor, or which relies upon their operations, the Contractor accepts the condition of such construction or operations as being suitable for the Contractor's Work, except for conditions that are not reasonably discoverable by the Contractor. If the Contractor discovers any condition in such construction or operations that is not suitable for the



proper performance of the Work, the Contractor shall not proceed, but shall instead promptly notify the Architect in writing of the condition discovered.

(3) The Contractor shall reimburse the Owner for any costs incurred by a separate contractor and payable by the Owner because of acts or omissions of the Contractor. Likewise, the Owner shall be responsible to the Contractor for any costs incurred by the Contractor because of the acts or omissions of a separate contractor.

(4) The Contractor shall not cut or otherwise alter construction by the Owner or a separate contractor without the written consent of the Owner and separate contractor; such consent shall not be unreasonably withheld. Likewise, the Contractor shall not unreasonably withhold its consent allowing the Owner or a separate contractor to cut or otherwise alter the Work.

(5) The Contractor shall promptly remedy any damage caused by the Contractor to the construction or property of the Owner or separate contractors.

#### **ARTICLE 41** **SUBCONTRACTS**

##### **A. AWARD of SUBCONTRACTS and OTHER CONTRACTS for PORTIONS of the WORK**

(1) Unless otherwise provided in the Contract Documents, when delivering the executed Construction Contract, bonds, and evidence of insurance to the Architect, the Contractor shall also submit a listing of Subcontractors proposed for each principal portion of the Work and fabricators or suppliers proposed for furnishing materials or equipment fabricated to the design of the Contract Documents. This listing shall be in addition to any naming of Subcontractors, fabricators, or suppliers that may have been required in the bid process. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner, after due investigation, has reasonable objection to any Subcontractor, fabricator, or supplier proposed by the Contractor. The issuance of the Notice to Proceed in the absence of such objection by the Owner shall constitute notice that no reasonable objection to them is made.

(2) The Contractor shall not contract with a proposed Subcontractor, fabricator, or supplier to whom the Owner has made reasonable and timely objection. Except in accordance with prequalification procedures as may be contained in the Contract Documents, through specified qualifications, or on the grounds of reasonable objection, the Owner may not restrict the Contractor's selection of Subcontractors, fabricators, or suppliers.

(3) Upon the Owner's reasonable objection to a proposed Subcontractor, fabricator, or supplier, the Contractor shall promptly propose another to whom the Owner has no reasonable objection. If the proposed Subcontractor, fabricator, or supplier to whom the Owner made reasonable objection was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be equitably adjusted by Contract Change Order for any resulting difference if the Contractor has acted promptly and responsively in this procedure.

(4) The Contractor shall not change previously selected Subcontractors, fabricators, or suppliers without notifying the Architect and Owner in writing of proposed substitute Subcontractors, fabricators, or suppliers. If the Owner does not make a reasonable objection to a proposed substitute within three working days, the substitute shall be deemed approved.

**B. SUBCONTRACTUAL RELATIONS**

(1) The Contractor agrees to bind every Subcontractor and material supplier (and require every Subcontractor to so bind its subcontractors and material suppliers) to all the provisions of the Contract Documents as they apply to the Subcontractor's and material supplier's portion of the Work.

(2) Nothing contained in the Contract Documents shall be construed as creating any contractual relationship between any Subcontractor and the Owner, nor to create a duty of the Architect, Owner, or Director to resolve disputes between or among the Contractor or its Subcontractors and suppliers or any other duty to such Subcontractors or suppliers.

**ARTICLE 42**  
**ARCHITECT'S STATUS**

- A. The Architect is an independent contractor performing, with respect to this Contract, pursuant to an agreement executed between the Owner and the Architect. The Architect has prepared the Drawings and Specifications and assembled the Contract Document and is, therefore, charged with their interpretation and clarification as described in the Contract Documents. As a representative of the Owner, the Architect will endeavor to guard the Owner against variances from the requirements of the Contract Documents by the Contractor. On behalf of the Owner, the Architect will administer the Contract as described in the Contract Documents during construction and the Contractor's one-year warranty.
- B. So as to maintain continuity in administration of the Contract and performance of the Work, and to facilitate complete documentation of the project record, all communications between the Contractor and Owner regarding matters of or related to the Contract shall be directed through the Architect, unless direct communication is otherwise required to provide a legal notification. Unless otherwise authorized by the Architect, communications by and with the Architect's consultants shall be through the Architect. Unless otherwise authorized by the Contractor, communications by and with Subcontractors and material suppliers shall be through the Contractor.

**C. ARCHITECT'S AUTHORITY**

Subject to other provisions of the Contract Documents, the following summarizes some of the authority vested in the Architect by the Owner with respect to the Construction Contract and as further described or conditioned in other Articles of these General Conditions of the Contract.

**(1) The Architect is authorized to:**

- (a) approve "minor" deviations as defined in Article 9, Submittals,
- (b) make "minor" changes in the Work as defined in Article 19, Changes in the Work,
- (c) reject or require the correction of Defective Work,
- (d) require the Contractor to stop the performance of Defective Work,
- (e) adjust an Application for Payment by the Contractor pursuant to Article 30, Certification and Approval of payments, and
- (f) issue Notices to Cure pursuant to Article 27.

**(2) The Architect is not authorized to:**

- (a) revoke, alter, relax, or waive any requirements of the Contract Documents (other than

- “minor” deviations and changes) without concurrence of the Owner,
- (b) finally approve or accept any portion of the Work without concurrence of the Owner,
  - (c) issue instructions contrary to the Contract Documents,
  - (d) issue Notice of Termination or otherwise terminate the Contract, or
  - (e) require the Contractor to stop the Work except only to avoid the performance of Defective Work.

**D. LIMITATIONS of RESPONSIBILITIES**

- (1) The Architect shall not be responsible to Contractors or to others for supervising or coordinating the performance of the Work or for the Construction Methods or safety of the Work, unless the Contract Documents give other specific instructions concerning these matters.
- (2) The Architect will not be responsible to the Contractor (nor the Owner) for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents or for acts or omissions of the Contractor, a Subcontractor, or anyone for whose acts they may be liable. However, the Architect will report to the Owner and Contractor any Defective Work recognized by the Architect.
- (3) The Architect will endeavor to secure faithful performance by Owner and Contractor, and the Architect will not show partiality to either or be liable to either for results of interpretations or decisions rendered in good faith.
- (4) The Contractor’s remedies for additional time or expense arising out of or related to this Contract, or the breach thereof, shall be solely as provided for in the Contract Documents. The Contractor shall have no claim or cause of action against the Owner, Architect, or its consultants for any actions or failures to act, whether such claim may be in contract, tort, strict liability, or otherwise, it being the agreement of the parties that the Contractor shall make no claim against the Owner or any agents of the Owner, including the Architect or its consultants, except as may be provided for claims or disputes submitted in accordance with Article 24. The Architect and Architect’s consultants shall be considered third party beneficiaries of this provision of the Contract and entitled to enforce same.

**E. ARCHITECT’S DECISIONS**

Decisions by the Architect shall be in writing. The Architect’s decisions on matters relating to aesthetic effect will be final and binding if consistent with the intent expressed in the Contract Documents. The Architect’s decisions regarding disputes arising between the Contractor and Owner shall be advisory.

**ARTICLE 43**  
**CASH ALLOWANCES**

- A. All allowances stated in the Contract Documents shall be included in the Contract Sum. Items covered by allowances shall be supplied by the Contractor as directed by the Architect or Owner and the Contractor shall afford the Owner the economy of obtaining competitive pricing from responsible bidders for allowance items unless other purchasing procedures are specified in the Contract Documents.
- B. Unless otherwise provided in the Contract Documents:

- (1) allowances shall cover the cost to the Contractor of materials and equipment delivered to the Project site and all applicable taxes, less applicable trade discounts;
  - (2) the Contractor's costs for unloading, storing, protecting, and handling at the site, labor, installation, overhead, profit and other expenses related to materials or equipment covered by an allowance shall be included in the Contract Sum but not in the allowances;
  - (3) if required, the Contract Sum shall be adjusted by Change Order to reflect the actual costs of an allowance.
- C. Any selections of materials or equipment required of the Architect or Owner under an allowance shall be made in sufficient time to avoid delay of the Work.

## **ARTICLE 44**

### **PERMITS, LAWS, and REGULATIONS**

#### **A. PERMITS, FEES AND NOTICES**

- (1) Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work which are customarily secured after award of the Construction Contract and which are in effect on the date of receipt of bids.
- (2) The Contractor shall comply with and give notices required by all laws, ordinances, rules, regulations, and lawful orders of public authorities applicable to performance of the Work.

#### **B. TAXES**

Unless stated otherwise in the Contract Documents, materials incorporated into the Work are exempt from sales and use tax pursuant to Section 40-9-33, Code of Alabama, 1975 as amended. The Owner, Contractor and its subcontractors shall be responsible for complying with rules and regulations of the Sales, Use, & Business Tax Division of the Alabama Department of Revenue regarding certificates and other qualifications necessary to claim such exemption when making qualifying purchases from vendors. The Contractor shall pay all applicable taxes that are not covered by the exemption of Section 40-9-33 and which are imposed as of the date of receipt of bids, including those imposed as of the date of receipt of bids but scheduled to go into effect after that date.

#### **C. COMPENSATION for INCREASES**

The Contractor shall be compensated for additional costs incurred because of increases in tax rates imposed after the date of receipt of bids.

#### **D. ALABAMA IMMIGRATION LAW**

Per ACT 2011-535 as codified in Title 31, Chapter 13 of the Code of Alabama, 1975, as amended:

The contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in

violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.

**E. ALABAMA BOYCOTT LAW**

Per Act 2016-312 as codified in Title 41, Chapter 16, Article 1, of the Code of Alabama, 1975, as amended:

The contracting parties affirm, for the duration of the agreement, that they are not currently engaged in, and will not engage in, the boycott of a person or an entity based in or doing business with a jurisdiction with which this state can enjoy open trade.

**F. ACCOUNTING OF SALES TAX EXEMPT PROJECTS**

Per Act 2013-205 as codified in Title 40, Chapter 9, Article 1, of the Code of Alabama, 1975, as amended:

In bidding the work on a tax exempt project, the bid form shall provide an accounting for the tax savings.

**ARTICLE 45**  
**ROYALTIES, PATENTS, and COPYRIGHTS**

The Contractor shall pay all royalties and license fees. The Contractor shall defend, indemnify and hold harmless the Owner, Architect, Architect's consultants, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, employees, and consultants from and against all claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of, related to, or resulting from all suits or claims for infringement of any patent rights or copyrights arising out of the inclusion of any patented or copyrighted materials, methods, or systems selected by the Contractor and used during the execution of or incorporated into the Work. This indemnification does not apply to any suits or claims of infringement of any patent rights or copyrights arising out of any patented or copyrighted materials, methods, or systems specified in the Contract Documents. However, if the Contractor has information that a specified material, method, or system is or may constitute an infringement of a patent or copyright, the Contractor shall be responsible for any resulting loss unless such information is promptly furnished to the Architect.

**ARTICLE 46**  
**USE of the SITE**

- A. The Contractor shall confine its operations at the Project site to areas permitted by the Owner and by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials, equipment, employees' vehicles, or debris. The Contractor's operations at the site shall be restricted to the sole purpose of constructing the Work, use of the site as a staging, assembly, or storage area for other business which the Contractor may undertake shall not be permitted.
- B. Unless otherwise provided in the Contract Documents, temporary facilities, such as storage sheds,

shops, and offices may be erected on the Project site with the approval of the Architect and Owner. Such temporary buildings and/or utilities shall remain the property of the Contractor, and be removed at the Contractor's expense upon completion of the Work, unless the Owner authorizes their abandonment without removal.

#### **ARTICLE 47** **CUTTING and PATCHING**

- A. The Contractor shall be responsible for all cutting, fitting, or patching that may be required to execute the Work to the results indicated in the Contract Documents or to make its parts fit together properly.
- B. Any cutting, patching, or excavation by the Contractor shall be supervised and performed in a manner that will not endanger persons nor damage or endanger the Work or any fully or partially completed construction of the Owner or separate contractors.

#### **ARTICLE 48** **IN-PROGRESS and FINAL CLEANUP**

##### **A. IN-PROGRESS CLEAN-UP**

(1) The Contractor shall at all times during the progress of the Work keep the premises and surrounding area free from rubbish, scrap materials and debris resulting from the Work. Trash and combustible materials shall not be allowed to accumulate inside buildings or elsewhere on the premises. At no time shall any rubbish be thrown from window openings. Burning of trash and debris on site is not permitted.

(2) The Contractor shall make provisions to minimize and confine dust and debris resulting from construction activities.

##### **B. FINAL CLEAN-UP**

(1) Before Substantial Completion or Final Acceptance is achieved, the Contractor shall have removed from the Owner's property all construction equipment, tools, and machinery; temporary structures and/or utilities including the foundations thereof (except such as the Owner permits in writing to remain); rubbish, debris, and waste materials; and all surplus materials, leaving the site clean and true to line and grade, and the Work in a safe and clean condition, ready for use and operation.

(2) In addition to the above, and unless otherwise provided in the Contract Documents, the Contractor shall be responsible for the following special cleaning for all trades as the Work is completed:

- (a) **Cleaning of all painted, enameled, stained, or baked enamel work:** Removal of all marks, stains, finger prints and splatters from such surfaces.
- (b) **Cleaning of all glass:** Cleaning and removing of all stickers, labels, stains, and paint from all glass, and the washing and polishing of same on interior and exterior.
- (c) **Cleaning or polishing of all hardware:** Cleaning and polishing of all hardware.

**(d) Cleaning all tile, floor finish of all kinds:** Removal of all splatters, stains, paint, dirt, and dust, the washing and polishing of all floors as recommended by the manufacturer or required by the Architect.

**(e) Cleaning of all manufactured articles, materials, fixtures, appliances, and equipment:** Removal of all stickers, rust stains, labels, and temporary covers, and cleaning and conditioning of all manufactured articles, material, fixtures, appliances, and electrical, heating, and air conditioning equipment as recommended or directed by the manufacturers, unless otherwise required by the Architect; blowing out or flushing out of all foreign matter from all equipment, piping, tanks, pumps, fans, motors, devices, switches, panels, fixtures, boilers, sanitizing potable water systems; and freeing identification plates on all equipment of excess paint and the polishing thereof.

**C. OWNER'S RIGHT to CLEAN-UP**

If the Contractor fails to comply with these clean-up requirements and then fails to comply with a written directive by the Architect to clean-up the premises within a specified time, the Architect or Owner may implement appropriate clean-up measures and the cost thereof shall be deducted from any amounts due or to become due the Contractor.

**ARTICLE 49**  
**LIQUIDATED DAMAGES**

- A. Time is the essence of the Contract. Any delay in the completion of the Work required by the Contract Documents may cause inconvenience to the public and loss and damage to the Owner including but not limited to interest and additional administrative, architectural, inspection and supervision charges. By executing the Construction Contract, the Contractor agrees that the Contract Time is sufficient for the achievement of Substantial Completion.
- B. The Contract Documents may provide in the Construction Contract or elsewhere for a certain dollar amount for which the Contractor and its Surety (if any) will be liable to the Owner as liquidated damages for each calendar day after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work. If such daily liquidated damages are provided for, Owner and Contractor, and its Surety, agree that such amount is reasonable and agree to be bound thereby.
- C. If a daily liquidated damage amount is not otherwise provided for in the Contract Documents, a time charge equal to six percent interest per annum on the total Contract Sum may be made against the Contractor for the entire period after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work.
- D. The amount of liquidated damages due under either paragraph B or C, above, may be deducted by the Owner from the moneys otherwise due the Contractor in the Final Payment, not as a penalty, but as liquidated damages sustained, or the amount may be recovered from Contractor or its Surety. If part of the Work is substantially completed within the Contract Time and part is not, the stated charge for liquidated damages shall be equitably prorated to that portion of the Work that the Contractor fails to substantially complete within the Contract Time. It is mutually understood and agreed between the parties hereto that such amount is reasonable as liquidated damages.

**ARTICLE 50**  
**USE of FOREIGN MATERIALS**

- A. In the performance of the Work the Contractor agrees to use materials, supplies, and products manufactured, mined, processed or otherwise produced in the United States or its territories, if same are available at reasonable and competitive prices and are not contrary to any sole source specification implemented under the Public Works Law.
- B. In the performance of the Work the Contractor agrees to use steel produced in the United States if the Contract Documents require the use of steel and do not limit its supply to a sole source pursuant to the Public Works Law. If the Owner decides that the procurement of domestic steel products becomes impractical as a result of national emergency, national strike, or other cause, the Owner shall waive this restriction.
- C. If domestic steel or other domestic materials, supplies, and products are not used in accordance with preceding Paragraphs A and B, the Contract Sum shall be reduced by an amount equal to any savings or benefits realized by the Contractor.
- D. This Article applies only to Public Works projects financed entirely by the State of Alabama or any political subdivision of the state.

**ARTICLE 51**  
**PROJECT SIGN**

- A. Fully locally-funded State Agency and Public Higher Education projects: DCM Form C-15: Detail of Project Sign must be included in the project manual regardless of expected bid amount. If the awarded contract sum is \$100,000.00 or more, Contractor shall furnish and erect a project sign. Other conditions besides the contract sum may warrant waiver of this requirement, but only with approval of the Technical Staff.
- B. Fully locally-funded K-12 school projects: Project sign is not required unless requested by Owner; if project sign is requested by Owner, include DCM Form C-15: Detail of Project Sign in the project manual.
- C. Partially or fully PSCA-funded projects: DCM Form C-15: Detail of Project Sign must be included in the project manual. Contractor shall furnish and erect a project sign for all PSCA-funded projects, regardless of the contract sum. "Alabama Public School and College Authority" as well as the local owner entity must be included as awarding authorities on the project sign of all PSCA-funded projects.

When required per the above conditions, the project sign shall be erected in a prominent location selected by the Architect and Owner and shall be maintained in good condition until completion of Work. If the Contract involves Work on multiple sites, only one project sign is required, which shall be erected on one of the sites in a location selected by the Architect and Owner. Slogan: The title of the current PSCA Act should be placed on the project sign of all PSCA-funded projects, otherwise the Awarding Authority/Owner's slogan, if any, should be used. If the Awarding Authority/Owner of a fully locally-funded project does not have a slogan, the project sign does not require a slogan.



**ARTICLE 37**  
**CONTRACTOR'S and SUBCONTRACTORS' INSURANCE**

*(Provide entire Article 37 to Contractor's insurance representative.)*

**A. GENERAL**

**(1) RESPONSIBILITY.** The Contractor shall be responsible to the Owner from the time of the signing of the Construction Contract or from the beginning of the first work, whichever shall be earlier, for all injury or damage of any kind resulting from any negligent act or omission or breach, failure or other default regarding the work by the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of who may be the owner of the property.

**(2) INSURANCE PROVIDERS.** Each of the insurance coverages required below shall be issued by an insurer licensed by the Insurance Commissioner to transact the business of insurance in the State of Alabama for the applicable line of insurance, and such insurer (or, for qualified self-insureds or group self-insureds, a specific excess insurer providing statutory limits) must have a Best Policyholders Rating of "A-" or better and a financial size rating of Class V or larger.

**(3) NOTIFICATION ENDORSEMENT.** Each policy shall be endorsed to provide that the insurance company agrees that the policy shall not be canceled, changed, allowed to lapse or allowed to expire for any reason until thirty days after the Owner has received written notice by certified mail as evidenced by return receipt or until such time as other insurance coverage providing protection equal to protection called for in the Contract Documents shall have been received, accepted and acknowledged by the Owner. Such notice shall be valid only as to the Project as shall have been designated by Project Name and Number in said notice.

**(4) INSURANCE CERTIFICATES.** The Contractor shall procure the insurance coverages identified below, or as otherwise required in the Contract Documents, at the Contractor's own expense, and to evidence that such insurance coverages are in effect, the Contractor shall furnish the Owner an insurance certificate(s) acceptable to the Owner and listing the Owner as the certificate holder. The insurance certificate(s) must be delivered to the Owner with the Construction Contract and Bonds for final approval and execution of the Construction Contract. The insurance certificate must provide the following:

- (a) Name and address of authorized agent of the insurance company
- (b) Name and address of insured
- (c) Name of insurance company or companies
- (d) Description of policies
- (e) Policy Number(s)
- (f) Policy Period(s)
- (g) Limits of liability
- (h) Name and address of Owner as certificate holder
- (i) Project Name and Number, if any
- (j) Signature of authorized agent of the insurance company
- (k) Telephone number of authorized agent of the insurance company
- (l) Mandatory thirty day notice of cancellation / non-renewal / change

**(5) MAXIMUM DEDUCTIBLE.** Self-insured retention, except for qualified self-insurers or

group self-insurers, in any policy shall not exceed \$25,000.00.

## **B. INSURANCE COVERAGES**

Unless otherwise provided in the Contract Documents, the Contractor shall purchase the types of insurance coverages with liability limits not less than as follows:

### **(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE**

(a) Workers' Compensation coverage shall be provided in accordance with the statutory coverage required in Alabama. A group insurer must submit a certificate of authority from the Alabama Department of Industrial Relations approving the group insurance plan. A self-insurer must submit a certificate from the Alabama Department of Industrial Relations stating the Contractor qualifies to pay its own workers' compensation claims.

(b) Employer's Liability Insurance limits shall be at least:

- .1 Bodily Injury by Accident - \$1,000,000 each accident
- .2 Bodily Injury by Disease - \$1,000,000 each employee

### **(2) COMMERCIAL GENERAL LIABILITY INSURANCE**

(a) Commercial General Liability Insurance, written on an ISO Occurrence Form (current edition as of the date of Advertisement for Bids) or equivalent, shall include, but need not be limited to, coverage for bodily injury and property damage arising from premises and operations liability, products and completed operations liability, blasting and explosion, collapse of structures, underground damage, personal injury liability and contractual liability. The Commercial General Liability Insurance shall provide at minimum the following limits:

<u>Coverage</u>	<u>Limit</u>
.1 General Aggregate	\$ 2,000,000.00 per Project
.2 Products, Completed Operations Aggregate	\$ 2,000,000.00 per Project
.3 Personal and Advertising Injury	\$ 1,000,000.00 per Occurrence
.4 Each Occurrence	\$ 1,000,000.00

(b) Additional Requirements for Commercial General Liability Insurance:

- .1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants and employees as additional insureds, state that this coverage shall be primary insurance for the additional insureds; and contain no exclusions of the additional insureds relative to job accidents.
- .2 The policy must include separate per project aggregate limits.

### **(3) COMMERCIAL BUSINESS AUTOMOBILE LIABILITY INSURANCE**

(a) Commercial Business Automobile Liability Insurance which shall include coverage for bodily injury and property damage arising from the operation of any owned, non-owned or hired automobile. The Commercial Business Automobile Liability Insurance Policy shall provide not less than \$1,000,000 Combined Single Limits for each occurrence.

(b) The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

### **(4) COMMERCIAL UMBRELLA OR COMMERCIAL EXCESS LIABILITY INSURANCE**

(a) Commercial Umbrella or Commercial Excess Liability Insurance to provide excess

coverage above the Commercial General Liability, Commercial Business Automobile Liability and the Workers' Compensation and Employer's Liability to satisfy the minimum limits set forth herein.

**(b) Minimum Combined Primary Commercial General Liability and Commercial Umbrella or Commercial Excess Limits of:**

.1 \$ 5,000,000 per Occurrence

.2 \$ 5,000,000 Aggregate

**(c) Additional Requirements for Commercial Umbrella or Commercial Excess Liability Insurance:**

.1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

.2 The policy must be on an "occurrence" basis.

**(5) BUILDER'S RISK INSURANCE**

**(a)** The Builder's Risk Policy shall be made payable to the Owner and Contractor, as their interests may appear. The policy amount shall be equal to 100% of the Contract Sum, written on a Causes of Loss - Special Form (current edition as of the date of Advertisement for Bids), or its equivalent. All deductibles shall be the sole responsibility of the Contractor.

**(b)** The policy shall be endorsed as follows:

"The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy:

(i) Furniture and equipment may be delivered to the insured premises and installed in place ready for use; or

(ii) Partial or complete occupancy by Owner; or

(iii) Performance of work in connection with construction operations insured by the Owner, by agents or lessees or other contractors of the Owner, or by contractors of the lessee of the Owner."

**C. SUBCONTRACTORS' INSURANCE**

**(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE.** The Contractor shall require each Subcontractor to obtain and maintain Workers' Compensation and Employer's Liability Insurance coverages as described in preceding Paragraph B, or to be covered by the Contractor's Workers' Compensation and Employer's Liability Insurance while performing Work under the Contract.

**(2) LIABILITY INSURANCE.** The Contractor shall require each Subcontractor to obtain and maintain adequate General Liability, Automobile Liability, and Umbrella or Excess Liability Insurance coverages similar to those described in preceding Paragraph B. Such coverage shall be in effect at all times that a Subcontractor is performing Work under the Contract.

**(3) ENFORCEMENT RESPONSIBILITY.** The Contractor shall have responsibility to enforce its Subcontractors' compliance with these or similar insurance requirements; however, the Contractor shall, upon request, provide the Architect or Owner acceptable evidence of insurance for any Subcontractor.

**D. TERMINATION of OBLIGATION to INSURE**

Unless otherwise expressly provided in the Contract Documents, the obligation to insure as

provided herein shall continue as follows:

**(1) BUILDER'S RISK INSURANCE.** The obligation to insure under Subparagraph B(5) shall remain in effect until the Date of Substantial Completion as shall be established in the Certificate of Substantial Completion. In the event that multiple Certificates of Substantial Completion covering designated portions of the Work are issued, Builder's Risk coverage shall remain in effect until the Date of Substantial Completion as shall be established in the last issued Certificate of Substantial Completion. However, in the case that the Work involves separate buildings, Builder's Risk coverage of each separate building may terminate on the Date of Substantial Completion as established in the Certificate of Substantial Completion issued for each building.

**(2) PRODUCTS and COMPLETED OPERATIONS.** The obligation to carry Products and Completed Operations coverage specified under Subparagraph B(2) shall remain in effect for two years after the Date(s) of Substantial Completion.

**(3) ALL OTHER INSURANCE.** The obligation to carry other insurance coverages specified under Subparagraphs B(1) through B(4) and Paragraph C shall remain in effect after the Date(s) of Substantial Completion until such time as all Work required by the Contract Documents is completed. Equal or similar insurance coverages shall remain in effect if, after completion of the Work, the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, returns to the Project to perform warranty or maintenance work pursuant to the terms of the Contract Documents.

**E. WAIVERS of SUBROGATION**

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors performing construction or operations related to the Project, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss. But said waiver shall apply only to the extent the loss or damage is covered by builder's risk insurance applicable to the Work or to other property located within or adjacent to the Project, except such rights as they may have to proceeds of such insurance held by the Owner or Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, if any, and the subcontractor, sub-subcontractors, suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The Policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to the person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. The waivers provided for in this paragraph shall not be applicable to loss or damage that occurs after final acceptance of the Work.

**ARTICLE 38**  
**PERFORMANCE and PAYMENT BONDS**

**A. GENERAL**

Upon signing and returning the Construction Contract to the Owner for final approval and execution, the Contractor shall, at the Contractor's expense, furnish to the Owner a Performance

## SUPPLEMENT TO THE GENERAL CONDITIONS OF THE CONTRACT

- 1.1 The following supplements shall modify, delete and/or add to the General Conditions of the Contract. Where any article, paragraph or subparagraph in the General Conditions is supplemented by one of the following paragraphs, the provisions of such article, paragraph, or subparagraph shall remain in effect and the supplemental provisions shall be considered as added thereto. Where any article, paragraph or subparagraph in the General Conditions is amended, voided or superseded by any of the following paragraphs, the provisions of such article, paragraph or subparagraph not so amended, voided or superseded shall remain in effect.

A. **Refer to Article 2.A; Definition:**

1. Architect: Construction documents for this project have been developed by **McKee and Associates, Architects**, 631 South Hull Street, Montgomery, Alabama, 36104, (334) 834-9933 `commissioned by the Owner.
2. Owner: **Baldwin County Board of Education**. Unless otherwise stated, all papers required to be delivered to the Owner shall be forwarded through the Architect.

B. **Refer to Article 6;**

1. Add the following to Paragraph B:
  - a. The lowest bidding Contractor shall submit to the Architect within five (5) calendar days after the bid date the name(s) of the Superintendent(s) who will be in charge at the work site, along with the qualifications and experience.
  - b. NOTE: By submission of a Proposal the Bidder agrees that the Owner or Architect may reject a proposed Superintendent with or without a stated reason with no recourse to the Contractor.

C. **Refer to Article 6;**

1. Add the following to Paragraph C:
  - a. All labor shall be performed in the best and most workmanlike manner by persons skilled in their respective assignments or trades. Workmen whose work is unsatisfactory to the Architect or the Owner, or who are considered unfit or unskilled, or otherwise objectionable, shall be dismissed upon notice from the Architect or Owner.

D. **Refer to Article 9, Paragraph D;**

1. Add the following:
  - a. All submittals for color selections, to be made by the Architect for the entire project shall be submitted at the same time within 45 days from the "Notice to Proceed". Piece-meal submittals for color selection will not be permitted.
  - b. Provide as follows unless otherwise specified:
    - 1) All submittals shall be sent to the Architect no later than 45 calendar days from "Notice To Proceed" to: [andersong@mckeeassoc.com](mailto:andersong@mckeeassoc.com)
    - 2) Submittals regarding mechanical, plumbing, electrical and structural items shall be sent directly to the Engineer of record (see cover sheet of the specification for address). A digital copy of the transmittal shall be sent to the Architect at the following email address: [andersong@mckeeassoc.com](mailto:andersong@mckeeassoc.com)

E. **Refer to Article 13;**

1. Add the following:
  - a. "If the bidder desires to substitute an "equal", he must secure written approval by the Architect of qualification to bid ten (10) days prior to date.
  - b. On all items specified as or equal substitutions must be submitted to the Architect ten (10) days prior to bid opening and Architect will act on substitution five (5) days prior to bids and

notify all Contractors.

- c. The request for substitutions are to be filled out completely and must be received prior to bid. Any subcontractor and/or material supplier that was not "approved" and their price is used at bid time will be the Contractors problem to absorb any cost associated with the use of a "non-approved material or equipment. If the "approval" is not listed in the addendum, then the "approval" is not accepted.

**F. Refer to Article 15:**

1. The General Contractor shall be solely responsible for all requirements under this Article.

**G. Refer to Article 29, PROGRESS PAYMENTS, paragraph "B", Schedule of Values:**

1. Amend Paragraph as follows:
  - a. "Within ten days after receiving the Notice to Proceed the contractor shall submit to the Architect a DCM Form C-10SOV, Schedule of Values, which is a breakdown of the Contract Sum showing the value '**and category of Work with Subcontractor name(s)**' of the various parts of the Work for billing purposes."
2. Add the following:
  - a. The Contractor shall list the Category of Work with the Subcontractor name(s) attributable to each line item value in the column "B", "Description of Work" line(s) of the DCM Form C-10SOV, Schedule of Values.
3. Add the following:
  - a. Values shall be broken down within principal contracts in amounts not greater than \$30,000, but in no case greater than 5 percent of the Contract Sum.

**H. Refer to Article 32, SUBSTANTIAL COMPLETION**

1. Add the following:
  - a. All manufactures warranties shall commence on the date as set forth on the Substantial Completion Form, no exceptions.
  - b. Contractor shall furnish to the Architect a written letter of "notification" that all "Punch List" items have been completed prior to re-inspection.

**I. Refer to Article 35, paragraph "D", Special Warranties:**

1. Change as follows:
  - a. The Contractor shall deliver to the Owner through the Architect all special or extended warranties required by the Contract Documents from the Contractor, Subcontractors, and suppliers.

**J. Refer to Article 37:**

1. The Architect shall not be liable for any damage or injury to property or any person or persons arising from the presence of/or effects of any hazardous materials or hazardous elements in any state of form in connection with the work under this Contract. All such liability shall lie with the Contractor.
2. **ADD the following to Subparagraph B(5) "Builders Risk Insurance":**  
**As part of the General Contractors Builder's Risk, the General Contractor shall include in his Base Bid a 5% deductible allowance against wind damage during the construction of the building. This amount shall be refunded to the Owner if unused at the end of the construction project.**

**K. Refer to Article 44:**

1. Add the following: All work on this project shall be performed in accordance with the following codes:
  - a. 2010 ADA Standards For Accessible Design

- b. 2015 International Building Code
- c. 2015 International Plumbing Code
- d. 2015 International Mechanical Code
- e. 2015 International Fuel Gas Code
- f. 2015 International Fire Code
- g. 2014 National Electrical Code
- h. 2013 National Fire Alarm and Signaling Code
- i. ANSI/ASHRAE/IESNA Standard 90.1-2013 Energy Standard for Buildings Except Low-Rise Residential

L. **Refer to Article 49:**

1. Liquidated damages will be assessed at a rate of 6% per annum.
2. If this contract extends thirty (30) days past Schedule Completion Date, Owner shall deduct from the Contractor's final payment, a sum equal to the additional expense incurred by the Owner for the Architect for contract administration past scheduled completion date.

**END OF SECTION**

Supplemental Accounting Requirement – Additions to Elberta High School 23.192

Prior to starting construction, the contractor shall provide the following breakdown of the various areas and value of the construction in each of the total project cost. Pay application number 1 can not be paid until this information is received.

Elberta Weight Equipment (see Allowance) \_\_\_\_\_

Elberta Stadium Field Turf \_\_\_\_\_

Elberta Multi-Purpose Facility \_\_\_\_\_

Elberta Restrooms (not including shell of building) \_\_\_\_\_

Elberta Stadium Bleachers, Stadium Fencing, Sidewalks and Field Drainage \_\_\_\_\_



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Elberta Multi-Purpose Facility \_\_\_\_\_

Elberta Restrooms (not including shell of building) \_\_\_\_\_

Elberta Stadium Bleachers, Stadium Fencing, Sidewalks and Field Drainage \_\_\_\_\_

DCM (BC) No. \_\_\_\_\_

PSCA Projects: PSCA No. \_\_\_\_\_

Application No. \_\_\_\_\_

Date: \_\_\_\_\_

# APPLICATION and CERTIFICATE for PAYMENT

Attach DCM Form C-10SOV: Schedule of Values

<b>TO OWNER:</b> Entity Name: _____ Address: _____	<b>PROJECT:</b> _____ _____ _____
<b>FROM CONTRACTOR:</b> Company Name & Address, which must exactly match co. name & payment address spelling as registered in State of AL Accounting & Resource System (STAARS) or AL Buys to avoid rejection: STAARS or AL Buys Vendor #: _____	<b>ARCHITECT / ENGINEER:</b> Firm Name: _____ Address: _____ _____ _____

A. Total Original Contract	\$ _____	
B. Fully Executed (fully signed) Change Order(s) Numbers ____ through ____	+\$ _____	
C. Total Contract To Date	\$ _____	
<hr/>		
1. Work Completed to Date per attached Schedule of Values <i>(Form C-10SOV's Column F Total)</i>	\$ _____	
2. Materials Presently Stored <i>(When this amount is greater than \$0.00, attach Form C-10SM: Inventory of Stored Materials, or similar list)</i>	+\$ _____	
3. Total Work Completed to Date & Materials Presently Stored <i>(_____% of Contract To Date)</i>	\$ _____	
4. Less Retainage <i>(If Total Work Completed to Date &amp; Materials Presently Stored (#3) is less than or equal to 50% of Total Contract to Date (C), Retainage = #3 x 0.05. Once #3 exceeds 50% of C and up until project is complete, Retainage = C x 0.025. \$0 is retained on final payment application, see last bullet point below Instructions.)</i>	-\$ _____	Final pay app? Yes.
5. Total Due	\$ _____	
6. Less Total Previous Payments Billed <i>(Must exactly match #5 Total Due from previous payment application. # 6 is \$0.00 if there is no previous payment application)</i>	-\$ _____	
7. Balance Due This Estimate	\$ _____	

<b>CONTRACTOR'S CERTIFICATION</b> The undersigned Contractor certifies that to the best of his knowledge, information, and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by him for Work for which previous Certificates for Payments were issued and payments received from the Owner and that current payment shown herein has not yet been received.  By: _____ Date: _____ Contractor's Signature  Name & Title _____  Sworn and subscribed before me this _____ day of _____ Month, Year Seal: _____  Notary Public's Signature _____	<b>ARCHITECT'S / ENGINEER'S CERTIFICATION</b> In accordance with the Contract Documents, the Architect/ Engineer certifies to the Owner that, to the best of the Architect's/ Engineer's knowledge and belief, the Work has progressed to the point indicated herein, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the amount approved.  By _____ Architect's / Engineer's Signature  Name & Title _____  Date _____
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<b>INSTRUCTIONS</b> <ul style="list-style-type: none"> <li>• PSCA-funded projects, and State Agency-owned projects: Two copies of pay. app., each with original signatures and all attachments required.</li> <li>• Date of first payment application cannot precede the Notice to Proceed's Begin Date.</li> <li>• Pay. app. must exactly match an attached DCM Form C-10SOV: Schedule of Values.</li> <li>• A change order must be fully executed before inclusion on a payment application.</li> <li>• Contractor's signature date cannot precede the payment application date.</li> <li>• Contractor and Notary signee dates must match.</li> <li>• Progress schedules must be included with non-final payment applications.</li> <li>• One payment application per month may be submitted.</li> <li>• On a final payment application, the following is required for release of retainage: all change orders must be fully executed (signed by all parties and approval authorities) and included in B., the Certificate of Substantial Completion for entire work is fully executed, and all other close-out requirements per General Conditions Article 34 are completed.</li> </ul>	<b>APPROVAL</b>  _____ Owner Entity  By _____ Signature  Name & Title _____  Date _____
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# SCHEDULE OF VALUES (SOV)

DCM Form C-10SOV  
Revised October 2021

Project:						DCM (BC) Project Number:			
						PSCA Project Number, if any:			
Contractor Company:						Application Number:			
						Application Date:			
						Period From:		Period To:	
A	B	C	D	E	F	G	H	I	J
Item No.	Description of Work	Scheduled Value (including fully executed [signed by all parties] change order amounts)	Work Completed		Total Work Completed to Date (This application SOV's D + E)	Materials Presently Stored (G total greater than \$0 must match C-10SM's column E total. This SOV's G amounts are not in this SOV's D nor E amounts.)	Total Work Completed to Date & Materials Presently Stored (This SOV's F + G)	Percent of Contract Completed to Date (This SOV's H / C)	Retainage (This column's Total's cell formula calculates the applicable variable rate)
			Work Previously Completed (Previous pay app SOV's column F. D is \$0 if this SOV is for first pay app.)	Work Completed This Period (Period as noted above)					
1.					\$ -		\$ -		<b>Retainage Variable Rate:</b>  If Total Work Completed to Date & Materials Presently Stored (H) is less than or equal to 50% of Total Scheduled Value (C), Retainage = $H \times 0.05$ .  Once H exceeds 50% of C and up until project is complete, Retainage = $C \times 0.025$ .  There will be no retainage on final
2.					\$ -		\$ -		
3.					\$ -		\$ -		
4.					\$ -		\$ -		
5.					\$ -		\$ -		
6.					\$ -		\$ -		
7.					\$ -		\$ -		
8.					\$ -		\$ -		
9.					\$ -		\$ -		
10.					\$ -		\$ -		
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19.					\$ -		\$ -		
20.					\$ -		\$ -		
21.					\$ -		\$ -		
22.					\$ -		\$ -		

									payment application.
					\$ -		\$ -		
23.									
24.					\$ -		\$ -		
25.					\$ -		\$ -		

[illegible]



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app Form C-10 per the following indicated Form C-10 line #s:	C.	None	None	1.	2.	3.	3.	4.
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Note: If this SOV's column G: Materials Presently Stored includes any amounts other than \$0, then DCM Form C-10SM: Inventory of Stored Materials with back-up receipts must be submitted as part of the payment application documentation.



DCM Form C-10SM  
Revised October 2021

Project:	DCM (BC) No.:
	PSCA No, if any:
Contractor Company:	For Estimate No.:
	For Period Ending:

A	B	C	D	E
Description	Materials Stored Last Period	Materials Purchased This Period <i>(period noted above)</i>	Materials Used This Period <i>(period noted above)</i>	Materials Presently Stored <i>(B + C - D)</i>
TOTALS:				

**Instructions:**

- This Form C-10SM must be submitted as part of the payment application documentation when a Materials Presently Stored amount of anything greater than \$0 is noted on line 2 of DCM Form C-10: Application and Certificate for Payment.
- Receipts must be provided as attachments to this form C-10SM for all amounts placed in Column C: Materials Purchased This Period.
- The total \$ amount of this Form C-10SM's column E: Materials Presently Stored must match both Form C-10's line 2: Materials Presently Stored, and Form C-10SOV: Schedule of Values' total \$ amount of Column G: Materials Presently Stored.
- The \$ amounts in this current Form C-10SM's Column D: Materials Used This Period are amounts that must all be included in the current payment application's Form C-10SOV's Column E: Work Completed This Period.
- The \$ amounts in this current Form C-10SM's Column E: Materials Presently Stored are the amounts that must be listed in the next payment application's Form C-10SM's Column B: Materials Stored Last Period.

# PRE-CONSTRUCTION CONFERENCE CHECKLIST

The following are recommended topics to be covered during the required Pre-Construction Conference. Contact the DCM Project Inspector at least fourteen (14) days prior to scheduling the conference.

*\*Item shall be discussed while Owner is present.*

	*1. Name and relationship to job of local Owner personnel
	2. Public officials involved
	3. Names of architect/engineer personnel involved
	4. Provide e-mail addresses on Pre-Construction Sign-in sheet
	5. Construction sets of plans available to contractor
	6. Verify alternates accepted, etc.
	7. Approved list of sub-contractors
	8. Approved cost breakdown & Progress Schedule
	9. Method of approving monthly payment requests
	10. Change Orders - Documentation - no prior work, <b>unless authorized in writing</b>
	11. Shop drawings, time to process
	<p>12. Advance notice for required inspections</p> <p>The contractor will notify the architect by email of the date the project will be ready for an inspection by the Division of Construction Management. Inspections must be requested 14 days in advance. When the DCM Inspector confirms the inspection date and time, the architect will send an email confirming the inspection date and time to all parties as well as a copy to <a href="mailto:inspections@realproperty.alabama.gov">inspections@realproperty.alabama.gov</a>. Cancellations of any scheduled inspection must be received in writing no later than 48 hours prior to the scheduled inspection. If the inspection is canceled, it will be rescheduled subject to the DCM Inspector's availability. Cancellations received less than 48 hours in advance shall incur a \$1,500.00 re-inspection fee. If the contractor is not ready for the scheduled inspection he shall incur a \$1,500.00 re-inspection fee.</p>
	<p>13. Inspection Minimum Requirements</p> <p>The following minimum requirements listed below are provided to aid the contractors and architect in determining if a project is ready for a required inspection.</p> <p><u>Pre-Construction Conference:</u> Required Attendees: Contractor, Owner, Architect, Major Subs</p> <ul style="list-style-type: none"> <li>Fully-executed construction contract and Notice to Proceed</li> <li>Verification of permit fee payment (Exception: fully locally-funded K-12 &amp; public four-year University capital improvement, HVAC, or roof projects with <b>both</b> an estimated cost of \$750,000.00 or Less, <b>and a contract awarded on or after 10/01/22</b>, are exempt from DCM Fees.)</li> <li>Contractor's statement of responsibility and quality assurance plan (storm shelter)</li> <li>Fire alarm contractor and fire sprinkler contractor certification (from State Fire Marshal)</li> <li>ADEM permit, if more than one acre of land is disturbed</li> </ul> <p><u>Pre-Construction Conference for Storm Shelter:</u> Required Attendees: Contractor, Owner, Architect, Structural Engineer, Major Subs, Special Inspections Representative</p> <ul style="list-style-type: none"> <li>The completed and signed DCM Form C-17: Contractor's Statement of Responsibility for Construction of Tornado Storm Shelter (Hurricane Shelter Where Applicable) along with the required Quality Assurance Plan (QAP) must be submitted to the DCM Inspector at the pre-construction conference.</li> </ul>

	<p>13. <u>Pre-Roofing Conference</u>: Required Attendees: Contractor, Owner, Architect, Roofing Sub, Roofing Manufacturer's Representative</p> <ul style="list-style-type: none"> <li>• Roofing submittals must be approved by the architect prior to pre-roofing conference</li> <li>• Roofing manufacturer must provide documentation that roof design and roofing materials meet code requirements for wind uplift and impact resistance</li> <li>• Copy of sample roof warranty – Note: Standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.</li> </ul> <p><u>Above Ceiling Inspections</u>: Required Attendees: Contractor, Owner, Architect, MEP Engineers, Major Subs</p> <ul style="list-style-type: none"> <li>• All work must be completed except for installation of ceiling tiles, and/or hard ceilings</li> <li>• Space must be conditioned</li> <li>• Permanent power must be connected unless otherwise arranged with the DCM Inspector</li> <li>• Grease duct must be inspected and approved by the DCM Inspector prior to fire wrapping and above-ceiling inspection</li> </ul> <p><u>Life Safety Inspections and Final Inspection</u>: Required Attendees: Contractor, Owner, Architect, Engineers, Major Subs, Local Fire Marshal</p> <ul style="list-style-type: none"> <li>• Fire alarm certification</li> <li>• Kitchen hood fire suppression system certification</li> <li>• General contractor's 5-year roofing guarantee (DCM Form C-9)</li> <li>• Roofing manufacturer's warranty</li> <li>• Above ground and below ground sprinkler certifications</li> <li>• Completed certificate of structural engineer's observations (for storm shelter)</li> <li>• Emergency and exit lighting tests</li> <li>• Fire alarm must be monitored</li> <li>• Elevator inspection completed and certificate of operation provided by the State of Alabama Department of Labor</li> <li>• Boiler/vessels inspection completed and certificate of operation provided by the State of Alabama Department of Labor</li> <li>• Pressure test/Flush test for underground sprinkler lines (witnessed by local fire marshal, fire chief and/or DCM Inspector)</li> <li>• Flush/pressure test for new and/or existing fire hydrants</li> <li>• Must have clear egress/access and emergency (for first responders) access to building</li> <li>• Must have ADA access completed</li> </ul> <p><u>Year-End Inspection</u>: Required Attendees: Contractor, Owner, Architect, Engineers and/or Major Subs may be required</p> <ul style="list-style-type: none"> <li>• Owner's list of documented warranty items</li> <li>• Reconciliation of user fees with DCM shall be completed prior to inspection</li> </ul>
	14. Other inspections required before work is covered
	15. Inspection report distribution – weekly per Owner-Architect Agreement
	16. Record Drawings, definition of, procedures, addenda posted, etc.
	*17. Project sign and other job signs
	18. Point of contact for project. Job Superintendent and phone number.
	*19. Overall phasing of job
	20. Contractor's duty to coordinate work of separate contractors
	*21. Use of site and existing building, access drive, signs
	*22. Use of existing toilets
	*23. Coordinate any utilities supplied by Owner
	*24. Coordinate outages and work in existing building with Owner
	25. Keeping existing exit paths open

	26. Routine job cleanup
	27. O.S.H.A. - Report all accidents - safety General Contractor's responsibility
	28. Contractor is reminded of obligation to comply with the Alabama Child Labor Law and E-verify
	29. Project limits
	30. Building location relative to critical property line, easement, setback, etc.
	31. Locating property line, corners, etc.
	32. Verify sanitary outfall before committing floor level
	33. ADEM land disturbance permits shall be required if site is over 1-acre.
	34. Procedure if bad soil or rock is encountered: Geotech and special inspections
	35. Stockpiling topsoil
	36. Protecting trees
	37. Soil compaction, type soil, lab tests, etc.
	38. Soil Treatment, mix on site in presence of Job Superintendent
	39. Surveyor to check foundation wall if location critical
	40. Ready mix plant, file delivery tickets, slump tests, cylinders
	41. Quality of concrete work; concrete testing
	42. Inspections before pouring concrete
	43. What is expected of masonry work, mortar additive
	44. Problems with hollow metal - install proper fire labels
	45. Pre-roofing Conference - no roofing materials installed prior to conference, all roofing submittals and warranties must have been reviewed and approved by the Architect prior to the Pre-roofing Conference. Manufacturer's Representative must be present at Pre-roofing conference. The Roofing Manufacturer must show compliance with the IBC wind and impact-resistance requirements. Contractor shall video existing building interior and exterior prior to roofing operations and provide copy to Owner.
	46. General Contractor's Roofing Guarantee and Manufacturer's Roofing Warranties must be presented to DCM Inspector at Final Inspection and submitted with Certificate of Substantial Completion
	47. Potential conflict of mechanical and electrical equipment; shop drawings
	48. Return air plenums (no combustibles)
	49. Fire damper installation issues
	50. Certificate of Substantial Completion/Final Inspection
	51. Conduct of contractor's personnel. No interaction with staff and/or students. No foul language, no smoking or use of tobacco products, no drugs and no firearms on school property.
	52. Elevators/Pressure Vessels must be inspected and approved by the State of AL Dept. of Labor prior to final inspection.
	53. Life safety, fire alarm, sprinkler and kitchen hood fire suppression systems must be complete and certified prior to final Inspection. Also, exit and emergency lighting must be complete.
	54. Comply with ADA requirements: plumbing fixture heights, toilet partition widths, turnaround, signage, parking lot striping, etc.

	55. Coordinate with local fire authority to assure access to the building for firefighting equipment during construction and before final acceptance. Provide fire extinguishers as required.
	56. Light gauge metal roof framing and/or wood truss framing to be inspected by the structural engineer.
	57. Comply with fire hydrant requirement; coordinate with local Fire Authority or State Fire Marshal.
	58. Craft-faced insulation is not to be installed exposed.
	59. Fire alarm contractor and fire sprinkler contractor must be permitted through the State of Alabama Fire Marshal's Office. Provide permits.
	60. All sprinkler system valves must be electrically supervised
	*61. Fire alarm monitoring requirements
	62. Storm Shelter requirements <ul style="list-style-type: none"> <li>a. Contractor's Statement of Responsibility and Quality Assurance Plan – Provide paperwork at Pre-Construction Conference</li> <li>b. Certification of Structural Observations from the Structural Engineer of Record must be attached to the Certificate of Substantial Completion form.</li> </ul>
	63. Third-party inspections/special inspections
	64. Release of retainage – 30 days to complete punch list and closeout
	*65. Sales tax savings (Alabama Department of Revenue)
	66. Project Closeout - precedes Final Payment <ul style="list-style-type: none"> <li>a. Warranties</li> <li>b. Operating and Maintenance Manuals</li> <li>c. As-built Drawings</li> <li>d. Other requirements</li> </ul>
	67. Advertisement of Completion - start ad after substantial completion <ul style="list-style-type: none"> <li>a. for projects less than \$50,000.00, Owner advertises 1 week</li> <li>b. for projects \$50,000.00 or more, Contractor advertises for 4 consecutive weeks</li> </ul>
	68. Time Extensions
	69. Final Payment Application checklist

SAMPLE PROGRESS SCHEDULE & REPORT				CONTRACTOR (Contractor may use own form in lieu of Form C-11):								DATE OF REPORT:							
DCM (BC) No.:												ARCHITECT/ENGINEER:				PROCEED DATE:			
PSCA projects: PSCA No.:																PROJECTED COMPLETION DATE:			
PROJECT:																			
WORK DIVISION	%	AMOUNT																	
1. GENERAL REQUIREMENTS																			
2. SITEWORK																			
3. CONCRETE																			
4. MASONRY																			
5. METALS																			
6. WOOD AND PLASTIC															100%				
7. THERMAL AND MOISTURE PROTECTION															90%				
8. DOORS AND WINDOWS															80%				
9. FINISHES															70%				
10. SPECIALTIES															60%				
11. EQUIPMENT															50%				
12. FURNISHINGS															40%				
13. SPECIAL CONSTRUCTION															30%				
14. CONVEYING SYSTEMS															20%				
15. MECHANICAL															10%				
16. ELECTRICAL															0%				
TOTAL ORIG. CONTRACT	100%																		
ANTICIPATED DRAW IN \$1,000																			
ACTUAL DRAW IN \$1,000																			
<div> <div>LEGEND:</div> <div> <div>—</div> <div>— — —</div> <div>— — — —</div> <div>— — — — —</div> </div> <div> <div>ANTICIPATED ACTIVITY</div> <div>ACTUAL ACTIVITY</div> <div>ANTICIPATED CASH FLOW</div> <div>ACTUAL CASH FLOW</div> </div> </div> <div>USE ADDITIONAL SHEETS IF JOB IS SCHEDULED OVER 12 MONTHS.</div>																			

DCM Form C-11  
August 2021

**TO: Alabama Department of Finance**  
**Real Property Management**  
**Division of Construction Management**  
770 Washington Avenue, Suite 444  
Montgomery, AL 36104  
(334) 242-4082, inspections@realproperty.alabama.gov

DCM Form B-9  
August 2021

## PROJECT DATA FORM

Date: \_\_\_\_\_

DCM (BC) No. \_\_\_\_\_

*This form does not need to be submitted to DCM. It is for your office use and the Contractor's office use, if needed.*

PROJECT (NAME AND LOCATION)	OWNER (FULL ENTITY NAME, ADDRESS, & PHONE No.)
CONTRACTOR (FULL CO. NAME, ADDRESS, & PHONE No.)	ARCHITECT/ENGINEER (FIRM NAME, ADDRESS, & PHONE No.)

<b>FUNDING SOURCE:</b>				
<b>PSCA</b>	<b>LOCAL</b>	<b>STATE</b>	<b>OTHER</b>	_____

<b>CONTRACT AMOUNT: \$</b>
<b>Alternates Included in Contract:</b>

<b>CONTRACT TIME</b>	Date Bids Rec'd:	Date of Contract:
Work Start Date:	Time Limit:	Scheduled Completion Date:

<b>BONDS and INSURANCE</b>
Performance Bond By:
Payment Bond By:
Builder's Risk By:
Workman's Compensation By:
Liability By:

### **\*\*PRECONSTRUCTION CONFERENCE NOTE\*\***

**Please contact the appropriate DCM Inspector for this project by telephone or email at least fourteen (14) days prior to scheduling the Pre-Construction Conference. Inspector territories and email addresses are on the Staff webpage of [www.dcm.alabama.gov](http://www.dcm.alabama.gov).**

	Len Kirk - (334) 850-2067		Chandler Gann - (334) 320-1844
	Paul Gray - (256) 248-5202		David Roberson - (256) 299-0517
	Corey Odom - (334) 320-1721		Steve Pendley - (251) 331-2319
	Don Williams - (256) 248-5147		

## Date: \_\_\_\_\_

<b>DCM (BC) #</b>	<b>PSCA #</b>
PROJECT NAME AND LOCATION:	OWNER ENTITY NAME & ADDRESS:       <b>Phone No.</b>
CONTRACTOR COMPANY NAME & ADDRESS:       <b>Phone No.</b>	ARCHITECTURAL/ENGINEERING FIRM NAME & ADDRESS:       <b>Phone No.</b>
<b>PROJECT DATA ON THE DATE OF OBSERVATION:</b>	
No. of Workers _____ Site Conditions _____ Weather _____ Starting Date _____ Contract Completion Date _____ Scheduled State of Completion _____% Estimated Actual Completion _____% Contractor's Superintendent _____ Job Phone # _____	
<b>COMMENTS / DEFICIENCIES:</b>	
<b>Signature</b> _____ <b>Report No.</b> _____	
<b>cc: Owner, Architect/Engineer, Contractor, DCM Office</b> (inspections@realproperty.alabama.gov), <b>DCM Inspector</b>	



**Alabama Department of Finance  
Real Property Management  
Division of Construction Management**

770 Washington Avenue, Suite 444  
Montgomery, Alabama 36104  
(334) 242-4082 FAX (334) 242-4182

DCM Form B-12  
August 2021

# CHANGE ORDER CHECKLIST

*For use with DCM Form C-12 and DCM Form 9-J*

## WHICH FORM DO YOU USE?

Use **DCM Form C-12** for contracts of state agencies and departments, SDE, and ACCS projects.  
Use **DCM Form 9-J** for contracts of projects partially or fully Public School and College Authority (PSCA)-funded.  
Include a completed **DCM Form B-11: Change Order Justification** with either DCM Forms C-12 or 9-J.

Verify that the following information is inserted in the spaces provided on the CONTRACT CHANGE ORDER form, or attached to the form where attachments are noted to be acceptable or obviously necessary. Do not staple forms; use clips.

1.	<b>CHANGE ORDER NUMBER:</b> Insert current change order number.
2.	<b>DATE:</b> Insert date.
3.	<b>DCM (BC) PROJECT NUMBER:</b> Insert DCM Project Number in the block provided at top of document.
4.	<b>CONTRACTOR</b> Insert name and address of the Contractor, exactly as they appear on the Construction Contract.
5.	<b>NAME OF PROJECT:</b> Under "Project", insert the complete name of the project as identified in the bid documents. If using DCM Form 9-J, insert the PSCA Project Number in the space provided.
6.	<b>CONTRACTOR'S PROPOSALS:</b> Under "TERMS", identify the change order proposals submitted by the contractor that are being addressed by the Contract Change Order. Identify these proposals by inserting their dates.
7.	<b>DESCRIPTION OF THE CHANGE(S) IN WORK:</b> Fully describe the change or changes to the original contract work for which the Construction Contract is being modified. This description should be written so that a reader of the document who is not directly involved in the project can understand what is being changed. If the space provided on the form is inadequate for such a description, use attachments and cite them.
8.	<b>CONTRACT AND CHANGE ORDER AMOUNTS:</b> Insert the applicable dollar amounts to record the original contract sum, change orders, and the currently revised contract sum.
9.	<b>EXTENSION OF TIME:</b> If the Contract Time is being extended by the Contract Change Order, insert appropriate number of <b>calendar days</b> in the space provided. If the Contract Time is not being extended, insert "NONE".
10.	<b>RESPONSIBILITY FOR CHANGE ORDER FUNDING - DCM Form 9-J ONLY:</b> The authority responsible for funding the change order is to be identified in the following sentence in the form,: "The amount of this Change Order will be the responsibility of _____." Insert whichever is appropriate: (1) "PSCA", (2) name of LEA, or (3) "PSCA" and name of LEA.
11.	<b>SIGNATURES:</b> The signature spaces for State Agency, PSCA and fully locally-funded Alabama Community College System projects are different from each other. Download the appropriate document per Owner/project type from <a href="http://www.dcm.alabama.gov/forms.aspx">www.dcm.alabama.gov/forms.aspx</a> . Before submitting a Contract Change Order to DCM, the document must be signed by the contractor, surety (for additive change orders only), design professional and owner (local owner or using agency). Signature by the surety is not necessary on deductive change orders or change orders involving only extensions of time. If the cumulative change order amount exceeds 10% of the original contract amount then the Owner's legal consultant must sign DCM Form B-11: Change Order Justification.
12.	<b>ATTACHMENTS:</b> To each copy of the Contract Change Order form, attach with clips (do not staple): a. Contractor's change order proposals and/or invoices providing a detailed breakdown of change order costs. General Contractors (GC) must include subcontractors' (sub) quotes as backup. All GC and sub quotes must be broken down by labor (hours and rates), materials including quantities and unit prices (with receipts or quotes attached), equipment whether rented or owned (with receipts or quotes attached), and Overhead & Profit (OH&P). 1. Total OH&P can be a maximum of 25% divided between GC and subs; GC can have a maximum of 15% OH&P (in which case a sub could have up to 10% OH&P). See General Conditions- Article #19. 2. Sales tax cannot be included in change orders. 3. Deductive change orders also require backup including breakdown of labor and material, and must also deduct OH&P if included in original bid. Include specification section regarding allowances. b. <b>POWER OF ATTORNEY</b> for the individual signing the Contract Change Order for the surety. c. <b>DCM Form B-11, CHANGE ORDER JUSTIFICATION:</b> completed and signed by the design professional and owner.

## CONTRACT CHANGE ORDER

Change Order No. \_\_\_\_\_ Date \_\_\_\_\_ DCM (BC) No. \_\_\_\_\_

<b>TO: (Contractor)</b> Co. Name: Address:	<b>PROJECT:</b>
--	-----------------

TERMS: You are hereby authorized, subject to the provisions of your Contract for this project, to make the following changes thereto in accordance with your proposal(s) dated \_\_\_\_\_.

FURNISH the necessary labor, materials, and equipment to *(Description of work to be done or changes to be made. If the description is continued in an attachment, identify the attachment below.):*

Description continued from Page 1:

<b>ORIGINAL CONTRACT SUM</b>		\$ _____
<b>NET TOTAL OF PREVIOUS CHANGE ORDERS</b>		\$ _____
<b>PREVIOUS REVISED CONTRACT SUM</b>		\$ _____
<b>THIS CHANGE ORDER WILL</b>	<b>INCREASE      DECREASE</b>	
	<b>THE CONTRACT SUM BY</b>	\$ _____
<b>REVISED CONTRACT SUM, INCLUDING THIS CHANGE ORDER</b>		\$ _____

**EXTENSION OF TIME** resulting from this Change Order      None      or      \_\_\_\_\_ Calendar days.

The Owner does hereby certify that this Change Order was executed in accordance with the provisions of Title 39, Code of Alabama, 1975, as amended.

<p>_____</p> <p>Architectural/Engineering Firm</p> <p>Recommended By _____</p> <p>Name &amp; Title _____</p>
--

**APPROVAL**

<p><b>ALABAMA STATE DEPARTMENT OF EDUCATION</b></p> <p><b>(SDE)</b></p> <p><i>(Required for locally-funded, SDE projects.)</i></p> <p>By _____ Date: _____</p> <p>State Superintendent of Education</p>
---

**CONTRACTING PARTIES**

<p>_____</p> <p>Contractor Company</p> <p>By _____</p> <p>Name &amp; Title _____</p>
--

<p>_____</p> <p>Awarding Authority/Owner Entity</p> <p>By _____</p> <p>Name &amp; Title _____</p>
---

<p><b>CONSENT OF SURETY</b> (for additive \$ change orders only)</p> <p>_____</p> <p>Surety Company</p> <p>By _____</p> <p>(Attach current Power of Attorney)</p> <p>Name &amp; Title _____</p>
---

Review/Signature flow: Architect/Engineer (prepare documents) > Contractor (review and sign) (> Surety for additive \$ change orders only [sign]) > Architect/Engineer (review and sign) > Owner (review and sign) > SDE (review, sign, distribute the fully executed Change Order to all parties and forward a copy to the Alabama Division of Construction Management [DCM]). Note: DCM does not sign fully locally-funded SDE project contract documents.

TO: **Alabama Department of Finance**  
**Real Property Management**  
**Division of Construction Management**  
 770 Washington Avenue, Suite 444  
 Montgomery, Alabama 36104  
 (334) 242-4082 FAX (334) 242-4182

# CHANGE ORDER JUSTIFICATION

Change Order No. \_\_\_\_\_

Date: \_\_\_\_\_

DCM (BC) No. \_\_\_\_\_

*Purpose and instructions on next page.*

*Do not staple this form and/or attachments; use clips.*

<b>(A)</b>	PROJECT NAME & LOCATION:	OWNER ENTITY NAME & ADDRESS:						
	CONTRACTOR COMPANY NAME & ADDRESS:	ARCHITECTURAL / ENGINEERING FIRM NAME & ADDRESS:						
<b>(B)</b>	DESCRIPTION OF PROPOSED CHANGE(S): <b>ATTACH CONTRACTOR'S DETAILED COST PROPOSAL(s)</b>							
	AMOUNT: <input type="checkbox"/> ADD <input type="checkbox"/> DEDUCT \$ _____ TIME EXTENSION: _____ CALENDAR DAYS							
<b>(C)</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">ORIGINAL CONTRACT AMOUNT</td> <td style="width: 33%;">PREVIOUS C.O.'s _____ THRU _____</td> <td style="width: 34%; text-align: right;">CONTRACT AMOUNT PRIOR TO PROPOSED CHANGE ORDER</td> </tr> <tr> <td>\$ _____</td> <td>+ \$ _____</td> <td style="text-align: right;">= \$ _____</td> </tr> </table>		ORIGINAL CONTRACT AMOUNT	PREVIOUS C.O.'s _____ THRU _____	CONTRACT AMOUNT PRIOR TO PROPOSED CHANGE ORDER	\$ _____	+ \$ _____	= \$ _____
ORIGINAL CONTRACT AMOUNT	PREVIOUS C.O.'s _____ THRU _____	CONTRACT AMOUNT PRIOR TO PROPOSED CHANGE ORDER						
\$ _____	+ \$ _____	= \$ _____						
<b>(D)</b>	JUSTIFICATION FOR NEED OF CHANGE(S):							
<b>(E)</b>	JUSTIFICATION OF CHANGE ORDER vs. COMPETITIVE BID:							
<b>(F)</b>	ARCHITECT / ENGINEER'S EVALUATION OF PROPOSED COST:							
<b>(G)</b>	<b>CHANGE ORDER RECOMMENDED</b>  _____ ARCHITECTURAL / ENGINEERING FIRM NAME  By: _____ ARCHITECT / ENGINEER'S SIGNATURE  By: _____ OWNER'S PROJECT REPRESENTATIVE'S SIGNATURE	<b>CHANGE ORDER JUSTIFIED AND APPROVED</b>  _____ LOCAL OWNER ENTITY NAME  By: _____ OWNER'S SIGNATURE  By: _____ OWNER'S LEGAL COUNSEL'S SIGNATURE						

## CHANGE ORDER JUSTIFICATION: PURPOSE and INSTRUCTIONS

### PURPOSE

The awarding of work through an existing contract may potentially conflict with, or violate, the "Competitive Bid Laws" of the State of Alabama. **The determination of legality of Change Orders rests with the Awarding Authority and its legal advisor.** In a June 15, 1979, Opinion, the Office of the Attorney General offered guidelines for making such determinations in conjunction with considering the facts and merits of each situation. The purpose of the CHANGE ORDER JUSTIFICATION is to provide a means through which the Awarding Authority considers these guidelines and the intent of the "Competitive Bid Laws" when authorizing Change Orders. Pursuant to these guidelines, the following types of changes meet the criteria for awarding work through Change Orders in lieu of through the Competitive Bid process:

- I. Minor Changes for a monetary value less than required for competitive bidding.
- II. Changes for matters relatively minor and incidental to the original contract necessitated by unforeseeable circumstances arising during the course of the work.
- III. Emergencies arising during the course of the work of the contract.
- IV. Bid alternates provided for in the original bidding where there is no difference in price of the change order from the original best bid on the alternate.
- V. Changes of relatively minor items not contemplated when the plans and specifications were prepared and the project was bid which are in the public interest and which do not exceed 10% of the contract price.

Under these guidelines the cumulative total of Change Orders, including any negotiations to bring the original contract price within the funds available, would become questionable if the total of such changes and negotiations exceed 10% of the original contract price. These guidelines are not intended to interfere with the Awarding Authority's good faith discretion to respond to specific situations in the public's best interest. If the cumulative change order amount exceeds 10% of the original contract amount then the Owner's legal consultant must sign the Change Order Justification prior to submission to the Division of Construction Management (DCM).

### INSTRUCTIONS

The CHANGE ORDER JUSTIFICATION is to be prepared by the design professional, who has evaluated the fairness and reasonableness of the proposed cost of the change(s) and recommends that the proposed Change Order be executed. The fully executed Form B-11: CHANGE ORDER JUSTIFICATION must accompany the proposed DCM Form C-12: Change Order. Instructions for completing the B-11 form are:

1. Insert the proposed Change Order Number, date of the Justification, and DCM (BC) Project Number in the spaces provided in the upper right-hand corner.
2. **Section (A):** Insert the complete name and address of the PROJECT, OWNER, CONTRACTOR, AND ARCHITECT/ENGINEER.
3. **Section (B):** Provide a complete description of the proposed changes in work, referring to and attaching revised specifications and/or drawings as appropriate. An attachment may be used if additional space is needed, but insert the proposed amount and time extension of the change(s) in the spaces provided. **Attached a copy of the contractor's detailed cost proposal.**
4. **Section (C):** Insert the Original Contract amount, the net increase or decrease of previous Change Orders, and the Current Contract amount (preceding the currently proposed Change Order).
5. **Section (D):** Explain why it is necessary, or in the public's interest, to make the proposed change(s) to the Work.
6. **Section (E):** Explain why award of the changed work to the existing contractor instead of awarding the work under the competitive bid process is justified.
7. **Section (F):** The design professional must state his evaluation of the reasonableness and fairness of the proposed costs based upon his review of the contractor's proposal.
8. **Section (G):** The design professional must recommend the Change Order to the Owner by signing the document; the Owner may require such recommendation from other individuals. The Owner must sign the document indicating that they believe change order action in lieu of the competitive bid process is justified for the proposed change(s). **Review of the matter and signing of the document by the Owner's legal counsel is highly recommended. If the cumulative change order amount exceeds 10% of the original contract amount then the Owner's legal consultant must sign the Change Order Justification prior to submission to DCM.**

# FINAL PAYMENT CHECKLIST (FPC)

To be completed by the Architect/Engineer and submitted to DCM for review; applicable only to state agencies, partially or fully PSCA-funded and other bond-funded projects (exception: Alabama Community College System (ACCS) PSCA-funded projects with Notice-To-Proceeds issued after July 31, 2021). Two copies of the FPC are required. Each copy of the FPC shall include all attachments including the Contractor's Application for Final Payment. **If all PSCA funds are expended prior to Final Payment, it is not a requirement to submit the Application & Certificate for Final Payment along with the supporting documentation to DCM.**

(For further guidance refer to Article 34/Final Payment of DCM Form C-8: General Conditions of the Contract.)

<b>PROJECT:</b>		<b>DCM (BC) No.</b> _____  <b>PSCA No.</b> _____ <div style="text-align: right; font-size: small;">(If applicable)</div>
YES	N/A	<b>Select "YES" or "N/A" as applicable.</b>
		Application and Certificate for Final Payment, DCM Form C-10: Attach one copy to FPC. The application must include original signatures of all parties and include all application attachments.
		Certificate of Substantial Completion, DCM Form C-13: Attach one fully-executed copy to FPC.
		Advertisement for Completion, DCM Form C-14: Attach one copy of the affidavit of publication (including the advertisement) to the FPC.
		Contractor's Affidavit of Payment of Debts & Claims, DCM Form C-18: Attach one copy to FPC.
		Contractor's Affidavit of Release of Liens, if required by Owner, DCM Form C-19: Attach one copy to the FPC.
		Consent of Surety to Final Payment, if any, To Contractor, DCM Form C-20: Consent is required for projects with P&P Bonds. Original has been delivered to Owner. Attach one copy to FPC.
		General Contractor's Roofing Guarantee, DCM Form C-9, and Other Specified Roofing Guarantees, if any: Attached to Certificate of Substantial Completion.
		Contractor's One-Year Warranty: Original has been delivered to the Owner. Attach one copy to the FPC.
		Other Warranties: All other specified original warranties has been delivered to the Owner. Attach one copy to the FPC.
		Record Documents: Specified "As-built" plans and specifications have been delivered to the Owner.
		O & M Manuals: Specified instructions and O&M Manuals have been delivered to the Owner.
		Time Extension: Over-run of Contract Time has been reconciled by: <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span>Change Order</span> <span>Liquidated Damages</span> <span>Attached explanation</span> </div>
		Additional Documents or Explanations which are attached:          
<b>Submitted By:</b> _____ <div style="text-align: center; margin-top: 5px;">Architectural / Engineering Firm</div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 30%; text-align: center;">             _____              Signature           </div> <div style="width: 30%; text-align: center;">             _____              Printed Name and Title           </div> <div style="width: 30%; text-align: center;">             _____              Date           </div> </div>		

**Final Reconciliation of Fees:** Between the final change order execution and the year-end inspection, report the final project cost to <https://appengine.egov.com/apps/al/dcm-fees> (back-up is not needed unless requested by DCM). DCM will then email a Final Reconciliation of Fees Statement to the Owner. If the Final Statement shows a net payment is owed to DCM, that amount must be paid prior to scheduling the year-end inspection. If the Final Statement shows a net refund is owed then a check will be mailed to the Owner.

(Note: Use DCM Form C-13A for fully locally-funded K-12 & Public 4-Year University Capital Improvement, HVAC, & Roof Projects with **both** a total cost of \$750,000 or Less **and a contract awarded on or after 10/01/22**)

# CERTIFICATE OF SUBSTANTIAL COMPLETION

*Do not staple this form and/or attachments; use clips.  
Print single-sided; do not submit double-side printed documents.*

**ROUTING PROCEDURES** ON NEXT PAGE

DCM (BC) No. \_\_\_\_\_

<b>OWNER ENTITY NAME AND ADDRESS:</b>	<b>ARCHITECTURAL / ENGINEERING FIRM NAME AND ADDRESS:</b>
Email to receive executed copy: _____	Email to receive executed copy: _____
<b>CONTRACTOR COMPANY NAME AND ADDRESS:</b>	<b>BONDING COMPANY NAME AND ADDRESS:</b>
Email to receive executed copy: _____	Email to receive executed copy: _____
<b>PROJECT:</b>	

**Substantial Completion** has been achieved for                      the entire Work                      the following portion of the Work:

The **Date of Substantial Completion** of the Work covered by this certificate is established to be \_\_\_\_\_.

"Substantial Completion" means the designated Work is sufficiently complete, in accordance with the Contract Documents, such that the Owner may occupy or utilize the Work for its intended use without disruption or interference by the Contractor in completing or correcting any remaining unfinished Work. The Date of Substantial Completion is the date upon which all warranties for the designated Work commence, unless otherwise agreed and recorded herein.

**Punch List:** A \_\_\_\_\_ page list of items to be completed or corrected prior to the Owner's approval of Final Payment is attached hereto, but does not alter the Contractor's responsibility to complete or correct all Work in full compliance with the Contract Documents. The Contractor shall complete or correct all items on the attached list, ready for re-inspection for Final Acceptance, within 30 days after the above Date of Substantial Completion, unless another date is stated here: \_\_\_\_\_. If completed or corrected within this period, warranties of these items commence on the Date of Substantial Completion, otherwise such warranties commence on the date of Final Acceptance of each item.

Only one (1) originally executed substantial completion form shall be routed for signature. DCM office will mail the fully-executed original to the Owner and email copies to all parties.

<b>RECOMMENDED BY</b> <i>(signature and email address required):</i>	
ARCHITECT/ENGINEER: _____	DATE: _____
<b>CONTRACTING PARTIES:</b>	
CONTRACTOR: _____	DATE: _____
OWNER: _____	DATE: _____
_____	DATE: _____
<b>APPROVALS:</b>	
DCM INSPECTOR: _____	DATE: _____
DCM CHIEF INSPECTOR: _____	DATE: _____
DCM DIRECTOR: _____	DATE: _____

# **CERTIFICATE OF SUBSTANTIAL COMPLETION ROUTING PROCEDURE**

**Only one (1) originally executed substantial completion form shall be routed for signature. DCM office will mail the fully-executed original to the owner and email copies to all parties.**

**ARCHITECT/ENGINEER:** Sign and date document, then mail it to Contractor. Provide Owner with DCM Inspector's name & field office address; territories and addresses are available at [www.dcm.alabama.gov/staff.aspx](http://www.dcm.alabama.gov/staff.aspx).

**CONTRACTOR:** Sign and date document, then mail it to Owner.

**OWNER:** Sign and date document, then mail it to DCM Inspector's field office address; DCM Inspector territories and addresses are available at [www.dcm.alabama.gov/staff.aspx](http://www.dcm.alabama.gov/staff.aspx).

**DCM INSPECTOR:** Sign and date document, then mail it to DCM Montgomery office.

**DCM OFFICE:** After review and signature/date by DCM Chief Inspector and DCM Director, DCM office will mail the fully-executed original document to Owner and will email copies to all parties.

## **NOTICE**

**THE EXECUTED "GENERAL CONTRACTOR'S ROOFING GUARANTEE" (DCM Form C-9) AND ANY OTHER ROOFING WARRANTY REQUIRED BY THE CONTRACT MUST ACCOMPANY THIS CERTIFICATE TO OBTAIN DCM APPROVAL.**

Also, any standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.



## SAMPLE FORM OF ADVERTISEMENT FOR COMPLETION

### LEGAL NOTICE

In accordance with Chapter 1, Title 39, Code of Alabama, 1975, as amended, notice is hereby given

that \_\_\_\_\_,  
(Contractor Company Name)  
Contractor, has completed the Contract for (Construction) (Renovation) (Alteration)  
(Equipment) (Improvement) of (Name of Project):

at \_\_\_\_\_  
(Insert location data in County or City)  
for the State of Alabama and the (County) (City) of \_\_\_\_\_,  
Owner(s), and have made request for final settlement of said Contract. All persons having  
any claim for labor, materials, or otherwise in connection with this project should immediately  
notify

\_\_\_\_\_  
\_\_\_\_\_  
(Architect / Engineer)

\_\_\_\_\_  
(Contractor)

\_\_\_\_\_  
(Business Address)

NOTE: This notice must be run once a week for four successive weeks for projects exceeding \$50,000.00. For projects of \$50,000.00 or less, run one time only. A copy of the publisher's affidavit of publication (including a copy of the advertisement) shall be submitted by the Contractor to the Design Professional for inclusion with DCM Form B-13: Final Payment Checklist for state agencies, PSCA-funded and other bond-funded projects.

DCM (BC) Number: \_\_\_\_\_

PSCA Projects: PSCA Number: \_\_\_\_\_

Date of the Construction Contract: \_\_\_\_\_

## Contractor's Affidavit of Payment of Debts and Claims

<b>To Owner</b> ( <i>Entity name and address</i> ):	<b>Project</b> ( <i>Same as appears in the Construction Contract</i> ):

STATE OF:

COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Construction Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

Supporting Documents Attached Hereto:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. DCM Form C-20, Consent of Surety to Final Payment, may be used for this purpose.

Indicate attachment:            Yes            No

The following supporting document should be attached hereto if required by the Owner:

1. Contractor's Release of Waiver of Liens.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment supplies, to the extent required by the Owner, accompanied by the list thereof.
3. Contractor's Affidavit of Release of Liens, DCM Form C-19.

**Contractor** (*Insert company name and address*):

By: \_\_\_\_\_  
Signature of authorized representative

\_\_\_\_\_  
Name and Title

Sworn to and subscribed before me this \_\_\_\_\_ day  
of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public's Signature

My commission expires: \_\_\_\_\_

Seal:

DCM (BC) Number: \_\_\_\_\_

PSCA Projects: PSCA Number: \_\_\_\_\_

Date of the Construction Contract: \_\_\_\_\_

## Contractor's Affidavit of Release of Liens

<b>To Owner</b> ( <i>Entity name and address</i> ):	<b>Project</b> ( <i>Same as appears in the Construction Contract</i> ):

STATE OF:

COUNTY OF:

The undersigned hereby certifies that, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Construction Contract referenced above.

EXCEPTIONS:

Supporting Documents Attached Hereto:

1. Contractor's Release of Waiver of Liens.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment supplies, to the extent required by the Owner, accompanied by the list thereof.

**Contractor** (*Insert company name and address*):

By: \_\_\_\_\_  
Signature of authorized representative

\_\_\_\_\_  
Name and Title

Sworn to and subscribed before me this \_\_\_\_\_ day  
of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public's Signature

My commission expires: \_\_\_\_\_

Seal:

DCM (BC) Number: \_\_\_\_\_

PSCA Projects: PSCA Number: \_\_\_\_\_

Date of the Construction Contract: \_\_\_\_\_

Surety's Bond Number: \_\_\_\_\_

## CONSENT OF SURETY TO FINAL PAYMENT

<b>To Owner</b> ( <i>Entity name and address</i> ):     	<b>Project</b> ( <i>Same as appears in the Construction Contract</i> ):     
---	---

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the

**Surety** (*Insert name and address of Surety*)

on bond of

**Contractor** (*Insert name and address of Contractor*)

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to

**Owner** (*Insert name and address of Entity*):

as set forth in said Surety's bond.

**SIGNED AND SEALED** this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

**SURETY:**

Seal:

\_\_\_\_\_  
Company Name

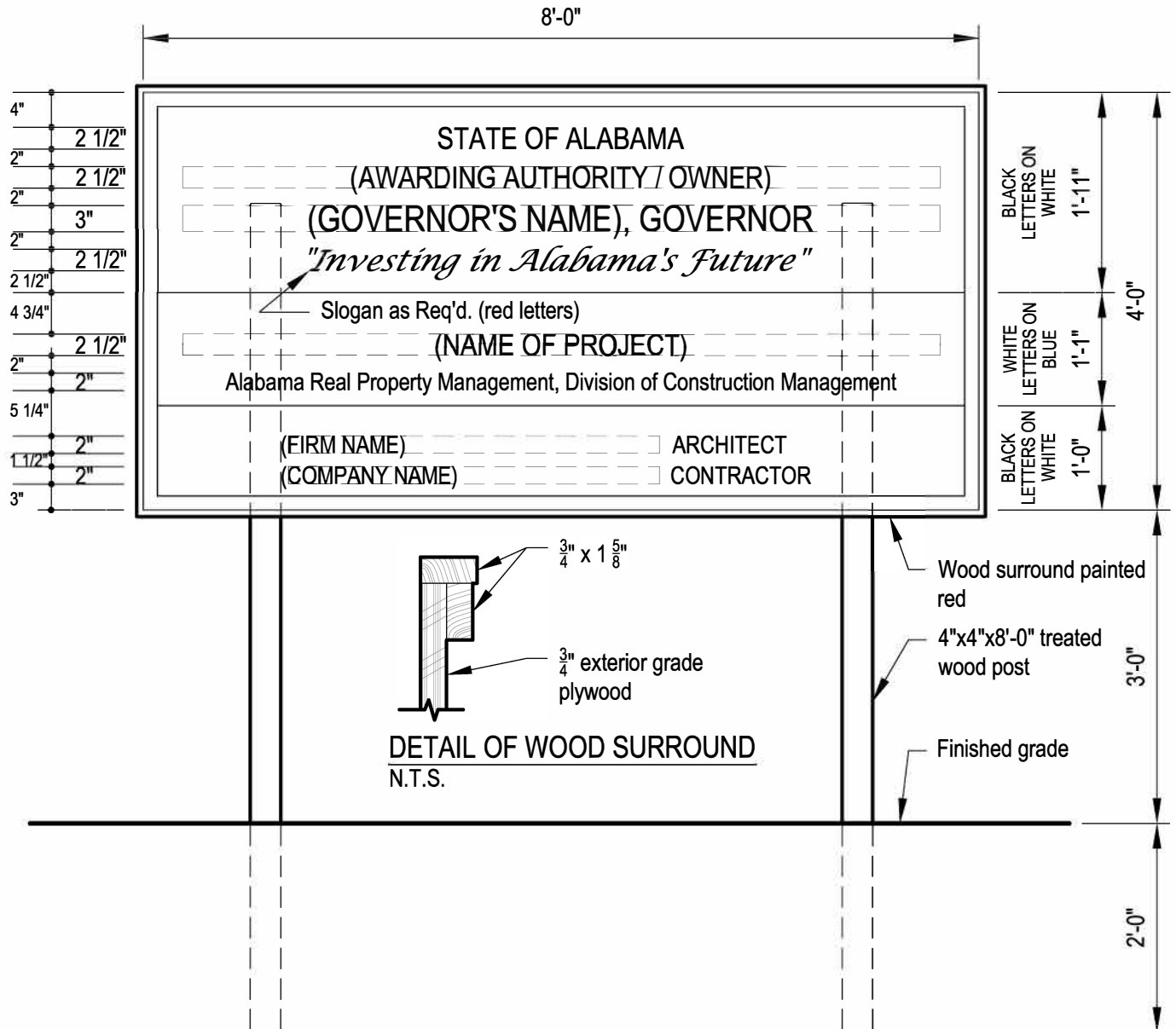
By \_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Printed Name and Title

Note: Original Power of Attorney for the Surety's signatory shall be furnished with each of the original forms to be attached to each of the four (4) final payment forms.

## DETAIL OF PROJECT SIGN

N.T.S.



### Notes:

1. Fully locally-funded State Agency and Public University projects: DCM Form C-15 must be included in the project manual regardless of expected bid amount. If the awarded contract sum is \$100,000.00 or more, Contractor shall furnish and erect a project sign.  
Fully locally-funded K-12 school projects: Project sign is not required unless requested by Owner, if project sign is requested by Owner, include DCM Form C-15 in the project manual.  
Partially or fully PSCA-funded projects: DCM Form C-15 must be included in the project manual. Contractor shall furnish and erect a project sign for all PSCA-funded projects, regardless of contract sum. "Alabama Public School and College Authority" as well as the local owner entity must be included as awarding authorities on the project sign of all PSCA-funded projects. Exception: Alabama Community College System (ACCS) PSCA-funded projects with Notice-To-Proceeds issued after July 31, 2021 are not submitted to DCM.  
Fully locally-funded ACCS projects with Notice-To-Proceeds issued prior to August 1, 2021: DCM Form C-15 must be included in the project manual regardless of expected bid amount. If the awarded contract sum is \$100,000.00 or more, Contractor shall furnish and erect a project sign.
2. Sign to be constructed of 3/4" exterior grade plywood.
3. Paint with two coats best grade exterior paint before letters are painted. Option: In lieu of painted lettering on plywood, a corrugated plastic sign (displaying the same lettering, layout and colors as above) may be secured directly to the unpainted exterior grade plywood.
4. Sign shall be placed in a prominent location and easily readable from existing street or roadway.
5. Sign shall be maintained in good condition until project completion.
6. Slogan: Act 2020-167's title *"Investing In Alabama's Future"* should be placed on the project signs of all PSCA-funded projects, otherwise the Awarding Authority/Owner's slogan, if any, should be used. If the Awarding Authority/Owner of a fully locally-funded project does not have a slogan, the project sign does not require a slogan.

*Do not staple this form and/or attachments; use clips.*

## GENERAL CONTRACTOR'S ROOFING GUARANTEE

DCM (BC) Project No. \_\_\_\_\_

Project Name & Address	Project Owner Entity(ies) Name(s) & Address(es)
------------------------	---

General Contractor's Company Name, Address, & Telephone Number	<b>EFFECTIVE DATES OF GUARANTEE</b>
	Date of Acceptance:
	Date of Expiration:

1. The General Contractor does hereby certify that the roofing work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved roofing manufacturers recommendations.
2. The General Contractor does hereby guarantee the roofing and associated work including but not limited to all flashing and counter flashing both composition and metal, roof decking and/or sheathing; all materials used as a roof substrate or insulation over which roof is applied; promenade decks or any other work on the surface of the roof; metal work; gravel stops and roof expansion joints to be absolutely watertight and free from all leaks, due to faulty or defective materials and workmanship for a period of five (5) years, starting on the date of substantial completion of the project. This guarantee does not include liability for damage to interior contents of building due to roof leaks, nor does it extend to any deficiency which was caused by the failure of work which the general contractor did not damage or did not accomplish or was not charged to accomplish.
3. Subject to the terms and conditions listed below, the General Contractor also guarantees that during the Guarantee Period he will, at his own cost and expense, make or cause to be made such repairs to, or replacements of said work, in accordance with the roofing manufacturers standards as are necessary to correct faulty and defective work and/or materials which may develop in the work including, but not limited to: blisters, delamination, exposed felts, ridges, wrinkles, splits, warped insulation and/or loose flashings, etc. in a manner pursuant to the total anticipated life of the roofing system and the best standards applicable to the particular roof type in value and in accordance with construction documents as are necessary to maintain said work in satisfactory condition, and further, to respond on or within three (3) calendar days upon proper notification or leaks or defects by the Owner or Architect.

- A. Specifically excluded from this Guarantee are damages to the work, other parts of the building and building contents caused by: (1) lightning, windstorm, hailstorm and other unusual phenomena of the elements; and (2) fire. When the work has been damaged by any of the foregoing causes, the Guarantee shall be null and void until such damage has been repaired by the General Contractor, and until the cost and expense thereof has been paid by the Owner or by the responsible party so designated.
- B. During the Guarantee Period, if the Owner allows alteration of the work by anyone other than the General Contractor, including cutting, patching and maintenance in connection with penetrations, and positioning of anything on the roof, this Guarantee shall become null and void upon the date of said alterations. If the owner engages the General Contractor to perform said alterations, the Guarantee shall not become null and void, unless the General Contractor, prior to proceeding with the said work, shall have notified the Owner in writing, showing reasonable cause for claim that said alterations would likely damage or deteriorate the work, thereby reasonably justifying a termination of this Guarantee.
- C. Future building additions will not void this guarantee, except for that portion of the future addition that might affect the work under this contract at the point of connection of the roof areas, and any damage caused by such addition. If this contract is for roofing of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing roof.
- D. During the Guarantee period, if the original use of the roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use of service more severe than originally specified, this Guarantee shall become null and void upon the date of said change.
- E. The Owner shall promptly notify the General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the General Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_ day  
of \_\_\_\_\_, \_\_\_\_\_.

---

General Contractor's Authorized Signature

---

Typed Name and Title

## CERTIFICATE OF ASBESTOS FREE BUILDING MATERIALS

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The undersigned hereby states that all building materials incorporated, installed, and used during the construction process for the below listed project by the Contractor or its Subcontractors of any tier are 100% asbestos free. **Asbestos Free means containing 0% asbestos in any form.** Refer to Section 01600, Product Requirements.

McKee Project Name: \_\_\_\_\_

McKee Project Number: \_\_\_\_\_

**CERTIFICATION:** The undersigned certifies that he or she is authorized to execute contracts and legal documents on behalf of the General Contractor as legally named, that this certification is submitted in good faith without fraud or collusion with any other person, that the information indicated in this document is true and complete, and that the document is made in full legal agreement.

To: \_\_\_\_\_  
(Owner / Awarding Authority of Construction Contract)

Date \_\_\_\_\_

Legal Name of General Contractor \_\_\_\_\_

General Contractor State License No. \_\_\_\_\_  
(Exactly as appears on license including designation letters)

General Contractor Mailing Address \_\_\_\_\_  
\_\_\_\_\_

By (Legal Signature) \_\_\_\_\_

Name & Title (print) \_\_\_\_\_

Telephone Number \_\_\_\_\_

E-Mail Address \_\_\_\_\_



## SECTION 01010 - SCOPE OF THE WORK

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS AND GENERAL INFORMATION

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 specification sections apply to the work of this section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Type of the Contract.
  - 2. Work Under This Contract.
  - 3. Completion Times.
  - 4. Division of Construction Management User Fees.
  - 5. Project Work Identification.
  - 6. Owner-furnished products.
  - 7. Supervision.
  - 8. Contractor Use of premises.
  - 9. Definitions.
  - 10. Work Under Other Contracts.
  - 11. Building and Site Construction.
  - 12. General Issues.
  - 13. Temporary Electrical Power and Jobsite Utilities.
  - 14. Site Security and Insurance Requirements.
  - 15. Protection of Work in Place.
  - 16. Work restrictions.
  - 17. Owner's occupancy requirements.
  - 18. Specification formats and conventions.
- B. Related Sections include the following:
  - 1. Division 1 Section 01500 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

#### 1.3 TYPE OF CONTRACT

- A. Construction Contract (DCM Form C-5, April 2020).

#### 1.4 WORK UNDER THIS CONTRACT

- A. Sealed Proposal shall be received as follows:
  - 1. One (1) Sealed Envelope MUST include the following:
    - a. General Contractor's Name and State General Contractor's License number MUST be legible on the front of the envelope.
    - b. One (1) Bid Proposal for all work as indicated on drawings and specifications.
    - c. Unit Price Attachment Sheet MUST be included if document is included in the project manual.
    - d. One (1) Contractor Completion Time Form for all work as indicated on drawings and specifications if document is included in the project manual.

- e. One (1) Bid Bond or certified check.
- f. One (1) Sales Tax Form.

#### **1.5 COMPLETION TIMES**

- A. The Contractor **MUST** state his/her completion time on their Bid Proposal Form. The Contractor's Completion Time will be taken into consideration for award of the construction contract.

#### **1.6 DIVISION OF CONSTRUCTION MANAGEMENT USER FEES**

- A. Refer to the Alabama Department of Finance, Construction Management Division Administrative Code, Chapter 355-16-1, "Collection Of User Fees" dated March 31, 2020.
  - 1. The Contractor shall include in his Base Bid Proposal all "Basic Permit Fee".
  - 2. **Do not** include the "Plan Review Fee" or the "Contract Administration Fee" in your Proposal.
  - 3. The Contractor shall be responsible for all "Re-Inspection Fees" per 355-16-1-.03 "Fees Required", (5) "Additional Fees", (b).

#### **1.7 PROJECT / WORK IDENTIFICATION**

- A. General: Project name is as indicated in the Advertisement For Bids and as shown on the Contract Documents prepared by McKee & Associates, 631 S. Hull Street Montgomery, Alabama 36104.
- B. Contract Documents: Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not limited to the following:
  - 1. Existing site conditions and restrictions on use of the site including ingress and egress to the site.
  - 2. Grading operations at the site.
  - 3. The Contractor shall be responsible to secure the site during the execution of the work and provide proof of insurance including but not limited to General Liability, W/C, Auto, Equipment, etc.
- C. Summary by References: Work of the Contract can be summarized by references to the Contract, General Conditions, Supplementary Conditions, the Project Manual, Technical Specification Sections, Drawings, Addenda and modifications to the Contract Documents issued subsequent to the initial printing of this Project Manual and the Drawings, and including but not necessarily limited to, printed material referenced by any of the above. It is recognized that the Work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions, and other forces outside the contract documents.

#### **1.8 OWNER FURNISHED PRODUCTS**

- A. Synthetic Athletic Flooring System as indicated on drawings.

#### **1.9 SUPERVISION**

- A. Supervision: The Contractor shall provide adequate supervision of the project to ensure proper supervision for all work.

#### **1.10 CONTRACTOR USE OF PREMISES**

- A. General: During the entire cleanup period the Contractor shall have the exclusive use of the premises for cleanup operations, including full use of the site as shown on the Drawings.
- B. Limitations of exclusive use of the site:
  - 1. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to applicable rules and regulations affecting the work while engaged in project performance. See site plan for ingress and egress to the site, or if not indicated, same shall be as designated by the Architect.
  - 2. Keep existing public roads, driveways and entrances serving the premises clear and available

- at all times. Do not use these areas for parking or storage of materials. Remove dirt, mud, debris, etc., from site, sidewalks, streets, and public right-of-way as it occurs.
3. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds and or designated storage areas as indicated.
  4. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.
  5. The Owner, and their representatives, the Architect and their Consultants, as well as authorities having jurisdiction will require site accessibility for inspections, observations, and perhaps other purposes, related to the planned new construction. All Contractors shall assist in such accessibility, to at least the point of providing and maintaining accessible dry paths to work in progress.
  6. Furnish and install by contractor temporary barricades, fencing, etc., as indicated or otherwise required, to restrict pedestrian and vehicular traffic from construction operations, including in part, Owner's staff, the public, students, children, and residents of the adjacent residential neighborhoods.
  7. Construction operations shall not affect in any manner, the on-going operations of the Owner, immediately adjacent facilities, adjacent property owners or businesses, or others. Refer to Division 1 Section "Special Conditions" for additional information and requirements regarding coordination with Owner's activities, etc.
  8. Construction equipment shall not come in contact with or swing over existing facilities to remain, public areas, occupied buildings, right-of-ways, etc., which are to remain.
  9. All contractors and their employees shall limit any discussion of the Work of this project to the Owner's representatives named in the front of this Project Manual, Consultants employed, inspecting authorities with jurisdiction, and the Architect. In no instance shall this project be discussed with others, except as may otherwise be indicated herein.
  10. Parking on-site, if any, shall be limited to the "staging areas" indicated on the Drawings, or if not indicated, as mutually agreed between the Architect and Contractor at the Pre-Construction Conference.
  11. Smoking or other use of tobacco products shall not be permitted within the structure of the Building, Owner's facilities or on roofs.
  12. The use or presence of alcohol and/or other debilitating substances shall not be permitted in the construction of the building and or on the project site.
  13. Firearms and/or other weapons shall not be permitted on the project site.
  14. The Contractor shall furnish necessary temporary toilets for all work forces on the job site.

## **PART 2 - SCOPE OF THE WORK**

### **2.1 DEFINITIONS**

- A. The Scope of the Work of the Contract is meant to be viewed as a successor to the General Special Conditions of the Contract. Should any discrepancy or ambiguity be noted, the Scope of the Work of the Contract shall apply and the General Special Conditions of the Contract shall defer to Scope of the Work of the Contract Documents. The scope of the work shall be taken in its entirety by all contractors. In signing the contract all contractors have read and understand that the Scope of the Work and the General Special Conditions are taken in their entirety.
  1. The term "Design Consultant" shall be construed to mean "Architect".
  2. **The terms "Owner" shall mean " Baldwin County Board of Education ".**

### **2.2 WORK UNDER OTHER CONTRACTS**

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Concurrent Work: Owner will award separate contract(s) for the following construction operations at the Project site. Those operations will be conducted simultaneously with work under this Contract.
  - 1. Work done by others or by Owner.
    - a. Any items noted N.I.C.
    - b. Construction Testing as defined in applicable sections of the project manual.

## **2.3 BUILDING AND SITE CONSTRUCTION**

- A. The Contractor shall maintain the entire site, provide dust control and keep the streets clean at all times and or as directed by the Architect. The Contractor shall call for and be responsible for the locating of all utilities prior to start of work. Use extreme care when working in close proximity to the existing water lines to prevent movement and damage to the water lines.
- B. The Contractor shall install and or replace all fencing including furnish and install all temporary fencing as required for all work including safety barriers, signs, traffic directional signals, temporary stripping, flagman, temporary road plates and any temporary roads around any obstruction and or work being constructed. The Contractor shall make all provisions to keep the public and or temporary access roads open during the duration of the work.
- C. The Contractor shall maintain & level, all temporary roads and temporary lay down and storage areas using same stone base material. Roads must have no potholes, dips, or rises and provide access to and from the site and other locations on site. The Contractor shall maintain the temporary roads used to move material on the site. Temporary roads are existing and the Contractor shall maintain these temporary roads throughout the duration of construction activity while Contractor is onsite.

## **2.4 GENERAL ISSUES**

- A. The Contractor shall be responsible for their own on-site safety requirements within the site per OSHA regulations.
- B. Only an approved company owned and insured vehicle shall be allowed on to the construction site. Vehicles shall be clearly marked and identified with the company logo and or name.

## **2.5 TEMPORARY ELECTRICAL POWER AND JOBSITE UTILITIES**

- A. The Contractor is responsible for the all costs associated with temporary electrical requirements for performance of the work. The Contractor shall be responsible for the all costs associated with temporary water required for the performance of the work. The Contractor is responsible for all other utility costs as required for the performance of the work.

## **2.6 SITE SECURITY / INSURANCE REQUIREMENTS**

- A. The Contractor shall have care custody and control of the site. Contractor shall be responsible for the replacement of their material, equipment and any loss of such. Contractor shall be responsible for securing all material and equipment. If there is a loss and or damage of material and equipment, that loss shall go against the Contractor's insurance coverage.

## **2.7 PROTECTION OF WORK IN PLACE**

- A. The Contractor shall protect all completed work and any rework shall be the responsibility of the contractor **at** no additional cost to the owner.

## **2.8 WORK RESTRICTIONS**

- A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect and Owner not less than two days in advance of the proposed utility interruptions.
  2. Do not proceed with utility interruptions without Architect's and Owner's written permission.
- B. Nonsmoking Building: Smoking and smokeless tobacco will not be permitted within the new construction after floor slabs are poured.

## **2.9 OWNER'S OCCUPANCY REQUIREMENTS**

- A. Owner Occupancy: Owner will occupy adjacent parking lots during entire construction period. Cooperate with Owner during construction operations adjacent to or near the existing building and parking to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.
- B. Maintain access to existing walkways and other adjacent occupied or used facilities. Do not close or obstruct walkways or other occupied or used facilities without written permission from Owner and authorities having jurisdiction. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- C. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to place and install equipment in completed areas of building, before Substantial Completion, provided such does not interfere with completion of the Work. Such placement of equipment shall not constitute acceptance of the total Work.

## **2.10 SPECIFICATION FORMATS AND CONVENTIONS**

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format numbering system.
1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications another Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

## **PART 3 - NOT APPLICABLE**

### **END OF SECTION**

## SECTION 01011 - CONTINGENCY ALLOWANCE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS AND GENERAL INFORMATION

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 specification sections apply to the work of this section.

### PART 2 - CONTINGENCY ALLOWANCES

#### 2.1 BASE BID PROPOSAL

- A. The General Contractor shall include the following sums:
  - 1. **One Hundred Thousand Dollars (\$100,000.00)** as a contingency to cover unforeseen conditions or minor changes that are necessary to correct or supplement the work as detailed in the Contract Documents.
  - 2. **Four Thousand Five Hundred Dollars (\$4,500.00)** as a contingency to cover the costs of Signal Testing to determine if an ERRC will be required.
  - 3. **One Hundred Fifty-Thousand Dollars (\$150,000.00)** as a contingency to provide a new ERRC System (should the signal coverage be inadequate).
  - 4. **Thirty Thousand Dollars (\$30,000.00)** as a contingency for Electrical Aid to Construction.
  - 5. **Twenty-five Thousand Dollars (\$25,000.00)** as a contingency to cover the costs of providing and installing Logos and Signage as directed by the Owner/Architect and detailed in the Contract Documents.
  - 6. **One Hundred Eighty Thousand Dollars (\$180,000.00)** as a contingency to cover the costs of providing and installing Weight Benches and Floor Mats as directed by the Owner/Architect and detailed in the Contract Documents.

- 2.2 The Contractor shall include in his bid proposal(s) all costs of office, job supervision, overhead, profit, and bond on these Contingency Allowances, because no such costs will be paid to Contractor for work performed under these Contingency Allowances. Only the direct costs of performing work under this provision shall be paid under and charged against the Contingency Allowance; such cost includes costs of materials and delivery, installation labor, payroll taxes and insurance, equipment expense, and the cost of subcontracted work (subcontractor's cost may include a maximum of 15% mark-up for overhead and profit).

### PART 3 – AUTHORIZATION OF CONTINGENCY ALLOWANCES

- 3.1 After unknown conditions are identified and examined and the scope of work and method of repair determined, or request for a proposal to cover additional work has been issued by the Owner, the Contractor shall submit a proposal for such work to the Architect for the Owner's approval. If the Owner approves of such proposal, he will issue written authorization to the Contractor to perform the work and charge the related costs to the Contingency Allowance. At the Owner's option, work performed under this provision may be ordered done on a time and material basis, in which case; the Contractor shall keep accurate records of all time and materials used and submit such records to the Architect for his approval at the end of each day's work.
- 3.2 An accounting of the costs charged against this Contingency Allowance shall be mutually maintained by the Contractor, Architect, and Owner throughout the course of the project. Any of this Contingency Allowance not spent shall be credited to the Owner by Change Order at close out of the project. Refer to Contingency Allowance Form attached to this Section.
- 3.3 Provide for payment.
  - A. The Contractor shall include a line item in the *Schedule of Values* entitled "Contingency Allowance". The estimated value of work completed pursuant to fully executed Contingency

Allowance Authorizations may be included in the Contractor's monthly Applications for Payment. Payments under this Contingency Allowance shall not exceed the net, total of fully executed Contingency Allowance Authorizations.

### **3.4 CONTINGENCY ALLOWANCE AUTHORIZATION FORM**

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

CONTINGENCY ALLOWANCE  
01011-2

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**Form to be filled in its entirety.**

To: McKee & Associates, Architects From: \_\_\_\_\_  
Project: \_\_\_\_\_ Company \_\_\_\_\_  
\_\_\_\_\_ Address \_\_\_\_\_  
\_\_\_\_\_ Contact and Email \_\_\_\_\_  
Project Number \_\_\_\_\_ Date: \_\_\_\_\_  
Building Commission Number: \_\_\_\_\_ Authorization Number: \_\_\_\_\_

---

In accordance with Specification Section 01011 – CONTINGENCY ALLOWANCE, the Contractor [ \_\_\_\_\_ ] is hereby authorized to proceed with the changes in Work as are described below and is to be paid for the performance of these changes as provided in Specification Section 01011. This Authorization shall become effective when it is signed by the Contractor and the Owner's representative and it is understood and agreed that the amount(s) stipulated below constitute full compensation for these changes in Work.

---

TOTAL AMOUNT OF THIS AUTHORIZATION \$

---

ORIGINAL AMOUNT OF THE CONTINGENCY ALLOWANCE	\$
NET TOTAL OF PREVIOUS AUTHORIZATIONS	\$
PREVIOUS REMAINING CONTINGENCY ALLOWANCE	\$
TOTAL AMOUNT OF THIS AUTHORIZATION	\$
CONTINGENCY ALLOWANCE REMAINING AFTER THIS CONTINGENCY	\$

Recommended By:	Authorized By:	Accepted By:
_____ Architect	_____ Owner	_____ Contractor

---

**END OF SECTION**



## **SECTION 01250 - CONTRACT MODIFICATION PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
  - 1. Section 01600 "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

#### **1.3 MINOR CHANGES IN THE WORK**

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, that may or may not involve an adjustment to the Contract Sum or the Contract Time, as an Architect's Supplemental Instructions, "ASI".

#### **1.4 PROPOSAL REQUESTS**

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time in the form of an ASI. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. ASIs issued by Architect, if adjustments to contract sum or contract time are involved, are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in ASI after receipt of ASI, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    - e. Include data as needed to validate material costs
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include costs of labor and supervision directly attributable to the change.

5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

#### **1.5 CHANGE ORDER PROCEDURES**

- A. On Owner's approval of a Change Order, Architect will issue a Change Order for signatures as required.

#### **1.6 CONSTRUCTION CHANGE DIRECTIVE**

- A. Construction Change Directive, "CCD": Architect may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Construction Change Directive contains a complete description of change in the Work.

**PART 2 – NOT APPLICABLE**

**PART 3 – NOT APPLICABLE**

**END OF SECTION**

## SECTION 01290 - PAYMENT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

#### 1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

#### 1.4 SCHEDULE OF VALUES

- A. **At the discretion of the Architect, the contractor shall provide separate Schedule of Values for work on projects involving multiple locations, campuses, sites, buildings etc. and/or multiple scopes of work. Additional line items may be required within each separate Schedule of Values (i.e. separate line items for multiple buildings located on same site).**
- B. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with Continuation Sheets.
    - b. Submittals Schedule.
    - c. Contractor's Construction Schedule.
  - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- C. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
  - 1. Identification: Include the following Project identification on the Schedule of Values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  - 2. Submit draft of DCM Form C-11.
  - 3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of the Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.

- f. Change Orders (numbers) that affect value.
  - g. Dollar value.
    - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
  5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  6. Provide a separate listing on Application and Certificate for Payment (Standard ABC Form C-10) for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
    - a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or evidence of bonded warehousing.
  7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
  8. Unit Costs: Provide a separate line item in the Schedule of Values for each unit cost. Line-item to show value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
  9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
  10. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## **1.5 APPLICATIONS FOR PAYMENT**

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: Progress payments shall be submitted to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the 23rd of the month.
- C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
  2. Include amounts of Change Orders issued before last day of construction period covered by application only after all agency approvals.
- D. Transmittal: Submit 6 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
  1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

- E. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Schedule of Values.
  3. Contractor's Construction Schedule (preliminary if not final).
  4. Products list.
  5. Schedule of unit prices.
  6. Submittals Schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. List of Contractor's principal consultants.
  9. Copies of building permits.
  10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  11. Initial progress report.
  12. Report of preconstruction conference.
- F. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- G. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. Certificate of Substantial Completion (DCM Form C-13)
  5. Form of Advertisement for Completion (DCM Form C-14)
  6. Evidence that claims have been settled.
  7. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  8. Final, liquidated damages settlement statement.

**PART 2 – NOT APPLICABLE**

**PART 3 – NOT APPLICABLE**

**END OF SECTION**

## **SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Contractor's Construction Schedule.
  - 2. Submittals Schedule.
  - 3. Daily construction reports.
  - 4. Material location reports.
  - 5. Field condition reports.
  - 6. Special reports.
- B. Related Sections include the following:
  - 1. Division 1 Section 01290 "Payment Procedures" for submitting the Schedule of Values.
  - 2. Division 1 Section 01310 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
  - 3. Division 1 Section 01330 "Submittal Procedures" for submitting schedules and reports.
  - 4. Division 1 Section 01322 "Photographic Documentation" for submitting construction photographs.
  - 5. Division 1 Section 01400 "Quality Requirements" for submitting a schedule of tests and inspections.

#### **1.3 SUBMITTALS**

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
  - 1. Scheduled date for first submittal.
  - 2. Specification Section number and title.
  - 3. Submittal category (action or informational).
  - 4. Name of subcontractor.
  - 5. Description of the Work covered.
  - 6. Scheduled date for Architect's final release or approval.
- B. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
- C. Daily Construction Reports: Submit two copies at weekly intervals.
- D. Material Location Reports: Submit two copies at monthly intervals.
- E. Field Condition Reports: Submit two copies at time of discovery of differing conditions.
- F. Special Reports: Submit two copies at time of unusual event.
- G. Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Verify availability of qualified personnel needed to develop and update schedule.
2. Discuss any constraints.
3. Review time required for review of submittals and re-submittals.
4. Review requirements for tests and inspections by independent testing and inspecting agencies.
5. Review time required for completion and startup procedures.
6. Review and finalize list of construction activities to be included in schedule.
7. Review submittal requirements and procedures.
8. Review procedures for updating schedule.

#### **1.4 COORDINATION**

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
  1. Secure time commitments for performing critical elements of the Work from parties involved.
  2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

### **PART 2 - PRODUCTS**

#### **2.1 SUBMITTALS SCHEDULE**

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
  1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
  2. Initial Submittal: Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction Schedule.

#### **2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL**

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
  1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
  1. Activity Duration: Define activities so no activity is longer than 30 days, unless specifically allowed by Architect.
  2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

3. Submittal Review Time: Include review and re-submittal times indicated in Division 1 Section 01330 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
  4. Startup and Testing Time: Include not less than 14 days for startup and testing.
  5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions, if any, and show how the sequence of the Work is affected.
- E. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
1. Refer to Division 1 Section 01290 "Payment Procedures" for cost reporting and payment procedures.
  2. Contractor shall assign cost to construction activities on the CPM schedule. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be broken down within principal contracts in amounts typically not greater than \$30,000, but in no case greater than 5 percent of the Contract Sum.
  3. Each activity cost shall reflect an accurate value subject to approval by Architect.
  4. Total cost assigned to activities shall equal the total Contract Sum.
- F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the time effect, if any, of the proposed change on the overall project schedule.

## **2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)**

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, cost-and resource-loaded, time-scaled CPM network analysis diagram for the Work.
1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
    - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
  2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
  3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  4. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.



1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Preparation and processing of submittals.
    - b. Mobilization and demobilization.
    - c. Purchase of materials.
    - d. Delivery.
    - e. Fabrication.
    - f. Utility interruptions.
    - g. Installation.
    - h. Work by Owner that may affect or be affected by Contractor's activities.
    - i. Testing and commissioning.
  2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
  3. Processing: Process data to produce output data on a computer-drawn, timescaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
  4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
    - a. Sub-networks on separate sheets are permissible for activities clearly off the critical path.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
  2. Description of activity.
  3. Principal events of activity.
  4. Immediate preceding and succeeding activities.
  5. Early and late start dates.
  6. Early and late finish dates.
  7. Activity duration in workdays.
  8. Total float or slack time.
  9. Average size of workforce.
  10. Dollar value of activity (coordinated with the Schedule of Values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations in workdays.
  5. Changes in the critical path.
  6. Changes in total float or slack time.
  7. Changes in the Contract Time.

- G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
  2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
  3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
  4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
    - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
    - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

## **2.4 REPORTS**

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
  2. Approximate count of personnel at Project site by trade.
  3. Equipment at Project site.
  4. Material deliveries.
  5. High and low temperatures and general weather conditions.
  6. Accidents.
  7. Meetings and significant decisions.
  8. Unusual events (refer to special reports).
  9. Stoppages, delays, shortages, and losses.
  10. Meter readings and similar recordings.
  11. Emergency procedures.
  12. Orders and requests of authorities having jurisdiction.
  13. Change Orders received and implemented.
  14. Construction Change Directives and Architect Supplemental Interpretations (Instructions) received and implemented.
  15. Services connected and disconnected.
  16. Equipment or system tests and startups.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request For Interpretation (RFI). Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## **2.5 SPECIAL REPORTS**

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

### **PART 3 - EXECUTION**

#### **3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Contractor must employ skilled personnel with experience in scheduling and reporting techniques or must employ a scheduling consultant. Submit qualifications and examples of previous scheduling for evaluation (and approval) by the Architect.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule three (3) work days before each regularly scheduled progress meeting or Contractor may update schedule at the monthly progress meeting.
  - 1. The revised schedule should be updated immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting, no later than three days after the progress meeting.
  - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  - 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
  - 1. Post copies in Project meeting rooms and temporary field offices.
  - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

### **END OF SECTION**

## **SECTION 01322 - PHOTOGRAPHIC DOCUMENTATION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for the following:
  - 1. Preconstruction digital video.
  - 2. Periodic construction photographs.

#### **1.3 SUBMITTALS**

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each digital photograph. Indicate elevation or story of construction. Include same label information as corresponding set of photographs.
- B. Digital Construction Photographs: Submit one print of each digital photographic view within seven days of taking photographs.
  - 1. Format: Digital.
  - 2. Identification: The following information is required on each CD submitted:
    - a. Name of Project.
    - b. Name of Architect.
    - c. Name of Contractor.
    - d. Date photograph was taken if not date stamped by camera.
    - e. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
    - f. Unique sequential identifier.
  - 3. Digital Images: Submit a complete set of digital image electronic files as a Project Record document on USB Drives. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.
- C. Digital Video: Submit one copy of each digital video with protective sleeve or case within seven days of recording.
  - 1. Identification: On each copy, provide an applied label with the following information:
    - a. Name of Project
    - b. Name of Architect.
    - c. Name of Contractor.
    - d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
    - e. Date digital video was recorded.
    - f. Weather conditions at time of recording.
  - 2. Transcript: To include an audio narrative with the following information as a minimum.
    - a. Name of Project.
    - b. Date digital video was recorded.
    - c. Weather conditions at time of recording.

- d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

## **PART 2 - EXECUTION**

### **2.1 CONSTRUCTION PHOTOGRAPHS**

- A. Film Images:
  1. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.
  2. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Architect.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
  1. Date and Time: Include date and time in filename for each image.
  2. Field Office Images: Maintain one set of images on USB Drives in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.
- C. Preconstruction Photographs: Before starting construction, take color, digital photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
  1. Flag construction limits before taking construction photographs.
  2. Take eight photographs to show existing conditions adjacent to property before starting the Work.
  3. Take eight photographs of existing buildings either on or adjoining property in order to accurately record physical conditions at start of construction.
  4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- D. Periodic Construction Photographs: Take 12 color, digital photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

### **2.2 CONSTRUCTION DIGITAL VIDEO**

- A. Narration: Describe scenes on digital video by audio narration by microphone while video is recorded. Include description of items being viewed, recent events, and planned activities. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.
  1. Confirm date and time at beginning and end of recording.
  2. Begin each digital video with name of Project, Contractor's name, and Project location.
- B. Preconstruction Digital Video: Before starting construction, provide digital video of the Project site and surrounding properties from different vantage points, as needed to properly record all preexisting site conditions and adjacent conditions of all roadways, drives, structures that will incur construction traffic.
  1. Flag construction limits before recording construction video.
  2. Show existing conditions adjacent to Project site before starting the Work.
  3. Show existing buildings either on or adjoining Project site to accurately record physical conditions at the start of construction.
  4. Show protection efforts by Contractor.

**PART 3 – NOT APPLICABLE**

**END OF SECTION**

## SECTION 01330 - SUBMITTAL PROCEDURES

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### 1.2 SUMMARY

- A. The General Contractor shall use website software “**Submittal Exchange**” to conduct all submittal reviews in electronic format. **Paper format submittals will NOT be accepted.** All recordkeeping, date stamping, access controls, shall be **paid for by the Contractor** with access given to the entire Project Team. The software shall be capable of the following:
  - 1. The General Contractor shall include the full cost of Submittal Exchange project subscription in their proposal. **The Contractor shall cover the full cost of Submittal Exchange project subscription for the project. The Contractor contractually, shall be fully responsible for all costs required to maintain full functionality through the acceptance of ALL project closeout requirements and documents.**
  - 2. **Contact Submittal Exchange at [subex-sales\\_ww@oracle.com](mailto:subex-sales_ww@oracle.com) or call 1-800-633-0738 to verify costs prior to bid.**
  - 3. At the Contractor’s option, training is available from **Submittal Exchange** regarding use of website and PDF submittals. Contact Submittal Exchange at 1-800-714-0024 ext. 2
  - 4. Internet Service and Equipment Requirements:
    - a. Email address and Internet access at the Contractor’s main office.
    - b. Adobe Acrobat ([www.adobe.com](http://www.adobe.com)), Bluebeam PDF Revu ([www.bluebeam.com](http://www.bluebeam.com)), or other similar PDF review software for applying electronic stamps and comments.
  - 5. The General Contractor is responsible for maintaining and keeping Submittal Exchange active throughout the entire project, including closeout documents.
- B. Costs:
  - 1. The General Contractor shall include the full cost of Submittal Exchange project subscription in their proposal. **The Contractor shall cover the full cost of Submittal Exchange project subscription for the project. The Contractor contractually, shall be fully responsible for all costs required to maintain full functionality through the acceptance of ALL project closeout requirements and documents.**
  - 2. **Contact Submittal Exchange at [subex-sales\\_ww@oracle.com](mailto:subex-sales_ww@oracle.com) or call 1-800-633-0738 to verify costs prior to bid.**
  - 3. At the Contractor’s option, training is available from **Submittal Exchange** regarding use of website and PDF submittals. Contact Submittal Exchange at 1-800-714-0024 ext. 2
  - 4. Internet Service and Equipment Requirements:
    - a. Email address and Internet access at the Contractor’s main office.
    - b. Adobe Acrobat ([www.adobe.com](http://www.adobe.com)), Bluebeam PDF Revu ([www.bluebeam.com](http://www.bluebeam.com)), or other similar PDF review software for applying electronic stamps and comments.
  - 5. The General Contractor is responsible for maintaining and keeping Submittal Exchange active throughout the entire project, including closeout documents.
- C. Procedures:
  - 1. Shop drawing and product data submittals shall be transmitted to Architect in electronic (PDF) format using **Submittal Exchange**, a website service designed specifically for transmitting submittals between construction team members.
  - 2. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
  - 3. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
  - 4. Submittal Preparation – the Contractor may use any or all of the following options:
    - a. Subcontractors and Suppliers provide electronic (PDF) submittals to the Contractor via the **Submittal Exchange** website.
    - b. Subcontractors and Suppliers provide paper submittals to the General Contractor who electronically scans and converts to PDF format.
    - c. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
  - 5. The Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.
  - 6. The Contractor shall transmit each submittal to Architect using the Submittal Exchange website, [www.submittalexchange.com](http://www.submittalexchange.com).

7. The Architect / Engineer review comments will be made available on the Submittal Exchange website for downloading. Contractor will receive email notice of completed review.
8. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
9. Submit paper copies of reviewed submittals at project closeout for record purposes in accordance with Section 01770 – Closeout Procedures.

D. Related Sections include the following:

1. Division 1 Section 01290 "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 1 Section 01320 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
3. Division 1 Section 01322 "Photographic Documentation" for submitting construction photographs and construction videotapes.
4. Division 1 Section 01770 "Closeout Procedures" for submitting warranties.
5. Division 1 Section 01781 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
6. Division 1 Section 01782 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
7. Division 1 Section 01820 "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
8. Divisions 2 through 16 Sections for specific requirements for submittals in those Sections.

### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

### 1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will, under certain circumstances described hereinafter, be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: Comply with requirements in Division 1 Section 01320 "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.
  1. Initial Review: Allow **14** business days for initial review of each digital submittal. Allow



additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Re-submittal Review: Allow **10** business days for review of each re-submittal.
  4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow **10** business days for initial review of each submittal.
    - a. Structural, mechanical, plumbing, electrical, civil, audio/visual, sound system, and kitchen equipment components are examples of the Work that require sequential review. Architect will advise if there are others.
- E. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings. Provide another area of this same size for the Architect to affix his stamp. Stamp includes the following four categories: Reviewed, Furnish as Noted, Rejected, Revise and Resubmit; the Architect will mark one or more of these categories and return submittal to Contractor.
  3. Include the following information on label for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name and address of Contractor.
    - e. Name and address of subcontractor.
    - f. Name and address of supplier.
    - g. Name of manufacturer.
    - h. Submittal number or other unique identifier, including revision identifier.
      - i. Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.D.2.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., 06100.D.2.R1 (R2, R3 etc. if necessary).
    - i. Number and title of appropriate Specification Section.
    - j. Drawing number and detail references, as appropriate.
    - k. Location(s) where product is to be installed, as appropriate.
    - l. Other necessary identification.
- F. Deviations: Encircle or otherwise specifically identify deviations and list the deviations from the Contract Documents on submittals and list the deviations on the transmittal form accompanying submittal.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
1. Transmittal Form: Use AIA Document G810 or equivalent with at least the following information.
    - a. Project name.
    - b. Date.
    - c. Destination (To:).

- d. Source (From:).
  - e. Names of subcontractor, manufacturer, and supplier.
  - f. Category and type of submittal.
  - g. Submittal purpose and description.
  - h. Specification Section number and title.
  - i. Drawing number and detail references, as appropriate.
  - j. Transmittal number, numbered consecutively.
  - k. Submittal and transmittal distribution record.
  - l. Remarks.
  - m. Signature of transmitter.
2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
- H. Re-submittals: Make re-submittals in same form and number of copies as initial submittal.
- 1. Note date and content of previous submittal.
  - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  - 3. Resubmit submittals until they are marked "Reviewed" or "Furnished as Noted".
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Use only final submittals with mark indicating "Reviewed" or "Furnished as Noted".

## **1.5 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES**

- A. General: At Contractor's written request, copies of Architect's CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
  - 1. Contractor must sign a detailed agreement with the Architect that outlines responsibilities, liabilities, etc. of each party and must pay to the Architect a fee of \$75.00 for each sheet of drawings that are put on a disk for the Contractor's use.

## **PART 2 - PRODUCTS**

### **2.1 DIGITAL ACTION SUBMITTALS**

- A. General: Prepare and submit Digital Action Submittals required by individual Specification Sections.
- B. All submittals shall be sent to the Architect no later than 45 calendar days from "Notice To Proceed".
  - 1. Submittals shall be sent to Greg Anderson at the following email address:  
[andersong@mckeeassoc.com](mailto:andersong@mckeeassoc.com).
- C. Submittals regarding mechanical, plumbing, electrical and structural items shall be sent directly to the Engineer of record.
  - 1. A digital copy of the transmittal shall be sent to the Architect at the following email address:  
[andersong@mckeeassoc.com](mailto:andersong@mckeeassoc.com).
- D. Product Data: Collect information into a single digital submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each the digital submittal to show which products and options are applicable.
3. Include the following information, as applicable:
  - a. Manufacturer's written recommendations.
  - b. Manufacturer's product specifications.
  - c. Manufacturer's installation instructions.
  - d. Standard color charts.
  - e. Manufacturer's catalog cuts.
  - f. Wiring diagrams showing factory-installed wiring.
  - g. Printed performance curves.
  - h. Operational range diagrams.
  - i. Mill reports.
  - j. Standard product operation and maintenance manuals.
  - k. Compliance with specified referenced standards.
  - l. Testing by recognized testing agency.
  - m. Application of testing agency labels and seals.
  - n. Notation of coordination requirements.
4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit digital copy of the Product Data, unless otherwise indicated. Mark up and retain returned digital copy as a Project Record Document.
- E. Digital Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Architect's CAD Drawings are otherwise permitted.
  1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    - f. Shopwork manufacturing instructions.
    - g. Templates and patterns.
    - h. Schedules.
    - i. Design calculations.
    - j. Compliance with specified standards.
    - k. Notation of coordination requirements.
    - l. Notation of dimensions established by field measurement.
    - m. Relationship to adjoining construction clearly indicated.

- n. Seal and signature of professional engineer if specified.
- o. Wiring Diagrams: Differentiate between manufacturer-installed and field installed wiring.
- 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Digital Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.
- 3. Number of Copies:
  - a. Submit each original digital drawing submittal (specifically prepared for the project). Do not include MSDS documentation in any submittal. Architect will retain marked-up copy for his records and will return 1 (one) digital marked-up copy to the Contractor.
  - b. Submit digital copy (bound in sets) of hardware submittals, fixture schedules, manufacturers' data and all other submittals that have been prepared in an 11 inch by 17 inch or smaller format. The Architect will return 1 (one) digital copy set to the Contractor.
    - i. Upon receipt of his digital marked up shop drawings/submittals, the Contractor shall make as many copies for distribution as he deems necessary, however he shall retain one copy to mark-up further to show any and all construction changes that modify the submittal in any form. This document(s) shall be turned over to the Owner at the end of the Project along with the Record Documents.
- F. Color code: On all digital shop drawings submittals, schedules, etc., the Contractor's marks shall be in red, the Architect's in green and the Engineer's (if any involved) in blue. All comments shall be initialed by a responsible party within each organization.
- G. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
  - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  - 2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of appropriate Specification Section.
  - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available. **Colors will not be approved until all color submittals are received by the architect.**
    - a. Number of Samples: Submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one submittal with options selected.
    - b. All color submittals are due within 45 days of the Notice to Proceed.
    - c. The architect will be allowed 15 days from the date of the receipt of the last color submittal to approve colors.
  - 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following:

partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample set and one will be returned. Mark up returned Sample set as a Project Record Sample.
  - i. Construct a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
  - ii. If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- H. Interior Color Selections: Any submittals that are associated with the aesthetics of the interior design shall not be approved until all submittals associated with the interior design are in the Architect's possession.
- I. Submittals Schedule: Comply with requirements specified in Division 1 Section 01320 "Construction Progress Documentation."
- J. Application for Payment: Comply with requirements specified in Division 1 Section 01290 "Payment Procedures."
- K. Schedule of Values: Comply with requirements specified in Division 1 Section 01290 "Payment Procedures."

## **2.2 INFORMATIONAL SUBMITTALS**

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
  - 1. Number of Copies: Submit digital copy of each submittal, unless otherwise indicated.
  - 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
  - 3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section 01400 "Quality Requirements."
- B. Coordination Drawings: Comply with requirements specified in Division 1 Section, 01310 "Project Management and Coordination."
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- J. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- K. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.
  - 3. Time period when report is in effect.
  - 4. Product and manufacturers' names.
  - 5. Description of product.
  - 6. Test procedures and results.
  - 7. Limitations of use.
- L. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- M. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- N. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- O. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section 01782 "Operation and Maintenance Data."
- P. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
  - 1. Preparation of substrates.
  - 2. Required substrate tolerances.
  - 3. Sequence of installation or erection.
  - 4. Required installation tolerances.
  - 5. Required adjustments.
  - 6. Recommendations for cleaning and protection.

- R. **Manufacturer's Field Reports:** Prepare written information documenting factory authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- S. **Insurance Certificates and Bonds:** Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- T. **Construction Photographs and Videotapes:** Comply with requirements specified in Division 1 Section 01322 " Photographic Documentation."
- U. **Material Safety Data Sheets (MSDSs):** Submit information directly to Owner; do not submit to Architect.
1. Architect will not review submittals that include MSDSs and will return the entire submittal for re-submittal.

## **2.3 DELEGATED DESIGN**

- A. **Performance and Design Criteria:** Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. **Delegated-Design Submittal:** In addition to Shop Drawings, Product Data, and other required submittals, submit one copy of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

## **PART 3 - EXECUTION**

### **3.1 CONTRACTOR'S REVIEW**

- A. Review each digital submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. **Approval Stamp:** Stamp each digital submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

### **3.2 ARCHITECT'S ACTION**

- A. **General:** Architect will not review digital submittals that do not bear Contractor's approval stamp and will return them without action.

- B. Action Submittals: Architect will review each digital submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each digital submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
1. REVIEWED—Indicates that reviewed submittal is satisfactory.
  2. REJECTED—Indicates submittal is not satisfactory and another properly prepared submittal of same or another product must be prepared and resubmitted.
  3. FURNISH AS NOTED—Indicates submittal is satisfactory if the changes, modifications, notes, etc. marked by the Architect are made a part of the submittal.
  4. REVISE AND RESUBMIT—Indicates although parts of the submittal are satisfactory, there are enough significant modifications that must be made to require the Contractor, subcontractor, supplier, and/or manufacturer to provide additional essential information to his submittal and then resubmit it to the Architect.
- C. Informational Submittals: Architect will review each submittal and will not return it or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

**END OF SECTION**



## **SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections include the following:
  - 1. Division 1 Section 01100 "Summary" for limitations on utility interruptions and other work restrictions.
  - 2. Division 1 Section 01330 "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
  - 3. Division 1 Section 01700 "Execution Requirements" for progress cleaning requirements.
  - 4. Divisions 2 through 16 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
  - 5. Division 2 Section 02282 "Termite Control" for pest control.

#### **1.3 DEFINITIONS**

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

#### **1.4 USE CHARGES**

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Sewer connections will not be in place for most if not all of the duration of the project. When and if the off-site sewer is installed by others and sewer piping under this contract is installed, should the contractor decide to connect to the sewer he must pay all sewer use charges until the project is turned over to the Owner.
- C. Water Service: Pay water service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

#### **1.5 SUBMITTALS**

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

#### **1.6 QUALITY ASSURANCE**

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

#### **1.7 PROJECT CONDITIONS**

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use

as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## **PART 2 - PRODUCTS**

### **2.1 TEMPORARY FACILITIES**

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
  - 1. **Minimum Requirement: One (1) 10 foot wide x 44 foot long unit required.**
- B. Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel. Keep office clean and orderly. Furnish and equip offices as follows:
  - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
  - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- square tack board.
  - 3. Drinking water and private toilet.
  - 4. Coffee machine and supplies.
  - 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
  - 6. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  - 1. Store combustible materials apart from building.

### **2.2 EQUIPMENT**

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction and marked for intended use.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION, GENERAL**

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### **3.2 TEMPORARY UTILITY INSTALLATION**

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services. Sanitary Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

2. Connect temporary sanitary sewer from construction office to a submerged temporary holding tank, as directed by authorities having jurisdiction.
  3. Provide erosion control structures to drain storm water from site.
- B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction from existing water lines in the street. Contractor shall pay for any metering costs and associated fees required by the City Water Department.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
1. Toilets: Use of Owner's existing toilet facilities will not be permitted.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Provide temporary electric meter power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. Contractor shall be responsible for any charges associated with said service.
1. Install electric power service overhead, unless otherwise indicated.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line for each field office.
1. Provide additional telephone lines for the following:
    - a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
  2. At each telephone, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Architect's office.
    - e. Engineers' offices.
    - f. Owner's office.
    - g. Principal subcontractors' field and home offices.
  3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- I. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities, or other suitable high speed internet connection.
1. Provide DSL in primary field office.

### **3.3 SUPPORT FACILITIES INSTALLATION**

- A. General: Comply with the following:
  - 1. Provide incombustible construction for offices, shops, and sheds located within construction area with good visibility of construction. Comply with NFPA 241.
  - 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
  - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
- D. Project Identification and Temporary Signs: Erect Project identification, General Contractor's sign, Architect's sign and other signs as approved. Install signs where directed to inform public and individuals seeking entrance to Project. Subcontractor signs are not permitted.
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
- F. Temporary Stairs: Until permanent stairs are available, provide one temporary stair between floors, located near the center of the building.
- G. Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

### **3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION**

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - 1. Comply with work restrictions specified in Division 1 Section "Summary."
- B. Temporary Erosion and Sedimentation Control: Comply with requirements specified in Division 2 02100 Section "Site Preparation."
- C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
- F. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Prohibit smoking in construction areas.

2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

### **3.5 OPERATION, TERMINATION, AND REMOVAL**

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  1. Materials and facilities that constitute temporary facilities are property of Contractor. Carefully remove and turn over Architect's sign to the Architect.
  2. Where area is intended for landscape development, in an area that has been used as a compacted temporary road bed, remove soil and aggregate fill that do not comply with requirements for landscaping fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
  3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section 01770 "Closeout Procedures."

### **END OF SECTION**

## **SECTION 01600 - PRODUCT REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and equal products.
- B. Related Sections include the following:
  - 1. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

#### **1.3 DEFINITIONS**

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Equal Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating equal products of other named manufacturers.

#### **1.4 SUBMITTALS**

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
  - 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
  - 2. Form: Tabulate information for each product under the following column headings:
    - a. Specification Section number and title.
    - b. Generic name used in the Contract Documents.
    - c. Proprietary name, model number, and similar designations.
    - d. Manufacturer's name and address.
    - e. Supplier's name and address.
    - f. Installer's name and address.
    - g. Projected delivery date or time span of delivery period.

- h. Identification of items that require early submittal approval for scheduled delivery date.
- 3. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
- 4. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.
- B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use CSI Form 13.1A.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified materials or products cannot be provided.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
    - j. Cost information, including a proposal of change, if any, in the Contract Sum.
    - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
    - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
  - a. Form of Acceptance: Change Order.
  - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

- c. If Contractor's Substitution Requests are repeatedly (i.e. 3 times) submitted incomplete, i.e., no definitive response to items "a" through "l", the Architect will not consider any further Substitution Requests.
- C. Equal Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of an equal product request. Architect will notify Contractor of approval or rejection of proposed equal product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
    - a. Use product specified if Architect cannot make a decision on use of an equal product request within time allocated.
- D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section 01330 "Submittal Procedures." Show compliance with requirements.

## **1.5 QUALITY ASSURANCE**

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
- B. The Contractor MUST provide the Owner with a Certificate of Asbestos Free Building Materials at the end of the project certifying that all building materials incorporated, installed, and used during the construction process of the project by the Contractor or its Subcontractors of any tier are 100% asbestos free. Asbestos Free means containing 0% asbestos in any form. The Certificate of Asbestos Free Building Materials form is included in the project manual.

## **1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
  - 1. Store products to allow for inspection and measurement of quantity or counting of units.
  - 2. Store materials in a manner that will not endanger Project structure.
  - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
  - 4. Store cementitious products and materials on elevated platforms.
  - 5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
  - 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.



7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.
9. Materials Stored Off Site: Unless otherwise provided in the Contract Documents, the Contractor's cost of materials and equipment to be incorporated into the Work, which are stored off the site, may also be considered in monthly Applications for Payment under the following conditions:
  - a. The contractor has received written approval from the Architect and Owner to store the materials or equipment off site in advance of delivering the materials to the off site location.
  - b. A Certificate of Insurance is furnished to the Architect evidencing that a special insurance policy, or rider to an existing policy, has been obtained by the Contractor providing all-risk property insurance coverage, specifically naming the materials or equipment stored, and naming the Owner as an additionally insured party.
  - c. The Architect is provided with a detailed inventory of the stored materials or equipment and the materials or equipment are clearly marked in correlation to the inventory to facilitate inspection and verification of the presence of the materials or equipment by the Architect or Owner.
  - d. The materials or equipment are properly and safely stored in a bonded warehouse, or a facility otherwise approved in advance by the Architect and Owner.
  - e. Compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest.

## **1.7 PRODUCT WARRANTIES**

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
  1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Warranty start for mechanical and electrical equipment being date of substantial completion.
- D. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
  1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Equal Products" Article to obtain approval for use of an unnamed product.

E. Product Selection Procedures:

1. Products and Manufacturers: In particular instances there may only be a single product or manufacturer appropriate for use on the project, in which case where Specifications name a single product and manufacturer and say "no equal", provide the named product.
2. Products and Manufacturers: When one or two products or manufacturers are specified and have the words "or approved equal", the Contractor may propose to provide alternatives in the form of a Substitution Request which once reviewed by the Architect will be either accepted or rejected. If Substitution Request is submitted for approval 7 days prior to the receipt of bids and approved by the Architect, said approvals will be included in Addenda. Only those Substitution Requests listed as approved in Addenda may bid the project.
3. Products and Manufacturers: Where Specifications include a list of three (3) or more names of both products and manufacturers, provide one of the products listed that complies with requirements. No substitutions will be accepted.
4. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or an equal product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.
5. Visual Matching Specification: Where Specifications require matching an established Sample, product must comply with all requirements and must match Architect's sample. Architect's decision will be final on whether a proposed product matches.
  - a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product
6. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
  - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
  - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 1.8 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution under the conditions set forth in this section under Product Selection Procedures, if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
- B. Conditions: Architect will consider Contractor's request for substitution under the conditions set forth in this section under Product Selection Procedures and when the following conditions are satisfied. If the following conditions are not satisfied,

- C. Architect will return requests without action, except to record noncompliance with these requirements:
1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
  2. Requested substitution requires no or only very minor revisions (as determined by the Architect), to the Contract Documents.
  3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  4. Substitution request is fully documented and properly submitted.
  5. Requested substitution will not adversely affect Contractor's Construction Schedule.
  6. Requested substitution has received necessary approvals of authorities having jurisdiction.
  7. Requested substitution is compatible with other portions of the Work.
  8. Requested substitution has been coordinated with other portions of the Work.
  9. Requested substitution provides specified warranty.
  10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

**PART 2 - NOT APPLICABLE**

**PART 3 - NOT APPLICABLE**

**END OF SECTION**

## **SECTION 01700 - EXECUTION REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. General installation of products.
  - 4. Coordination of Owner-installed products.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
  - 8. Correction of the Work.
- B. Related Sections include the following:
  - 1. Division 1 Section 01310 "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
  - 2. Division 1 Section 01330 "Submittal Procedures" for submitting surveys.
  - 3. Division 1 Section 01770 "Closeout Procedures" for submitting Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

#### **1.3 SUBMITTALS**

- A. Qualification Data: For professional engineer.
- B. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.
- C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- D. Certified Surveys: Submit two copies signed by professional engineer.

#### **1.4 QUALITY ASSURANCE**

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

### **PART 2 - EXECUTION**

#### **2.1 EXAMINATION**

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
  - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction

indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
    - a. Description of the Work.
    - b. List of detrimental conditions, including substrates.
    - c. List of unacceptable installation tolerances.
    - d. Recommended corrections.
  2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

## **2.2 PREPARATION**

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on RFI, "Request for Interpretation."

## **2.3 CONSTRUCTION LAYOUT**

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
  1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required

dimensions.

3. Inform installers of lines and levels to which they must comply.
  4. Check the location, level and plumb, of every major element as the Work progresses.
  5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
  6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

## **2.4 FIELD ENGINEERING**

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
  2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data on Project Record Documents.
  2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- D. Final Property Survey: Submit a final property survey certifying exact locations of site improvements including building(s), parking lots, roadways and utilities including structure elevations, top and invert, distances from property lines, and with any variation from the original civil staking and layout and utility drawings identified.

## **2.5 INSTALLATION**

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
  2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
  4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling unless shown otherwise on drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
  - C. Install products at the time and under conditions that will ensure the best possible results.
  - D. Maintain conditions required for product performance until Substantial Completion.
  - E. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
  - F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
  - G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
  - H. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
    1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
    2. Allow for building movement, including thermal expansion and contraction.
    3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
  - I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
  - J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

## **2.6 OWNER-INSTALLED PRODUCTS**

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
  1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
  2. Pre-installation Conferences: Include Owner's construction forces at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

## **2.7 PROGRESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
  1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
  3. Containerize hazardous and unsanitary waste materials separately from other waste.

Mark containers appropriately and dispose of legally, according to regulations.

- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

## **2.8 STARTING AND ADJUSTING**

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section 01400 "Quality Requirements."

## **2.9 PROTECTION OF INSTALLED CONSTRUCTION**

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

## **2.10 CORRECTION OF THE WORK**

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.



- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

**PART 3 – NOT APPLICABLE**

**END OF SECTION**

## **SECTION 01770 - CLOSEOUT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- B. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures.
  - 2. Warranties.
  - 3. Final cleaning.

#### **1.3 SUBSTANTIAL COMPLETION**

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
  - 6. Deliver spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 8. Complete startup testing of systems.
  - 9. Submit test/adjust/balance records.
  - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 11. Advise Owner of changeover in heat and other utilities.
  - 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  - 13. Complete final cleaning requirements, including touchup painting.
  - 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

#### **1.4 FINAL COMPLETION**

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
  1. Submit a final Application for Payment according to Division 1 Section 01290 "Payment Procedures."
  2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  4. Submit pest-control final inspection report and warranty.
  5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### **1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)**

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  1. Mark the Architect's punch-list so-as-to identify those items that are still outstanding and uncorrected at the time of submission.

#### **1.6 WARRANTIES**

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## **PART 3 - EXECUTION**

### **3.1 FINAL CLEANING**

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for Project.
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - f. Remove labels that are not permanent.
    - g. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
      - i. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
    - h. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - i. Replace parts subject to unusual operating conditions.
    - j. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - k. Clean ducts, blowers, and coils if units were operated without filters during construction.
    - l. Leave Project clean and ready for occupancy.

### **END OF SECTION**

## **SECTION 01781 - PROJECT RECORD DOCUMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- B. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Digital Record Drawings.
  - 2. Digital Record Specifications.
  - 3. Digital Record Product Data.

#### **1.3 SUBMITTALS**

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set of digitally scanned marked-up Record Prints.
- B. Record Specifications: Submit one copy of digitally scanned Project Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one digitally scanned copy of each Product Data submittal.
- D. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

### **PART 2 - PRODUCTS**

#### **2.1 RECORD DRAWINGS**

- A. Record Prints: Maintain one clean set of blue- or black-line white prints of the Contract Drawings and Shop Drawings and one copy of the project manual (specification) at the job site for the sole purpose of recording changes to the drawings and specifications.
- B. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
  - 1. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
  - 2. Accurately record information in an understandable drawing technique.
  - 3. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
- C. Content: Types of items requiring marking include, but are not limited to, the following:
  - 1. Dimensional changes to Drawings.
  - 2. Revisions to details shown on Drawings.
  - 3. Locations and depths of underground utilities.
  - 4. Revisions to routing of piping and conduits.
  - 5. Revisions to electrical circuitry.
  - 6. Actual equipment locations.
  - 7. Duct size and routing.
  - 8. Locations of concealed internal utilities.

9. Changes made by Change Order or Construction Change Directive. (Posted on Documents.)
  10. Changes made following Architect's written orders, i.e. ASIs. (Posted on Documents.)
  11. Details not on the original Contract Drawings. (Posted on Documents.)
  12. Field records for variable and concealed conditions.
  13. Record information on the Work that is shown only schematically.
  14. Changes made in response to Contractor's questions, i.e. RFIs. (Posted on Documents.)
- D. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  - E. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  - F. Mark important additional information that was either shown schematically or omitted from original Drawings.
  - G. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable. Where posting is required, post on Drawing Set and in Specifications on sheets or pages adjacent to or on top of where modification applies.
  - H. Attachment method shall be taped at top only, so as to access original underneath.
  - I. Digitally scan all documents and provide on CD Rom to Architect.

## **2.2 RECORD SPECIFICATIONS**

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications. Maintain one clean copy of the project manual (specification) at the job site for the sole purpose of recording changes to the drawings and specifications.
  1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
  5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.
- B. Digitally scan all documents and provide on CD Rom to Architect.

## **2.3 RECORD PRODUCT DATA**

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
- B. Maintain one clean set at the job site for the sole purpose of recording changes to the drawings and specifications.
  1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  3. Note related Change Orders, Record Specifications and Record Drawings where applicable.
- C. Digitally scan all documents and provide on CD Rom to Architect.

## **2.4 MISCELLANEOUS RECORD SUBMITTALS**

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

### **PART 3 - RECORDING AND MAINTENANCE**

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours. Architect's representative will review Record Documents with the project superintendent each month to determine to his satisfaction whether or not Record Documents are being kept up to date. Failure to do so will result in the delay of processing pay request until Record Documents are brought up to date.

### **END OF SECTION**

## **SECTION 01782 - OPERATION AND MAINTENANCE DATA**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
  - 2. Emergency manuals.
  - 3. Operation manuals for systems, subsystems, and equipment.
  - 4. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.

#### **1.3 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

#### **1.4 SUBMITTALS**

- A. Submittal: Submit one copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.
  - 1. Correct or modify each manual to comply with Architect's comments. Submit three copies of each corrected manual within 15 days of receipt of Architect's comments.

#### **1.5 COORDINATION**

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

### **PART 2 - PRODUCTS**

#### **2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY**

- A. Organization: Include a section in the directory for each of the following:
  - 1. List of documents.
  - 2. List of systems.
  - 3. List of equipment.
  - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE

Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."



## 2.2 MANUALS, GENERAL

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  - 1. Title page.
  - 2. Table of contents.
  - 3. Manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Name and address of Owner.
  - 4. Date of submittal.
  - 5. Name, address, and telephone number of Contractor.
  - 6. Name and address of Architect.
  - 7. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
  - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
  - 1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
  - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
  - 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
  - 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual,

insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## **2.3 EMERGENCY MANUALS**

- A. Content: Organize manual into a separate section for each of the following:
  - 1. Type of emergency.
  - 2. Emergency instructions.
  - 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
  - 1. Fire.
  - 2. Flood.
  - 3. Gas leak.
  - 4. Water leak.
  - 5. Power failure.
  - 6. Water outage.
  - 7. System, subsystem, or equipment failure.
  - 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
  - 1. Instructions on stopping.
  - 2. Shutdown instructions for each type of emergency.
  - 3. Operating instructions for conditions outside normal operating limits.
  - 4. Required sequences for electric or electronic systems.
  - 5. Special operating instructions and procedures.

## **2.4 OPERATION MANUALS**

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
  - 1. System, subsystem, and equipment descriptions.
  - 2. Performance and design criteria if Contractor is delegated design responsibility.
  - 3. Operating standards.
  - 4. Operating procedures.
  - 5. Operating logs.
  - 6. Wiring diagrams.
  - 7. Control diagrams.
  - 8. Piped system diagrams.
  - 9. Precautions against improper use.
  - 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
  - 1. Product name and model number.

2. Manufacturer's name.
  3. Equipment identification with serial number of each component.
  4. Equipment function.
  5. Operating characteristics.
  6. Limiting conditions.
  7. Performance curves.
  8. Engineering data and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

## **2.5 PRODUCT MAINTENANCE MANUAL**

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
  2. Manufacturer's name.
  3. Color, pattern, and texture.
  4. Material and chemical composition.
  5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
  2. Types of cleaning agents to be used and methods of cleaning.
  3. List of cleaning agents and methods of cleaning detrimental to product.
  4. Schedule for routine cleaning and maintenance.

5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  1. Include procedures to follow and required notifications for warranty claims.

## **2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL**

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  1. Standard printed maintenance instructions and bulletins.
  2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  3. Identification and nomenclature of parts and components.
  4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  1. Test and inspection instructions.
  2. Troubleshooting guide.
  3. Precautions against improper maintenance
  4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  5. Aligning, adjusting, and checking instructions.
  6. Demonstration and training videotape, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
  1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service: Some equipment and products require maintenance by the manufacturer, supplier or subcontractor, i.e., an authorized service representative, as part of the warranty. The General Contractor shall ensure that said maintenance work is done and provide copies of service reports to the Owner.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  1. Include procedures to follow and required notifications for warranty claims.

## **PART 3 - EXECUTION**

### **3.1 MANUAL PREPARATION**

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
  - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
  - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
  - 2. Comply with requirements of Record Drawings in Division 1 Section 01781 "Project Record Documents."
- G. Comply with Division 1 Section 01770 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

### **END OF SECTION**

## **SECTION 01820 - DEMONSTRATION AND TRAINING**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
  - 3. Demonstration and training digital media.

#### **1.3 SUBMITTALS**

- A. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 1. At completion of training, submit one complete training manual for Owner's use.

#### **1.4 QUALITY ASSURANCE**

- A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 1 Section 01400 "Quality Requirements," experienced in operation and maintenance procedures and training.

#### **1.5 COORDINATION**

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

### **PART 2 - PRODUCTS**

#### **2.1 INSTRUCTION PROGRAM**

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up instructional equipment at instruction location.

#### **3.2 INSTRUCTION**

- A. Instructor: Engage a qualified instructor to prepare instruction program and training modules, and

to coordinate between Contractor and Owner for number of participants, instruction times, and location.

- B. Instructor shall demonstrate to Owner's personnel how to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.

**END OF SECTION**

## **SECTION 02070 - SELECTIVE DEMOLITION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Extent of demolition work is shown on drawings, as well as all items necessary to complete new work indicated on plans.
- B. Schedule of Demolition Work: Demolition includes but is not limited to the following:
  - 1. Any damage to existing facilities at the site after the Contractor takes possession shall be repaired by this Contractor at his expense.
  - 2. Contractor shall replace grass/sod damaged during the construction. Fill in ruts caused by equipment with topsoil and grass over to match existing conditions.
  - 3. As indicated on the Drawings.
  - 4. All other items indicated required to be demolished to complete new work.

#### **1.3 SUBMITTALS**

- A. Schedule: Submit proposed methods and operations of demolition work to Architect for review prior to start of work. Include in schedule coordination for shut-off, capping and continuation of utility services as required.
  - 1. Provide a detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

#### **1.4 JOB CONDITIONS**

- A. Condition of Structures: Conditions existing at time of inspection for bidding purposes will be maintained by Owner in so far as practicable.
- B. Explosives: Use of explosives will not be permitted.
- C. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- D. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- E. Protections: Ensure safe passage of persons (night or day) around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities and persons.
  - 1. Erect temporary covered passageways as required by authorities having jurisdiction.
  - 2. Provide temporary fencing as necessary to secure the limits of construction. Fencing shall be substantial to deter passage, fencing material shall be at Contractors discretion.
- F. Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to Owner.
- G. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
  - 1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
  - 2. All electrical work to be removed, relocated or reconnected shall be performed by a licensed Electrical Contractor in accordance with the NEC and any applicable local codes and ordinances.



**PART 2 – PRODUCTS [NOT APPLICABLE]**

**PART 3 - EXECUTION**

**3.1 DEMOLITION - DISPOSAL OF DEMOLISHED MATERIALS**

- A. General: Remove from site debris, rubbish and other materials resulting from demolition operations.
- B. Burning of removed materials from demolished structures will not be permitted on site.
- C. Removal: Transport materials removed from demolished structures and legally dispose of off-site, in area approved by all local authorities and ADEM.

**END OF SECTION**

## SECTION 02100 - SITE PREPARATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- B. Perform site preparation work as shown and specified. Site preparation includes, but is not limited to the following:
  - 1. Protection of existing trees to remain
  - 2. Removal of trees and other vegetation.
  - 3. Stripping and stockpiling of topsoil.
  - 4. Clearing and grubbing.
  - 5. Removing above grade improvements.
  - 6. Removing below grade improvements.
  - 7. Installation of erosion control devices.

#### 1.3 JOB CONDITIONS

- A. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing. Leave all protection in place and maintain until construction work has been completed and all danger of damage has passed. Protection shall be removed only after approval is given by Architect.

#### 1.4 QUALITY ASSURANCE

- A. **The General Contractor shall obtain (*In accordance with ADEM Admin. Code Chapter 335-6-12*) an ADEM storm water permit from the State of Alabama. An NPDES construction site also includes construction sites, irrespective of size, whose stormwater discharges have a reasonable potential to be a significant contributor of pollutants to a water of the State, or whose stormwater discharges have a reasonable potential to cause or contribute to a violation of an applicable Alabama water quality standard as determined by the Department. The General Contractor shall include in Base Bid all permit fees associated to obtain this permit. The Contractor shall submit a Notice of Registration, the fee and develop a Construction Best Management Practices Plan (CBMPP) prior to construction and shall maintain all erosion control measures until the permit is relinquished.**
- A. The Contractor shall use care when working near existing and future installed Best Management Practice (BMP) structures to prevent damage to the structures resulting in erosion and storm water runoff containing silt and soil from the site. The Contractor shall walk the site and verify the condition of the BMP structures during the execution of the work. Any repair work that is deemed necessary as a result of damage caused by the Contractor shall be the responsibility of the Contractor and shall be performed prior to payment of the next scheduled payment application.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Temporary Soil Erosion and Sediment Control Items: Items including silt fence, wattles, inlet protection, sand bags and other erosion control items are to meet the requirements of Section 665 of the Alabama Department of Transportation Standard Specifications for Highway Construction (ALDOTSSHC), latest edition.

## **PART 3 - EXECUTION**

### **3.1 EROSION CONTROL**

- A. Prior to the starting of any work, install erosion control measures as required in the Erosion Control or Best Management Practice Plan. Maintain all erosion control measures in place during full construction period and until such time as the site is substantially vegetated. Install erosion control measures in accordance with Section 665 of the Alabama Department of Transportation Standard Specifications for Highway Construction (ALDOTSSH), latest edition, and the manufacturer's recommendations. Inspection of the silt fence shall be daily, and repair or replacement must be made promptly as required. Any sediment collected by the erosion control measures must be removed when it reaches 6" in height. Erosion control measures shall be removed only after approval is given by the Architect. Removal of erosion control measures is to be carried out by the Contractor who installed the measures.

### **3.2 SITE CLEARING**

- A. General: Remove vegetation, improvements or obstructions interfering with installation of new construction and within limits indicated on the Drawings. Remove all demolished items from the site. Removal includes digging out stumps and roots. Carefully and cleanly cut roots and branches of trees indicated to be left standing where such roots and branches obstruct new construction.
- B. Clearing and Grubbing: Clear site of trees, shrubs and other vegetation, except for those indicated to be left standing. Completely remove stumps, roots and other debris protruding through ground surface. Do not grub inside the drip line of trees to remain. On site burning is not permitted.
- C. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 8" loose depth and thoroughly compact to a density equal to adjacent original ground.
- D. Positive drainage must be maintained or installed by the Contractor to insure that storm water runoff flows to the proper drainage structure or swale.
- E. Restore all areas disturbed by construction activities and which are outside the limits of clearing as indicated on the drawing to their original condition. The expense for this work will be borne by the contractor. The work must be in accordance with the directions of the Architect.

### **3.3 STRIPPING TOPSOIL**

- A. Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2" in diameter, and without weeds, roots and other objectionable material. Strip topsoil to its full depth at all areas to be regraded, resurfaced or paved in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping. Where trees are indicated to be left standing, stop topsoil stripping at drip line, unless directed otherwise, to prevent damage to main root system. Stockpile topsoil in storage piles in a location acceptable to the Architect. Construct storage piles to freely drain surface water. Cover storage piles if required to prevent wind-blown dust. Maintain topsoil storage piles separate from other stockpiled soil materials.

### **3.4 SITE IMPROVEMENTS**

- A. Remove above grade and below grade improvements necessary to permit construction, and other work as indicated. Abandonment or removal of certain underground pipe or conduits are shown on the civil drawings and is included under work of those sections. Removal of abandoned underground piping or conduit interfering with construction is included under this section.

### **3.5 DISPOSAL OF WASTE MATERIAL**

- A. Removal from Owner's Property: Remove waste materials, including unacceptable excavated materials, trash and debris, and legally dispose of it off Owner's property site, in area approved by all local authorities and ADEM.

## **END OF SECTION**

## SECTION 02200 – EARTHWORK

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.
- B. Geotechnical Report is included at the end of this section and is an integral part of this specification.**

#### 1.2 DESCRIPTION OF WORK

- A. Extent of earthwork is indicated on drawings.
  - 1. Rough grading
  - 2. Preparation of subgrade for building slabs and walks is included as part of this work.
  - 3. Drainage fill course for support of building slabs is included as part of this work.
- B. Excavation for Mechanical/Electrical Work: Refer to Division 15 and 16 sections for excavation and backfill required in conjunction with underground mechanical and electrical utilities and buried mechanical and electrical appurtenances; not work of this section.
- C. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- D. Testing and Inspection Service:
- E. The **Owner** will select a firm for soil testing and inspection service for quality control testing during earthwork, and Owner to pay costs.
- F. Retesting of rejected materials and installed work shall be done at the Contractor's expense.
- G. Referenced Standards: Where the term "Referenced Standard" is used in these Project Specifications, it shall be interpreted as **referring to the current edition of "Standard Specifications for Highway Construction, 2018 or latest edition" of Alabama Department of Transportation "**. Referenced Divisions of the "Standard" are hereby made a part of this Project Specification insofar as they may be termed applicable. In no case will requirements for "Method of Measurement" and "Basis of Payment" be considered as applicable to this Project Specification.

#### 1.3 JOB CONDITIONS

- A. Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
- B. Should uncharted or incorrectly charted, piping or other utilities be encountered during excavation, consult utility Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
- C. Use of Explosives: The use of explosives is not permitted.
- D. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
  - 1. Perform excavation within drip-line of large trees to remain by hand and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

## **PART 2 – PRODUCTS [NOT APPLICABLE]**

### **PART 3 - EXECUTION**

#### **3.1 GENERAL**

- A. Prior to the start of excavation and fill placement, the site should be cleared of existing improvements. Additionally, remnant elements associated with previously demolished structures, should be removed. Demolition should include removal of pavements, slabs, and all below grade structures including basement slabs, foundations, and walls. Utility lines will require routing or removal, as appropriate.
- B. Any existing fill materials that are encountered in the planned building area should be completely removed, plus 10 feet beyond.
- C. Areas that are at final grade, or that will require new fill placement, should be evaluated through proofrolling, prior to new fill placement or construction.
- D. Vegetation, topsoil, rootmat, and all organic materials should be completely removed from the site. Excavations resulting from demolition and vegetation removal should be backfilled in a controlled manner with engineered fill.

#### **3.2 FILL PLACEMENT**

- A. All material used as structural fill should be relatively free of organics and other deleterious materials. Soil fill should exhibit a Liquid Limit less than 50, a Plasticity Index less than 30, and a maximum dry density of at least 100 pcf. Soil fill should contain no more than 30% rock, and individual rock fragments in the fill should be less than 4 inches in largest dimension.
- B. Soil fill must be placed in an environment free of excess water. Therefore, free-draining granular material (such as ALDOT # 57 crushed aggregate) should be used as the initial lift(s) of fill in areas containing water seepage.
- C. Soil fill should be placed in lifts not exceeding eight inches in loose measure. Individual lifts of fill should be moisture conditioned to within  $\pm 2\%$  of the optimum moisture content and compacted to a minimum of 98% of the Standard Proctor (ASTM D -698) maximum dry density.
- D. Soil may require wetting or drying to achieve proper compaction. Thinner lifts and manually operated equipment will be required to achieve proper compaction in limited access areas such as utility trenches and around manholes and inlets.
- E. Soil compaction testing should be performed during fill placement. Testing will give an indication of the contractor's performance with regard to soil density and moisture content requirements established in the project specifications. Compaction testing should be performed at random locations on each lift of fill placed to provide statistically relevant testing data. The frequency of density testing should be at least one test per lift for every 2,500 square feet of fill placed in building areas and 10,000 square feet in pavement and sidewalk areas (minimum of 3 tests per lift). Each lift of fill placed in utility trenches should be tested on 50-foot centers. A minimum of 3 tests should be performed on all fill lifts.
- F. Following construction, the foundations and underlying soils should be isolated from sources of excess water. Grades adjacent to the structure should be adjusted so that surface water flows away from the foundations. In no case should water be allowed to pond over newly-constructed footings. Roof drains and downspouts from the new buildings should be directed away from the foundations. Additionally, soils adjacent to foundations should consist of properly compacted, engineered fill to minimize water infiltration. The on-site soils contained fine-grained particles and will be adversely affected by excess water.
- G. To reduce the potential for water migration through the floor slab, ground-supported slabs should be underlain by a capillary break consisting of a minimum of 4 inches of compacted, free-draining, coarse, granular material (such as ALDOT #57 crushed stone). Depending on the type of floor coverings to be used, the owner may also elect to install a vapor barrier typically consisting of 10 mil polyethylene sheeting. The sheeting will reduce the infiltration of water vapor through the slab and the potential for damage to floor coverings. Note, that the use of a vapor barrier will increase the potential for plastic shrinkage cracking during curing of the concrete slab.

### 3.3 EXCAVATION

- A. Excavation is Unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- B. Earth Excavation includes excavation of pavements and other obstructions visible on ground surface; underground structures, utilities and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.
- C. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect/Engineer. Unauthorized excavation, as well as remedial work directed by Architect/Engineer, shall be at Contractor's expense.
- D. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Architect/Engineer.
- E. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Architect/Engineer.
- F. Additional Excavation: When excavation has reached required sub-grade elevations, notify Architect/Engineer who will make an inspection of conditions.
- G. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect/Engineer.
- H. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.
- I. Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
- J. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- K. Dewatering: See civil drawings for drainage plan recommendation for controlling ground water during initial construction phase. Prevent surface water from flowing into excavations and from flooding project site and surrounding area.
- L. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
- M. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
- N. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
- O. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
- P. Dispose of excess soil material and waste materials as herein specified.
- Q. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
- R. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

- S. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown.
- T. Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit. Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations.
- U. Where rock is encountered, carry excavation 6" below required elevation and backfill with a 6" layer of crushed stone or gravel prior to installation of pipe.
- V. Except as otherwise indicated, excavate for exterior waterbearing piping (water, steam, condensate, drainage) so top of piping is not less than 2'-6" below finished grade.
- W. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
- X. Backfill trenches with concrete where trench excavations pass within 18" of column or wall footings and which are carried below bottom of such footings, or which pass under wall footings. Place concrete to level of bottom of adjacent footing.
  - 1. Concrete is specified in Division 3.
- Y. Do not backfill trenches until tests and inspections have been made and backfilling authorized by Architect/Engineer. Use care in backfilling to avoid damage or displacement of pipe systems.
- Z. Excavation for utilities shall conform to manufacturer's recommendations for the type material used.
- AA. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

### **3.4 COMPACTION**

- A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
- B. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D 698; and not less than the following percentages of relative density determined in accordance with ASTM D 2049, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils).
  - 1. Structures, Building Slabs and Steps and Pavements: Compact top 6" of subgrade and each layer of backfill (not exceeding 8" maximum) or fill material to not less than 98% of maximum density.
  - 2. Lawn or Unpaved Areas: Compact top 6" of subgrade and each layer or backfill or fill material to not less than 90% of maximum density for cohesive soils and 90% of relative density for cohesionless soils.
  - 3. Walkways: Compact top 6" of subgrade and each layer of backfill or fill material to not less than 95% of maximum density.
- C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
- D. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
  - 1. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

### **3.5 BACKFILL AND FILL**

- A. General: Place acceptable soil material in layers to required subgrade elevations, for each area

classification listed below.

1. Utility Trenches backfill according to manufacturer's recommendation for the type material used.
  2. In excavations, use satisfactory excavated or borrow material.
  3. Under grassed areas, use satisfactory excavated or borrow material.
  4. Under structures, building slabs, steps and pavements and after grading operations, thoroughly mix top 6" of subgrade and compact to a density not less than 98% of maximum density.
  5. Under walks and pavements, use satisfactory excavated or borrow material, or combination of both.
  6. Under building slabs, use drainage fill material.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
  2. Inspection, testing, approval, and recording locations of underground utilities.
  3. Removal of concrete formwork.
  4. Removal of trash and debris.
- C. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
- D. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- E. Placement and Compaction: Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand-operated tampers.
- F. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
- G. Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

### **3.6 GRADING**

- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding.
- C. Finish surfaces free from irregular surface changes, and as follows:
1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.2' above or below required subgrade elevations.
  2. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.



3. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.
- D. Grading Surface or Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a 10' straightedge.
- E. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

### **3.7 BUILDING SLAB DRAINAGE COURSE**

- A. General: Drainage course consists of placement of drainage fill material, in layers of indicated thickness, over subgrade surface to support concrete building slabs.
- B. Placing: Place drainage fill material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.
- C. When a compacted drainage course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

### **3.8 FIELD QUALITY CONTROL**

- A. Quality Control Testing During Construction: Allow approved testing laboratory to inspect and approve subgrades and fill layers before further construction work is performed.
  1. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), or ASTM D 2922 (nuclear method) as applicable.
  2. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Architect/Engineer.
  3. Paved Areas Subgrade: Make at least one field density test of subgrade for every 10,000 sq. ft. of paved area, but in no case less than 2 tests. In each compacted fill layer, make one field density test for every 10,000 sq. ft. of overlaying paved area, but in no case less than 2 tests
  4. Building Slab Subgrade: Make at least one field density test of subgrade for every 2500 sq. ft. of paved area or building slab, but in no case less than 2 tests. In each compacted fill layer, make one field density test for every 2500 sq. ft. of overlaying building slab or paved area, but in no case less than 2 tests.
  5. Foundation Wall Backfill: Take at least 2 field density tests, at locations and elevations as directed.
- B. If in opinion of Architect/Engineer, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

### **3.9 MAINTENANCE**

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.
- D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work and eliminate evidence of restoration to greatest extent possible.

### **3.10 DISPOSAL OF EXCESS AND WASTE MATERIALS**

- A. Removal from Owner's Property: Remove waste materials, including unacceptable excavated materials, trash and debris, and legally dispose of it off Owner's property site, in area approved by all local authorities and ADEM.

**END OF SECTION**



## Report of Geotechnical Exploration

### **Proposed Elberta High School Additions**

13366 Illinois Street  
Elberta, Alabama

GeoCon Project No. DL 3989-23

Prepared For:

Mr. Frank Boatwright  
Baldwin County Board of Education  
2600-A North Hand Avenue  
Bay Minette, Alabama 36507

Date: September 28, 2023

Prepared By:

GeoCon Engineering & Materials Testing, Inc.  
22830 McAuliffe Drive  
Robertsdale, Alabama 36567



September 28, 2023

**Baldwin County Board of Education**

2600-A North Hand Avenue  
Bay Minette, Alabama 36507

Attn: Mr. Frank Boatwright

**RE: Report of Geotechnical Exploration**

Proposed Elberta High School Additions  
13366 Illinois Street  
Elberta, Alabama  
GeoCon Project No. DL 3989-23

Dear Mr. Boatwright:

GeoCon Engineering & Materials Testing, Inc. is pleased to submit this report of geotechnical exploration for the above referenced project. Included in this report is a summary of our understanding of the project, results of the field exploration, and our recommendations for site grading and foundation design along with pavement build-up recommendations. This testing has been performed in general accordance with our signed proposal and our earlier discussions with you.

Enclosed please find our report with evaluations and recommendations followed by an Appendix which includes a Site Location Map, Test Location Plan, graphical logs of the soundings and borings, laboratory test data, a Unified Soil Classification Chart, important notes about your Geotechnical Report and the Terms and Conditions that govern our work.

We appreciate the opportunity to have provided you with our geotechnical engineering services. If you have any questions concerning this report, or if we can be of any further assistance, please contact our office.

Sincerely,

**GeoCon, Inc.**

A blue ink signature of Hayden R. Mason, written in a cursive style.

**Hayden R. Mason, E.I.**  
Staff Engineer



A blue ink signature of David R. McKee, written in a cursive style.

**David R. McKee, P.E.**  
Geotechnical Engineer

## TABLE OF CONTENTS

	<b>Page No.</b>
1.0 Project Description .....	3
2.0 Geotechnical Exploration .....	3
3.0 Soil Conditions Encountered .....	4
4.0 Groundwater Conditions Encountered.....	5
5.0 Laboratory Testing .....	5
6.0 Site Preparation Recommendations .....	5
6.1 General Site Preparation .....	5
6.2 Subgrade Preparation in Multipurpose Building “Controlled Area” .....	6
6.3 Subgrade Preparation in Bleachers/Press Box “Controlled Area” .....	7
6.4 Subgrade Preparation in Pavement “Controlled Areas” .....	8
6.5 Subgrade Preparation in Football Field “Controlled Area” .....	8
6.6 Site Drainage.....	9
6.7 Placement of Structural Fill .....	9
6.8 Weather Considerations .....	10
6.9 Unit Costs.....	10
6.10 Testing Requirements.....	10
7.0 Shallow Foundation Recommendations .....	11
8.0 Ground Floor Slabs .....	12
9.0 Pavements .....	12
9.1 Pavement Subgrade .....	12
9.2 Asphalt Pavement .....	13
10.0 Closure .....	14

## **1.0 Project Description**

The project subject to this report is the additions to the Elberta High School campus located at 13366 Illinois Street in Elberta, Alabama. The location of the subject site is shown on the attached Site Location Map (Figure 1). During our September 2023 field exploration, the areas of the proposed additions were accessible to our equipment.

The provided information indicated that the additions include one (1) new multipurpose building, one (1) set of new bleachers with a press box, improvements to the existing football field, and new related pavement areas. We anticipate that the new multipurpose building will include metal frame construction with a concrete slab-on-grade floor and be supported by shallow foundations. We understand that the proposed multipurpose building will have a footprint of about 10,700 square feet. We also understand that the proposed multipurpose building will have maximum column loads of about 75 kips and maximum wall loads of about 2½ kips per linear foot. We anticipate that the proposed new bleachers/press box will include metal frame construction and will be supported by shallow foundations. Based on the provided *Architectural Site Plan* (sheet A0.1 of *Additions to Elberta High School* drawn by McKee and Associates Architects, Inc., dated August 28, 2023), the proposed multipurpose building area will require up to about 4 to 4½ feet of fill to reach the final subgrade elevation.

Note: GeoCon should be notified of any changes to the site grading and structural loading information. Additional comments and/or revisions to this report may be required based on changes to the site grading and structural loading information. This report is intended to provide information on the soil conditions at this site and provide general recommendations and geotechnical considerations for construction.

## **2.0 Geotechnical Exploration**

Soil conditions were investigated by performing five (5) Cone Penetration Test (CPT) soundings to depths of about 1½ to 26 feet below the existing ground surface. *Please note that our original scope included extending CPT soundings to depths of about 25 feet in the proposed multipurpose building area. However, sounding C-3 encountered practical sounding refusal due to buried construction debris at a depth of about 1½ feet below the existing ground surface.* Four (4) CPT soundings were extended to depths of about 25 to 26 feet below the existing ground surface in the proposed new bleacher area. Eight (8) manual hand auger borings were extended to depths of about 4½ to 8 feet below the existing ground surface in the existing football field. In addition, five (5) manual hand auger borings were extended to depths of about 4 feet below the existing ground surface in the proposed pavement areas. The general sounding and boring locations are shown on the attached Test Location Plan (Figure 2).

CPT testing was performed in accordance with ASTM D-5778 using a Vertek S4 electronic CPT rig. CPT testing includes pushing an electronic cone on a series of rods into the ground at a constant rate. The electronic cone collects continuous measurements of the resistance to penetration of the cone tip and side friction sleeve. Correlations between Cone Resistance values and Standard Penetration Test (SPT) “N” values were performed using methods developed by Robertson, Campanella and Wightman. The CPT logs attached in the appendix show the cone tip friction, sleeve friction, pore pressure, correlated “N” value and the soil behavior type (SBT). At each test sounding location, samples were collected of the soils encountered in the upper 4 feet of the soil-profile.

The hand auger test borings performed included Dynamic Cone Penetrometer (DCP) soundings to evaluate relative soil density/consistency characteristics. With the DCP, a 1½-inch diameter cone is seated to penetrate any loose cuttings, and then driven in 1¾-inch increments with blows from a 15-pound weight falling 20 inches. The number of blows required to drive the cone the 1¾-inch increments is an index of relative soil strength and compressibility. Samples collected were visually classified by GeoCon, Inc. personnel, placed in containers and transported to our laboratory for further testing and for further review by our engineering staff. Samples will be retained at our lab for a period of 60 days after the date of this report. If no written instructions are given to GeoCon, we will discard the samples after 60 days.

### **3.0 Soil Conditions Encountered**

The soundings and borings initially encountered about 4 to 16 inches of organic topsoil material. Below the organic topsoil material, the soundings generally penetrated varying strata of silty sand, silty-clayey sand, clayey sand, and clay soils to sounding termination at depths of about 1½ to 26 feet below the existing ground surface. *Please note that sounding C-3 encountered practical auger refusal at a depth of about 1½ feet below the existing ground surface due to buried construction debris.* Below the organic topsoil material, the borings generally encountered silty sand, silty-clayey sand, clayey sand, and sandy clay soils to boring termination at depths of about 4 to 8 feet below the existing ground surface.

Based on the cone tip friction values and the correlated Standard Penetration Test values (N-values), the soils in the upper 2 to 6 feet of the soil profile were generally in a very loose to firm condition. The deeper silty sand, silty-clayey sand, and clayey sand soils were generally in a firm to dense condition. The clay soils were generally in a soft condition. Based on the DCP values, soils encountered were generally in a very loose to firm condition. A more detailed description of the soil conditions encountered is shown on the Sounding and Boring Logs in the Appendix.

#### **4.0 Groundwater Conditions Encountered**

Groundwater was encountered at eight (8) test locations at depths of about 8 to 16 feet below the existing ground surface. Perched groundwater was encountered at boring B-6 at a depth of about 5 feet below the existing ground surface. The remaining test locations did not encounter groundwater for the depths explored at the time of the field explorations. Groundwater conditions are subject to seasonal variations and are expected to fluctuate in response to local variations in precipitation and drainage conditions. Considering the relatively short time frame of the field explorations, groundwater levels may not have had sufficient time to stabilize. Therefore, actual depths to groundwater may vary.

Based on the data collected at the test locations, we do not anticipate that natural groundwater will be encountered during subgrade preparation. However, portions of the soils at this site are prone to perched groundwater conditions, especially following rain events, and should be accounted for during construction. If perched groundwater is encountered during subgrade preparation, the use of tail ditches, temporary underdrains, sumps with pumps, etc. may be required to facilitate subgrade preparation.

#### **5.0 Laboratory Testing**

The soil samples taken from the site were visually classified in general accordance with the guidelines of ASTM D-2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System). The quantity and type of laboratory tests performed for this geotechnical study were determined and adjusted by GeoCon engineering personnel based on the uniformity and characteristics of the subsurface soil conditions encountered and our experience and knowledge of local soil conditions.

Laboratory soil tests were performed to aid in the classification of the soils and to help in the evaluation of engineering characteristics of the soils. Representative soil samples recovered from the soil test locations were selected for grain-size analysis (9 tests), Atterberg Limit determination (3 tests) and moisture content determination (3 tests).

#### **6.0 Site Preparation Recommendations**

##### **6.1 General Site Preparation**

The subsurface soils encountered at this site are prone to rutting and displacing during the initial phases of site grading, especially if wet weather conditions persist during site preparation. We recommend that low ground pressure track mounted equipment be used for site preparation. The use of heavy rubber tire equipment will deteriorate the subgrade soil conditions and increase the risk for excessive rutting and displacing. Construction traffic should not be allowed on the native subgrade in the proposed multipurpose building and bleachers/press box areas and as limited as possible on the native subgrade in pavement areas.



Areas beneath and 5 feet beyond the proposed multipurpose building and bleachers/press box footprints and 2 feet beyond the pavement and football field improvement areas should be designated as the "controlled areas". The initial phase of site preparation should include the complete removal of buried debris, surface vegetation, organic topsoil, old foundation systems, utilities, etc. from within the "controlled areas". About 4 to 16 inches of organic topsoil material was encountered across the site; however, deeper cuts could be required to remove old tree stumps, root ball systems and heavy organic material.

*Please note that during our September 2023 field exploration, the area of the proposed multipurpose building and bleachers/press box included existing buildings and bleachers. We understand that these existing structures will be demolished and removed from the site. The complete removal of old foundations, buried debris, utilities, etc. is critical to the performance of the new foundations.*

*Please note that any excavations performed should not undermine existing foundations. Undercutting adjacent to the existing structures should not extend below the existing foundations. Also, we recommend that vibratory compaction techniques not be utilized within about 20 feet of the existing structures. Fill compacted within about 20 feet of the existing structures should be placed in thin lifts (maximum 6-inch loose lifts) and compacted with a static roller.*

*The owner and contractor should be aware that construction activities can potentially cause settlement of near-by structures due to vibrations (especially during undercutting and backfilling operations). Construction activities should stop immediately if excessive vibration occurs or if any damage to existing structures occurs and GeoCon and the project Structural Engineer should be contacted for evaluation and comment.*

## **6.2 Subgrade Preparation in Multipurpose Building "Controlled Area"**

The soundings in the proposed multipurpose building generally penetrated unstable soils in the upper 2 to 6 feet of the soil profile. To provide a stable and uniform subgrade, we recommend that the proposed multipurpose building "controlled area" be undercut to a depth of 2½ feet below the existing ground surface, or to a depth that allows for the placement of 18 inches of structural fill below the deepest footing elevation. Clean, non-organic silty sand soils removed during the undercut excavation can be stockpiled for use as structural fill material.

*Please note that buried construction debris was encountered at sounding C-3 at a depth of about 1½ feet below the existing ground surface. We recommend that any buried debris be removed from the building "controlled areas". Supplemental test pit excavations will be required to determine the extent of the buried debris.*

Following the recommended undercut, the exposed subgrade should be proof rolled with a half-loaded tandem axle dump truck. The proof roll and exposed subgrade should be reviewed by a GeoCon earthwork technician. Subgrade soils that are determined to be unsuitable should be reprocessed or undercut per the recommendations of the project Geotechnical Engineer. The structural fill required to reach the final subgrade elevation should meet the requirements in Section 6.7 of this report.

Areas Requiring Additional Undercut: Soundings C-2 and C-4 penetrated unstable soils to depths of about 5 to 6 feet below the existing ground surface. To provide a uniform and stable subgrade, we recommend that the areas surrounding sounding C-2 be undercut to a depth of 6 feet below the existing ground surface. In addition, we recommend that the areas surrounding sounding C-4 be undercut to a depth of 5 feet below the existing ground surface. Clean, non-organic silty sand soils removed during the undercut excavation can be stockpiled for use as structural fill material. *We also recommend that consideration be given to performing test pit excavations to determine the extent of the unstable soils. If unstable soils are not identifiable in the test pit excavations, supplemental hand auger borings and DCP soundings may be required to delineate the extent of the unstable soils.* Following the additional undercut, the exposed subgrade should be reviewed by a GeoCon earthwork technician. Subgrade soils determined to be unsuitable should be further undercut per the recommendations of the project Geotechnical Engineer. The structural fill required to reach the final subgrade elevation should meet the requirements in Section 6.7 of this report.

### **6.3 Subgrade Preparation in Bleachers/Press Box “Controlled Area”**

The soundings in the proposed bleachers/press box area generally penetrated subgrade soils that are considered unsuitable to support the proposed bleacher structure. In addition, portions of the soils were in an unstable condition in the upper 4 to 4½ feet of the soil profile. To provide a uniform and stable subgrade, we recommend that the bleachers/press box “controlled area” be undercut to a depth that allows for the placement of 18 inches of structural fill below the bottom of the deepest footing elevation. Following the recommended undercut, the exposed subgrade should be moisture conditioned and compacted to 95% ASTM D-698 standard density. The exposed subgrade should be reviewed by a GeoCon earthwork technician. Subgrade soils that fail to properly compact, or are determined to be unsuitable, should be reprocessed or undercut per the recommendations of the project Geotechnical Engineer. The structural fill required to reach the final subgrade elevation should meet the requirements in Section 6.7 of this report.

Areas Requiring Additional Undercut: Soundings C-7 and C-8 penetrated unstable soils to depths of about 4½ feet below the existing ground surface. To provide a uniform and stable subgrade, we recommend that the areas surrounding soundings C-7 and C-8 be undercut to a depth of 4½ feet below the existing ground surface. *We also recommend that consideration be given to performing test pit excavations to determine the extent of the unstable soils. If unstable soils are not identifiable in the test pit excavations, supplemental hand auger borings and DCP soundings may be required to delineate the extent of the unstable soils.* Following the additional undercut, the exposed subgrade should be reviewed by a GeoCon earthwork technician. Subgrade soils determined to be unsuitable should be further undercut per the recommendations of the project Geotechnical Engineer. The structural fill required to reach the final subgrade elevation should meet the requirements in Section 6.7 of this report.

#### 6.4 Subgrade Preparation in Pavement “Controlled Areas”

The soils encountered in the proposed pavement areas were generally in an unstable condition. These soils will not provide adequate bearing capacity to support the planned pavement build-up. To provide a stable and uniform subgrade, we recommend that the pavement “controlled areas” be undercut to a depth of 2 feet below the existing ground surface. Clean, non-organic silty sand soils removed during the undercut excavation can be stockpiled for use as structural fill material. Following the recommended undercut, the exposed subgrade should be moisture conditioned and compacted to 98% ASTM D-698 standard density. The processed subgrade should be proof rolled with a fully loaded tandem axle dump truck. The processed subgrade and proof roll should be reviewed by a GeoCon earthwork technician. Subgrade soils that fail to properly compact, or are determined to be unsuitable, should be reprocessed or undercut per the recommendations of the project Geotechnical Engineer. The structural fill required to reach the final subgrade elevation should meet the requirements in Section 6.7 of this report.

Areas Requiring Additional Undercut: Boring B-13 encountered unstable soils at a depth of about 3 feet below the existing ground surface. We recommend that areas surrounding boring B-13 be undercut to a depth of 3 feet below the existing ground surface. *We also recommend that consideration be given to performing test pit excavations to determine the extent of the unstable soils. If unstable soils are not identifiable in the test pit excavations, supplemental hand auger borings and DCP soundings may be required to delineate the extent of the unstable soils.* Following the additional undercut, the exposed subgrade should be reviewed by a GeoCon earthwork technician. Subgrade soils determined to be unsuitable should be further undercut per the recommendations of the project Geotechnical Engineer. The initial lift of structural fill placed in the areas of additional undercut surrounding boring B-13 should consist of “select sand” (see Section 6.7 of this report). Additional fill required above the “select sand” to reach final subgrade elevations should consist of structural fill and meet the requirements in Section 6.7 of this report.

#### 6.5 Subgrade Preparation in Football Field “Controlled Area”

The borings in the area of the proposed football field improvements generally encountered silty sand, silty-clayey sand, clayey sand, and sandy clay soils. These soils are considered to have moderate to poor drainage characteristics. To provide a free-draining and stable subgrade for the field, we recommend that the football field “controlled area” be undercut to a depth that would allow for placement of 24 inches of “select sand” fill (see Section 6.7 of this report) below the turf surface. In addition, we recommend that an underdrain system be installed to provide positive drainage. Please note that care should be exercised in areas of existing underground utilities (i.e. – irrigation lines, underdrains, etc.). Following the recommended undercut, the exposed subgrade should be reviewed by a GeoCon earthwork technician. The “select sand” fill should meet the requirements in Section 6.7 of this report.

## 6.6 Site Drainage

The "controlled areas" should be maintained in a well-drained condition that will promote the continual removal of surface water that may flow over the construction areas. This positive drainage is critical for the subgrade soils that predominate the site. Saturation of these soils can result in substantial time delays in the construction and significant decreases in soil strength. During construction (both site grading and building), the contractor should exercise caution during inclement weather to ensure the subgrade and structural fill courses are not degraded by construction traffic. Water should not be allowed to pond against the building or bleachers/press box during and following construction. Ponding water adjacent to the building and bleachers/press box foundations could lead to settlement due to deterioration of the foundation bearing soils.

## 6.7 Placement of Structural Fill

Select sand fill, where required (see Section 6.4), should exhibit less than 50% passing the No. 50 sieve and less than 10% passing the No. 200 sieve (fines). The initial layer of select sand fill is to "bridge" over the moisture sensitive subgrade soils. It would be important to "cap" the sand layer off with a quality structural fill material to help limit surface water intrusion into the fill layers. The initial lift of fill should be placed in an 18-inch-thick loose lift and compacted to 95% ASTM D-698 standard density by "tracking" the material in with low ground pressure tracked equipment (to prevent pumping of the underlying cohesive material). Select sand fill should also be used in areas where perched groundwater seepage is encountered. The select sand fill should extend at least 12 inches above any perched groundwater seepage. Select sand fill above the initial 18-inch lift should be placed in 8-inch lifts and compacted to 98% ASTM D-698 standard density.

Structural fill required to achieve final subgrade elevations should be placed in 8-inch loose lifts and compacted to 98% ASTM D-698 standard density. Structural fill should be placed at moisture contents within +/- 3% of the material's optimal moisture content. Once the surface of each lift of structural fill is ready for the next lift, the exposed soil should be maintained at the placed moisture content until the next lift of fill is placed. Structural fill should originate from an approved off-site borrow source should meet the city and/or county color requirements and the following minimum requirements:

- 1) Exhibit SM or SC classification according to the Unified Soil Classification System
- 2) Have a minimum of 20% to maximum of 35% soil fines passing the No. 200 sieve
- 3) Have a maximum Liquid Limit (LL) of 20
- 4) Have a Plasticity Index (PI) less than 8
- 5) Have a minimum standard Proctor (ASTM D-698) maximum dry density of 110 pcf

### Football Field “Controlled Areas”:

Select sand fill placed in the football field “controlled area” should exhibit less than 50% passing the No. 50 sieve and less than 10% passing the No. 200 sieve (fines). The select sand fill should be placed in 8-inch loose lifts and compacted to 95% ASTM D-698 standard compaction. The select sand should be placed at moisture contents within +/- 3% of the material’s optimal moisture content. Once the surface of each lift of structural fill is ready for the next lift, the exposed soil should be maintained at the placed moisture content until the next lift of fill is placed.

## **6.8 Weather Considerations**

Weather conditions at the time of site preparation will directly impact earthmoving activities. Exposed subgrade soils and structural fill soils can be expected to degrade during wet weather conditions. Additional soil processing and drying efforts are typically required during wet weather conditions.

## **6.9 Unit Costs**

Soils are not uniform in nature and variations in soil conditions should be expected. Also, weather prior to and during site grading has a direct effect on subgrade soil conditions and the amount of processing or undercut required to provide a stable subgrade. Therefore, we recommend that the contract documents establish a unit cost (per cubic yard) for undercutting and replacing unsuitable soils. We also recommend that a unit cost be established for the installation of typical underdrains (per linear foot), if required.

## **6.10 Testing Requirements**

The geotechnical consultant should monitor and document the results of the topsoil stripping, debris removal, subgrade proof-rolling, correction of weak soil conditions and the conditions of the final subgrades, foundation construction, and floor slab bearing soils.

During fill placement, field density testing should be performed to confirm that the specified compaction criteria are being achieved. As a general guide, we recommend that at least four (4) density tests be performed for each lift of fill in the proposed building and bleachers/press box “controlled areas”. We recommend that five (5) density tests be performed for each lift of fill in the football field “controlled area”. In addition, we recommend at least one (1) compaction test be performed for each lift of fill per 5,000 square feet in the pavement “controlled areas”. Sufficient samples of on-site soils should be collected for Proctor compaction tests to provide the moisture-density relationships needed for compaction control. Sufficient samples of structural fill materials should be submitted by the contractor for classification and Proctor density tests to show substantial compliance with the specifications and to provide the moisture-density relationships needed for compaction control. It is important that proper quality assurance testing be performed during site grading.

A minimum of one (1) field density test should be performed per each 150 linear feet (per each 2 ft. of vertical thickness) of fill placed at utility trenches extending through the "controlled areas". Current OSHA regulations should be followed with respect to excavations for this project. Heavy construction traffic and stockpiling of excavated earth should not be permitted near the top of open unsupported excavations.

*Please note that following proper compaction and testing, the subgrade soils should be protected from disturbance. If compacted subgrade soils are left exposed for more than 72 hours or if exposed to inclement weather conditions, freeze/thaw cycles, etc., the exposed subgrade soils should be re-tested to determine if the subgrade meets the recommended moisture condition and compaction criteria.*

### **7.0 Shallow Foundation Recommendations**

Provided the proposed building and bleachers/press box "controlled areas" are prepared in accordance with this report, the proposed structures can be supported by typical reinforced concrete spread foundations. Foundations can be designed using a net allowable soil bearing pressure up to 2,000 psf. The allowable soil bearing pressure applies to dead loads plus design live loads. The allowable soil bearing pressure may be increased by one-third when considering total loads that include transient loads such as wind and seismic. Perimeter wall foundations should bear at a minimum depth of 18 inches below finished subgrade levels. The bottom of interior foundations (if any) should bear at a minimum depth of 12 inches below the top of the concrete floor slabs. The bottom of all foundation footings should be compacted to at least 95% standard Proctor density prior to reinforcing steel (rebar) and concrete placement.

*Again, please note that caution should be used when excavating footings adjacent to the existing structures to limit the potential for undermining. If the existing foundations are undermined during the footing excavations, GeoCon should be notified to provide additional comments.*

Lateral and uplift loads can be resisted by passive pressure of the soil acting against the side of the individual footings and/or the friction developed between the base of the footings and the underlying soils. For compacted backfill and firm native soils, the passive pressure may be taken as the equivalent to the pressure exerted by a fluid weighing 350 pounds per cubic foot (pcf). A coefficient of friction equal to 0.32 may be used for calculating the frictional resistance at the base of spread footings. These lateral resistance values are based on the assumption that the foundations can withstand horizontal movements on the order of ¼ inch. Spread foundation depths can be increased for uplift resistance as required. A soil unit weight of 105 pcf can be used for backfill atop foundations.



Soils exposed in the bottom of all satisfactory excavations should be protected against disturbance, excessive drying, freezing or rain. Surface runoff should be drained away from excavations and not allowed to pond. The saturation of soils at the footing bearing elevation level can reduce their strength and load carrying ability. Concrete for foundations should be placed as soon after completion of the excavations as possible. If a delay in concrete placement is expected or if exposed to wet weather, the footings will require being undercut by a minimum depth of 12 inches below the planned bottom of footing excavation. The resulting excavation should be replaced with a clean open-graded crushed aggregate (similar to No. 57 or 67 stone). The initial 6 inches of stone should be "choked" into the subgrade soils. The remaining stone should be placed in 6-inch lifts and be seated in-place with a mechanical compactor.

The "frost penetration" depth in the areas of this project is generally taken to be less than 10 inches. Provided our recommendations for the development of the foundations, floor slabs and pavements are followed, we do not expect that the "frost penetration" will have any detrimental effects on the performance of the foundations, floor slabs or pavements.

### **8.0 Ground Floor Slabs**

The subgrade soil beneath all ground supported floor slabs should be prepared per the recommendations provided in section 6.0 of this report. Prior to installation of the floor slabs, a 10-mil plastic vapor barrier, at minimum, should be installed over the subgrade. The vapor barrier should be placed as soon as possible after subgrade preparation. In addition, the plastic vapor barrier should be properly lapped, and all joints and intrusions properly taped and sealed. Special attention should be given to properly compacting utility trenches in the building areas. Utility trenches below the slab areas should be compacted to 95% ASTM D-698 standard density.

If moisture sensitive floor coverings are to be used or if interior slab moisture is critical, we recommend that a porous drainage layer (min. 4 inch) also be placed below the slabs. A clean, free-draining coarse sand should prove satisfactory for the drainage layer. We recommend that the drainage layer material exhibit no more than 50% passing the No. 50 sieve and no more than 5% passing the No. 200 sieve.

### **9.0 Pavements**

#### **9.1 Pavement Subgrade**

We anticipate that the proposed pavement areas will be subject to a low volume of passenger vehicles. However, we also anticipate that the access drive will be required to support a 75,000-pound firetruck. Therefore, we recommend that the proposed access drive include a medium-duty pavement buildup. The scope of this investigation did not include laboratory CBR testing for pavement design. Pavement design has been based on an estimated CBR value of 8 for the structural fill soils.

The recommendations in the Site Preparation Recommendations section of this report should be followed in the pavement areas. Prior to base placement, subgrade improvements should also include thoroughly mixing the top 6 inches of exposed soil throughout and 3 feet beyond the pavement areas to form a relatively uniform layer. This mixed soil layer should be compacted to at least 100% ASTM D-698 standard density. Drainage improvements at subgrade levels should include slopes, 2% minimum, which are designed to discharge water (which may tend to pond over the subgrade) toward low collection points which are provided with positive relief to side drainage ditches or buried storm drainage. Areas which exhibit unsuitable materials, or which fail to compact properly should be corrected as per the geotechnical consultant's recommendations.

## 9.2 Asphalt Pavement

The following light-duty pavement build-up could be used in areas subject to a low volume of passenger vehicles:

### Light-Duty Asphalt Pavement Section

- 2" ALDOT Section 424A, Bituminous Wearing Surface  
(220 lb/sy – ½ inch max aggregate size mix)
- 6" ALDOT Section 825 Crushed Aggregate Base Material (100% standard density)
- 24" Compacted Structural Fill (top 6 inches compacted to 100% standard density)

The following medium-duty pavement build-up should be used in the access drive and other areas subject to school bus and firetruck traffic:

### Medium-Duty Asphalt Pavement Section

- 1" ALDOT Section 424A, Bituminous Wearing Surface  
(110 lb/sy – ¾ inch max aggregate size mix)
- ALDOT Section 405 Tack Coat
- 2" ALDOT Section 424B, Bituminous Binder  
(220 lb/sy – ½ inch max aggregate size mix)
- 6" ALDOT Section 825 Crushed Aggregate Base Material  
(100% standard density)
- 24" Compacted Structural Fill (top 6 inches compacted to 100% standard density)

Provided the moisture content of the base layer is at or within 2% above the base material's optimal moisture content at the time of paving, a prime coat over the base is not required. Periodic maintenance should be performed on the pavement sections to help pro-long the pavement's lifespan.



A quality crushed concrete material that meets the gradation requirements of ALDOT Section 825 Crushed Aggregate Base could be used. An option to the use of a crushed aggregate base would be the use of a granular base that meets the requirements of ALDOT Section 821. Please note that in order to achieve an equivalent structural number, the base layer would have to be increased to 12 inches in thickness.

### **10.0 Closure**

This report has been prepared for the exclusive use of the Baldwin County Board of Education and their project design professionals for specific application to the above referenced project in accordance with generally accepted current standards of geotechnical engineering practice common to the local area.

The comments and recommendations of this report provide manageable and reasonable solutions to the advancement of the project based on the collected test data and the provided design information. Significant changes in site conditions or project design may result in alternative solutions to the design required or may permit more manageable and economical construction techniques. Should such significant changes occur, we will be available to offer supplemental comments.

The comments and recommendations of this report are based upon our interpretation of the information supplied by the client, the data collected at the nine (9) CPT soundings, thirteen (13) hand auger borings, and the site conditions observed at the time of testing. A significant amount of interpolation was necessary. Because it is not possible to know or predict detailed conditions hidden beneath the ground surface, our comments and recommendations are presented as opinions and judgements, as opposed to statements of fact.

Improper site preparation, extremes in climatic conditions, significant changes in grade, time, etc., can affect the groundwater, surface, and subsurface conditions. If conditions are encountered as the construction advances which vary significantly from those described by this report, we should be contacted for additional comment.

We have not intended to reflect specific volumes of subsurface conditions at the site. Volumetric estimates often require a large number of borings placed on a close grid with the collected data associated with civil engineering cross-sections. If volume estimates are required of us for the design/development of this project to advance, please contact us for further comment.

Again, we appreciate the opportunity to provide our geotechnical engineering services for this project. We recommend that the owner retain GeoCon, Inc. to provide construction observation and construction materials testing for the project.

# **APPENDIX**

- A-1 Site Location Map
- A-2 Test Location Plan
- A-3 Graphical Logs of the Soundings and Borings
- A-4 Laboratory Test Data
- A-5 Unified Soil Classification Chart
- A-6 Important Notes About Your Geotechnical Report
- A-7 Terms & Conditions Sheet



Figure 1

NOT TO SCALE  
**SITE LOCATION MAP**  
 Proposed Elberta High School Additions  
 13366 Illinois Street  
 Elberta, AL  
 DL 3989-23

**GEOCON, INC.**  
 22830 McAuliffe Drive  
 Robertsedale, Alabama 36567

Date  
 9/15/2023



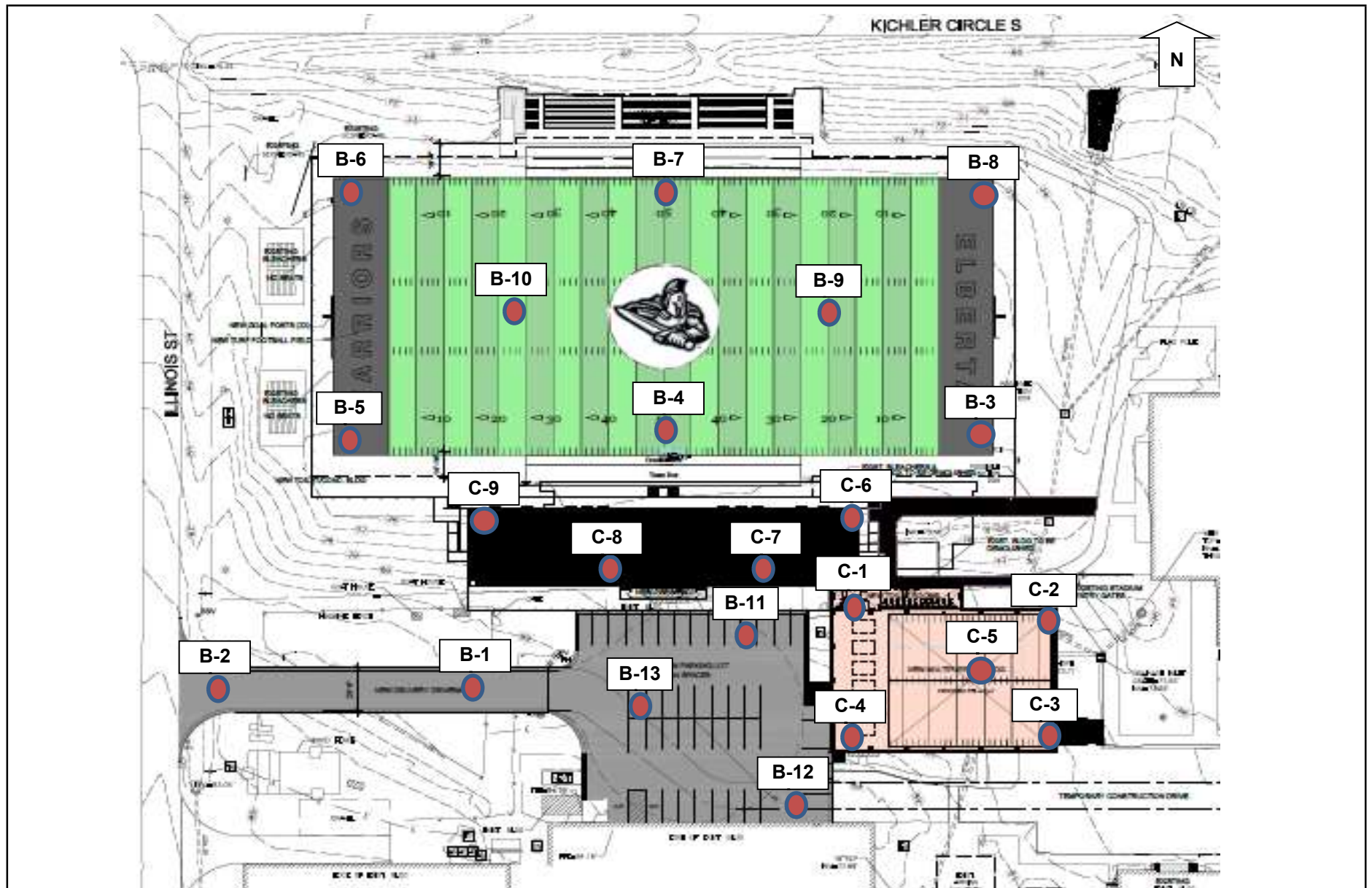
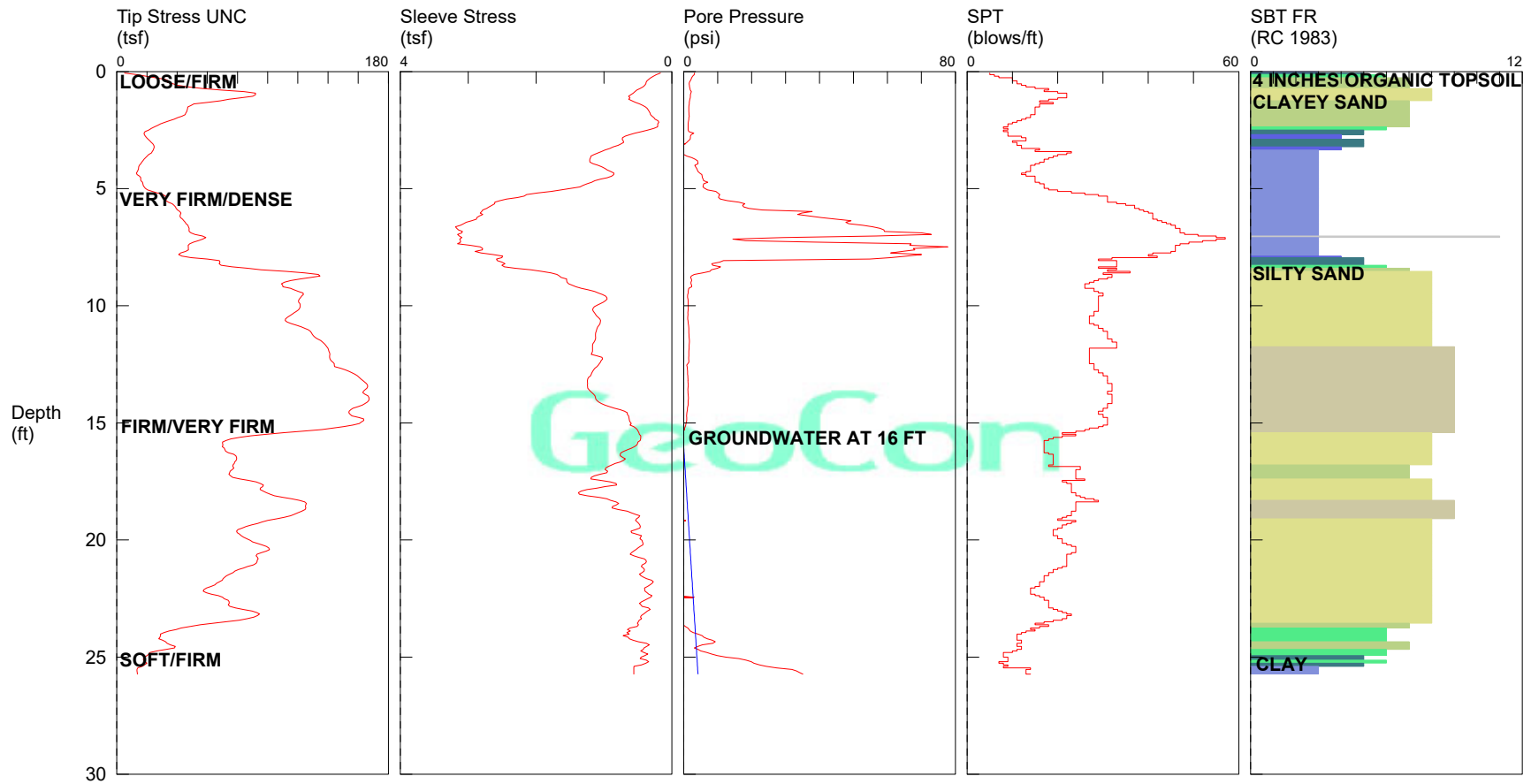


Figure 2	<p>NOT TO SCALE</p> <p><b>TEST LOCATION PLAN</b></p> <p>Proposed Elberta High School Additions</p> <p>13366 Illinois Street</p> <p>Elberta, AL</p> <p>DL 3989-23</p>	<p><b>GEOCON, INC.</b></p> <p>22830 McAuliffe Drive</p> <p>Robertsdale, AL 36567</p>
Date 9/15/2023		

# C-1

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-1

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2350N,08736.0010W,8.4



1 sensitive fine grained  
 2 organic material  
 3 clay  
 \*SBT/SPT CORRELATION: UBC-1983

4 silty clay to clay  
 5 clayey silt to silty clay  
 6 sandy silt to clayey silt

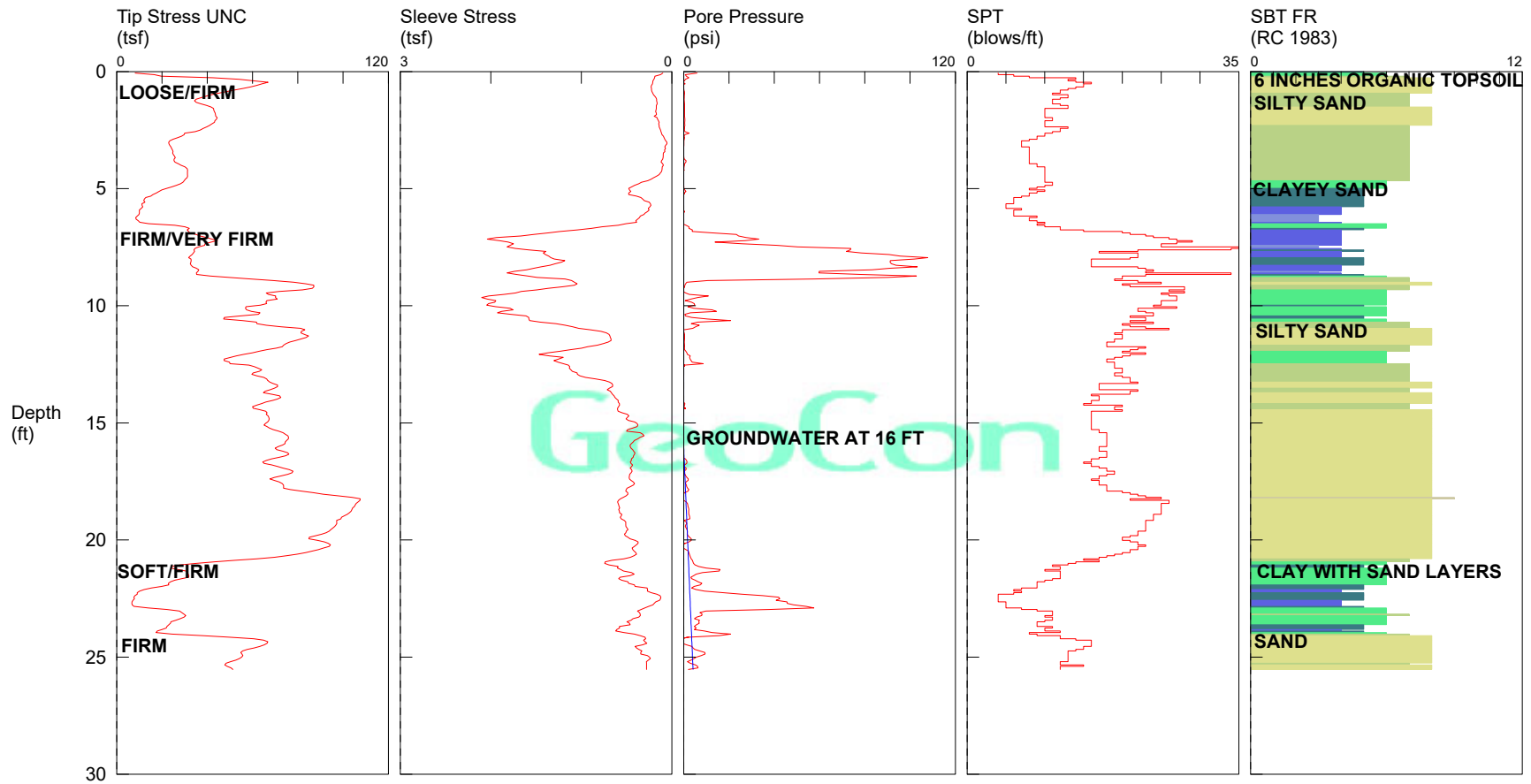
7 silty sand to sandy silt  
 8 sand to silty sand  
 9 sand

10 gravelly sand to sand  
 11 very stiff fine grained (\*)  
 12 sand to clayey sand (\*)

## C-2

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-2

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2360N,08735.9800W,20.7



- 1 sensitive fine grained
- 2 organic material
- 3 clay

- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt

- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand

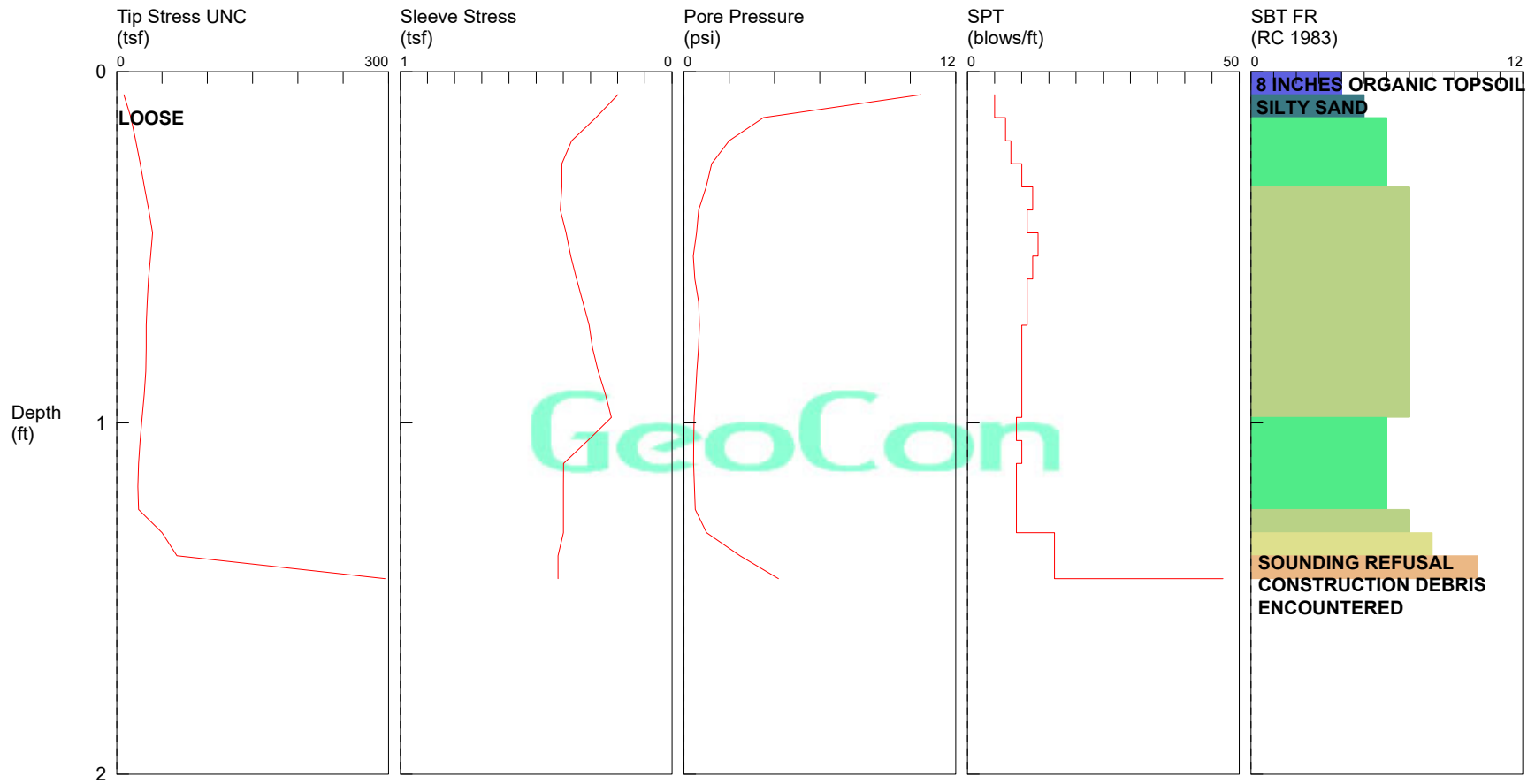
- 10 gravelly sand to sand
- 11 very stiff fine grained (\*)
- 12 sand to clayey sand (\*)

\*SBT/SPT CORRELATION: UBC-1983

## C-3

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-3

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2240N,08735.9800W,26.9



1 sensitive fine grained  
 2 organic material  
 3 clay  
 \*SBT/SPT CORRELATION: UBC-1983

4 silty clay to clay  
 5 clayey silt to silty clay  
 6 sandy silt to clayey silt

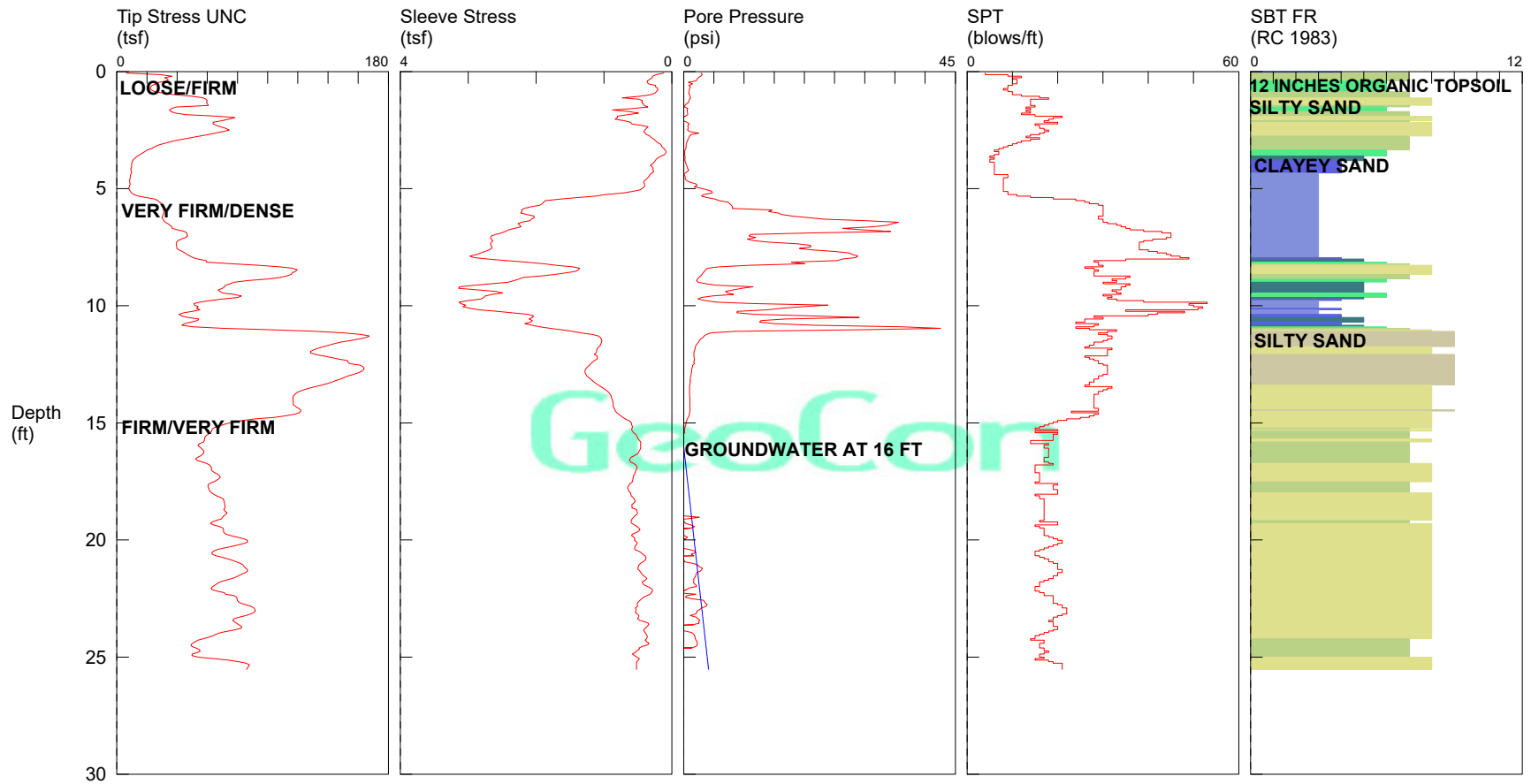
7 silty sand to sandy silt  
 8 sand to silty sand  
 9 sand

10 gravelly sand to sand  
 11 very stiff fine grained (\*)  
 12 sand to clayey sand (\*)

# C-4

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-4

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2240N,08736.0010W,11.8



- 1 sensitive fine grained
- 2 organic material
- 3 clay

- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt

- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand

- 10 gravelly sand to sand
- 11 very stiff fine grained (\*)
- 12 sand to clayey sand (\*)

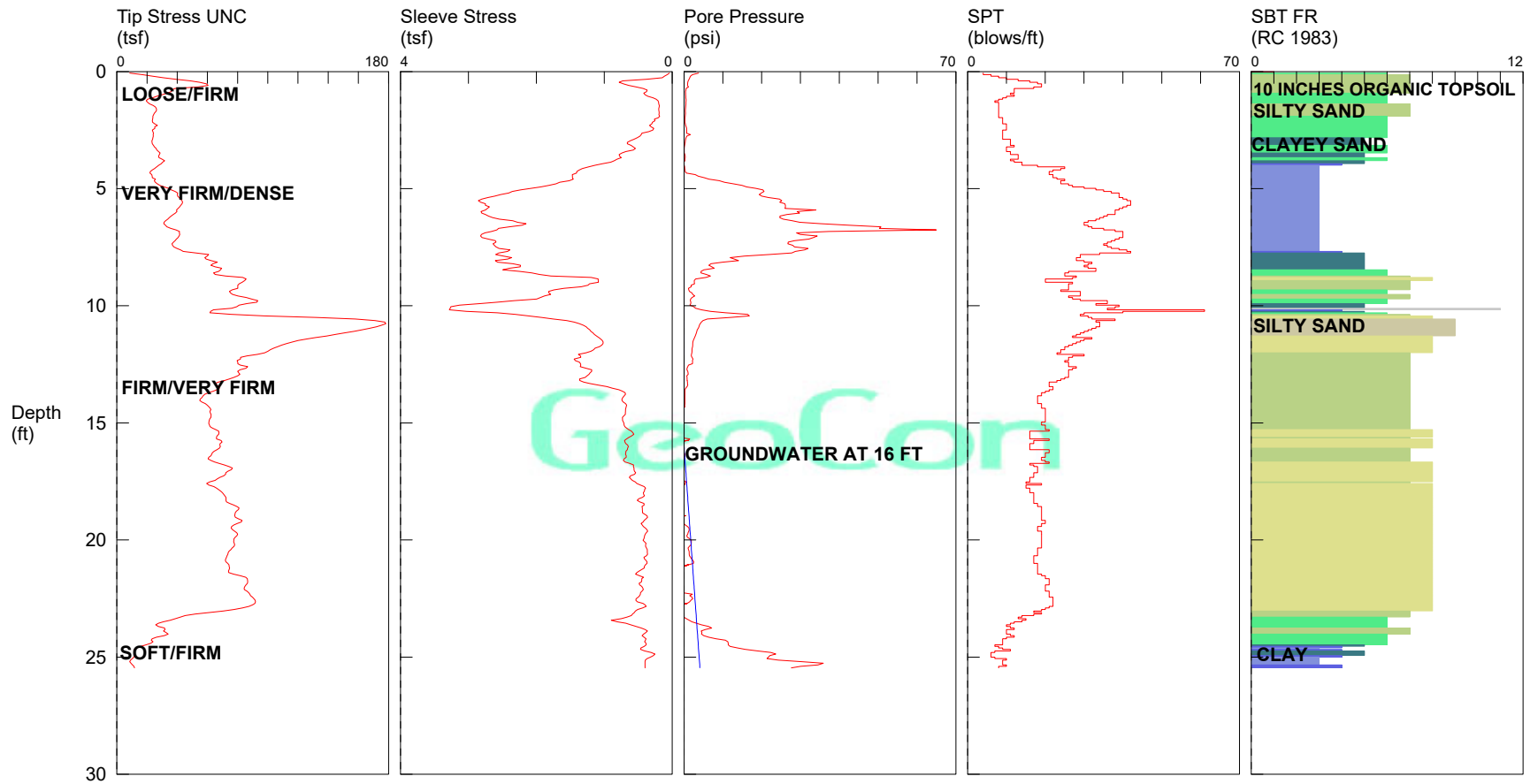
\*SBT/SPT CORRELATION: UBC-1983



# C-5

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-5

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2300N,08735.9890W,15.1



1 sensitive fine grained  
 2 organic material  
 3 clay  
 \*SBT/SPT CORRELATION: UBC-1983

4 silty clay to clay  
 5 clayey silt to silty clay  
 6 sandy silt to clayey silt

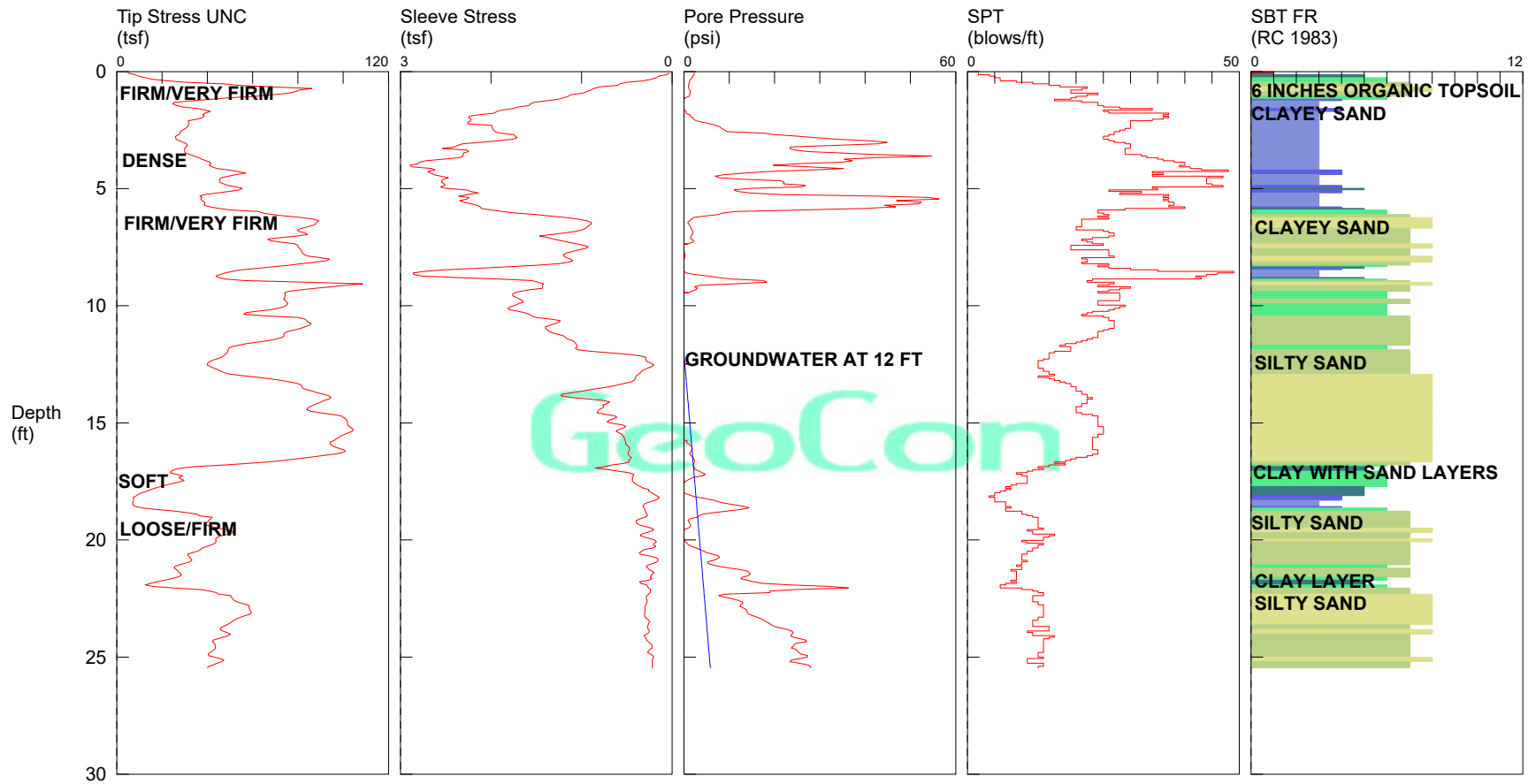
7 silty sand to sandy silt  
 8 sand to silty sand  
 9 sand

10 gravelly sand to sand  
 11 very stiff fine grained (\*)  
 12 sand to clayey sand (\*)

## C-6

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-6

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2400N,08736.0010W,23.2



- 1 sensitive fine grained
- 2 organic material
- 3 clay

- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt

- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand

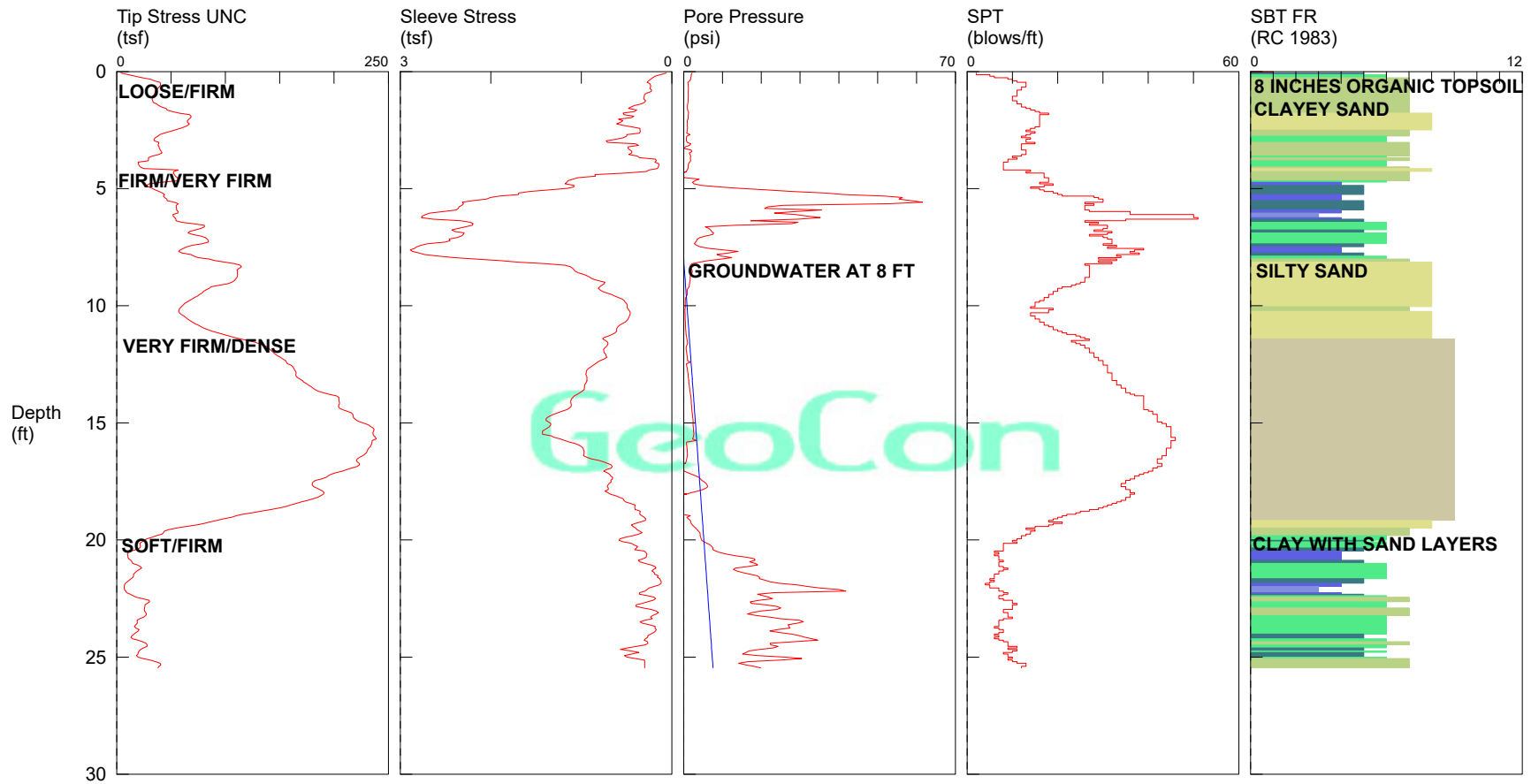
- 10 gravelly sand to sand
- 11 very stiff fine grained (\*)
- 12 sand to clayey sand (\*)

\*SBT/SPT CORRELATION: UBC-1983

# C-7

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-7

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2460N,08736.0000W,23.2



- 1 sensitive fine grained
- 2 organic material
- 3 clay

- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt

- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand

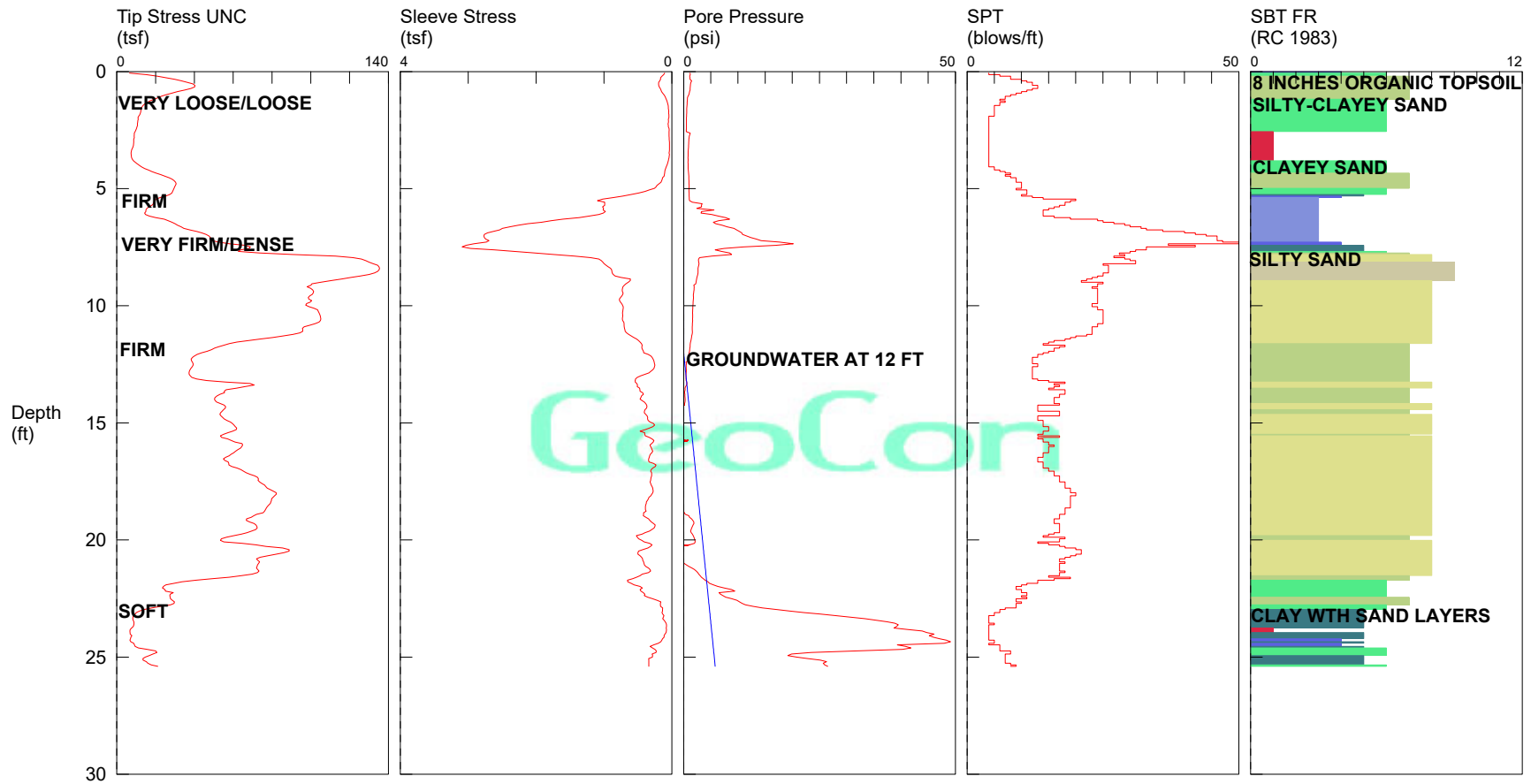
- 10 gravelly sand to sand
- 11 very stiff fine grained (\*)
- 12 sand to clayey sand (\*)

\*SBT/SPT CORRELATION: UBC-1983

# C-8

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-8

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2410N,08736.0260W,26.4



- 1 sensitive fine grained
- 2 organic material
- 3 clay

- 4 silty clay to clay
- 5 clayey silt to silty clay
- 6 sandy silt to clayey silt

- 7 silty sand to sandy silt
- 8 sand to silty sand
- 9 sand

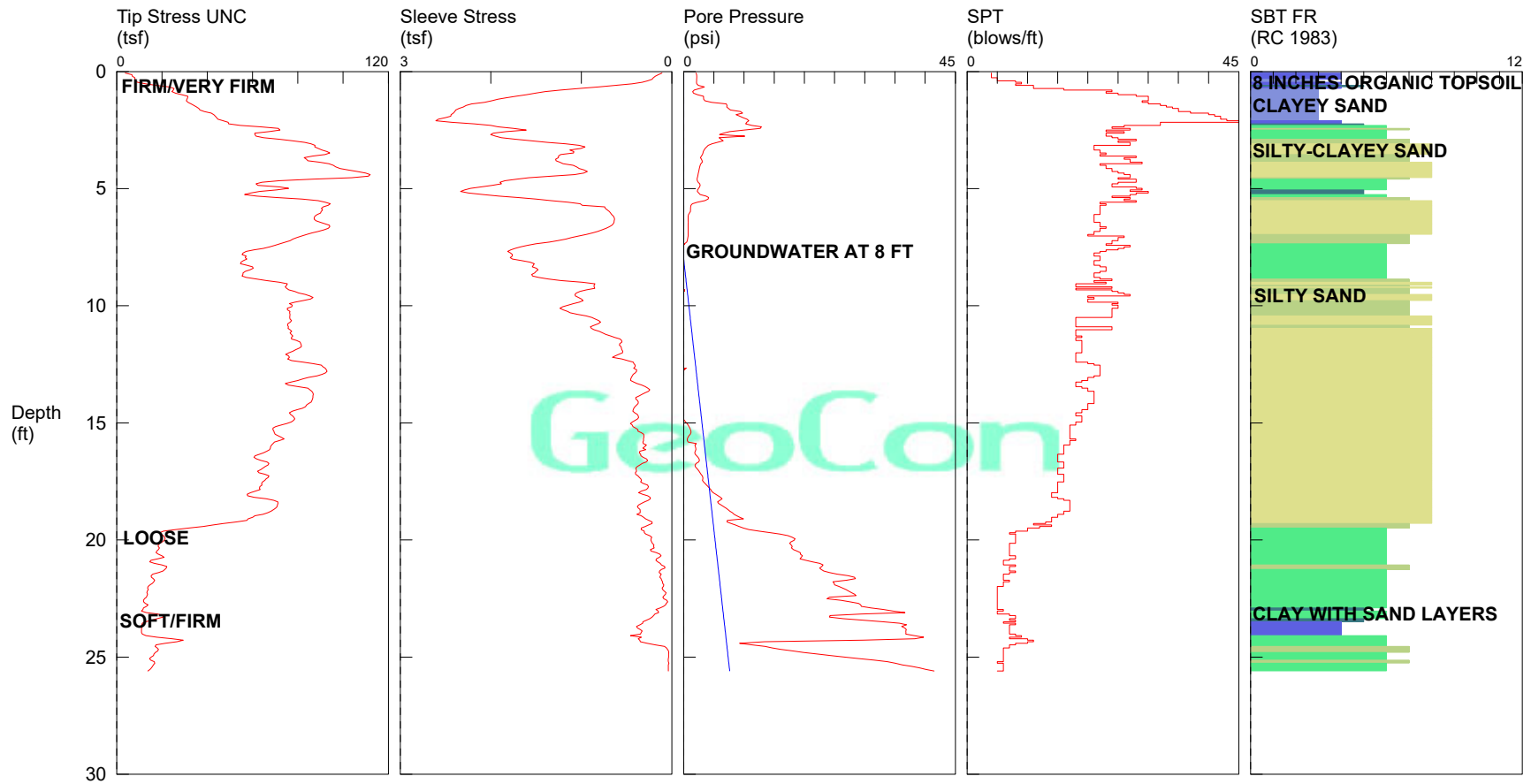
- 10 gravelly sand to sand
- 11 very stiff fine grained (\*)
- 12 sand to clayey sand (\*)

\*SBT/SPT CORRELATION: UBC-1983

# C-9

CPT Testing Done By : GeoCon  
 Proposed : Elberta High School Additions  
 CUSTOMER: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 HOLE NUMBER: C-9

JOB NUMBER: DL 3989-23  
 TEST DATE: 9/14/2023  
 OPERATOR: Bryant Volovecky  
 GPS (LAT,LON,ALT): 3025.2450N,08736.0390W,22.7



- |                          |                             |                            |                                |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay        | 7 silty sand to sandy silt | 10 gravelly sand to sand       |
| 2 organic material       | 5 clayey silt to silty clay | 8 sand to silty sand       | 11 very stiff fine grained (*) |
| 3 clay                   | 6 sandy silt to clayey silt | 9 sand                     | 12 sand to clayey sand (*)     |

\*SBT/SPT CORRELATION: UBC-1983

# DRILL HOLE LOG

BORING NO.: B-1

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 9/18/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0				6 Inches Organic Topsoil					10 30 50
1									
2			SM	Tan Silty Sand, Firm				10	
3				Very Loose				2	
4				Boring Terminated at 4 ft					
5									
6									
7									

"N Value" Equal to DCP Soundings

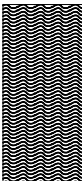
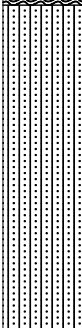
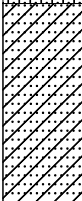
This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

## BORING NO.: B-2

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 9/18/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				10 Inches Organic Topsoil					
1			SM	Tan Silty Sand, Very Loose				1	
2									
3			SC	Tan Clayey Sand, Very Loose				2	
4				Boring Terminated at 4 ft					
5									
6									
7									

"N Value" Equal to DCP Soundings

This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

BORING NO.: B-3

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 7/6/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0				8 Inches Organic Topsoil					10 30 50
1			SM	Tan Silty Sand, Loose				7	
2									
3				Firm				10	
4									
5			SC	Tan, Orange Clayey Sand					
6				Boring Terminated at 6 ft					
7									

"N Value" Equal to DCP Soundings

This information pertains only to this boring and should not be interpreted as being indicative of the site.


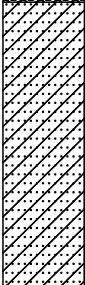

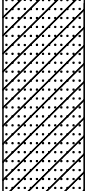



# DRILL HOLE LOG

## BORING NO.: B-4

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 7/6/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				16 Inches Organic Topsoil					
1			SC	Tan, Orange Clayey Sand, Loose				4	
2									
3			CL	Tan Sandy Clay				7	
4									
5									
6				Boring Terminated at 6 ft					
7									

"N Value" Equal to DCP Soundings


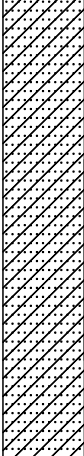


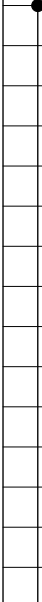
This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

BORING NO.: B-5

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 7/6/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				8 Inches Organic Topsoil					
1			SC	Tan Clayey Sand, Loose				8	
2									
3			SC-SM	Orange, Tan Silty-Clayey Sand, Firm				10	
4									
5									
6				Boring Terminated at 6 ft					
7									

"N Value" Equal to DCP Soundings

This information pertains only to this boring and should not be interpreted as being indicative of the site.

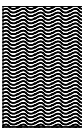


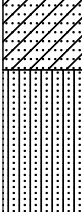


# DRILL HOLE LOG

BORING NO.: B-6

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : 5

PROJECT NO.: DL 3989-23  
 DATE: 7/6/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

AT COMPLETION  $\nabla$  :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				10 Inches Organic Topsoil					
1.5			SC	Tan Clayey Sand, Firm				10	
3			SM	Tan, Gray Silty Sand, Firm				10	
4.5				Very Loose Perched Groundwater at 5 ft				WOH	
6									
7.5									
9				Auger Refusal due to Hole Caving Boring Terminated at 8 ft					
10.5									

"N Value" Equal to DCP Soundings


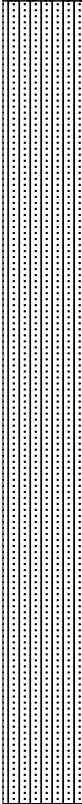

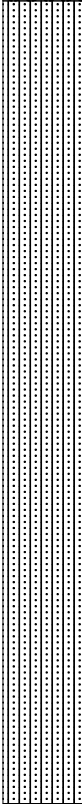
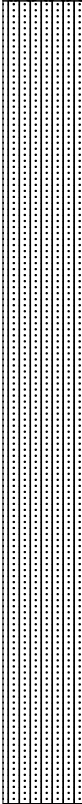

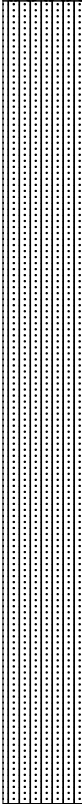
This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

## BORING NO.: B-7

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 7/6/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				6 Inches Organic Topsoil					
1			SM	Orange Silty Sand, Firm				12	
2									
3			SM	Gray Silty Sand, Firm				11	
4									
5				Auger Refusal due to Hole Caving Boring Terminated at 4.5 ft					
6									
7									

"N Value" Equal to DCP Soundings

This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

BORING NO.: B-8

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 7/6/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				4 Inches Organic Topsoil					
1									
2			SC-SM	Orange Silty-Clayey Sand, Firm				11	
3			SM	Gray Silty Sand, Firm				13	
4									
5									
6				Boring Terminated at 6 ft					
7									

"N Value" Equal to DCP Soundings

This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

BORING NO.: B-9

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 7/6/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				4 Inches Organic Topsoil					
1									
2			SC-SM	Orange Silty-Clayey Sand, Firm				14	
3			SM	Gray Silty Sand, Firm				10	
4									
5				Auger Refusal due to Hole Caving Boring Terminated at 4.5 ft					
6									
7									

"N Value" Equal to DCP Soundings


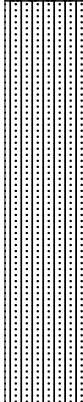

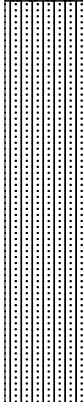
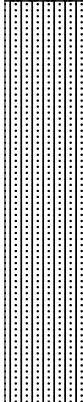

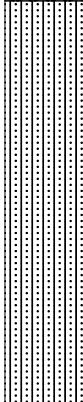
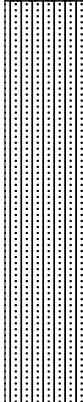
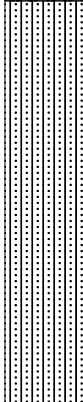
This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

## BORING NO.: B-10

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 7/6/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				6 Inches Organic Topsoil					
1			SM	Dark Tan Silty Sand, Loose				8	
2									
3			SM	Tan Silty Sand, Firm				11	
4									
5									
6				Boring Terminated at 6 ft					
7									

"N Value" Equal to DCP Soundings

This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

## BORING NO.: B-11

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 9/18/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0				6 Inches Organic Topsoil					10 30 50
1									
2			SC-SM	Tan Silty-Clayey Sand, Firm				11	
3			SC	Tan Clayey Sand, Loose				4	
4				Boring Terminated at 4 ft					
5									
6									
7									

"N Value" Equal to DCP Soundings

This information pertains only to this boring and should not be interpreted as being indicative of the site.


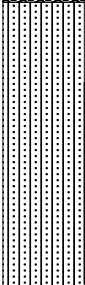

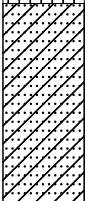



# DRILL HOLE LOG

## BORING NO.: B-12

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

PROJECT NO.: DL 3989-23  
 DATE: 9/18/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				16 Inches Organic Topsoil					
1			SM	Gray, Tan Silty Sand, Very Loose				2	
2									
3			SC	Tan Clayey Sand, Very Loose				2	
4				Boring Terminated at 4 ft					
5									
6									
7									

"N Value" Equal to DCP Soundings






This information pertains only to this boring and should not be interpreted as being indicative of the site.

# DRILL HOLE LOG

## BORING NO.: B-13

PROJECT: Proposed Elberta High School Additions  
 CLIENT: Baldwin County Board of Education  
 LOCATION: Elberta, AL  
 DRILLER: Mason Taylor  
 DRILL RIG:  
 DEPTH TO WATER> INITIAL  $\nabla$  : AT COMPLETION  $\nabla$  :

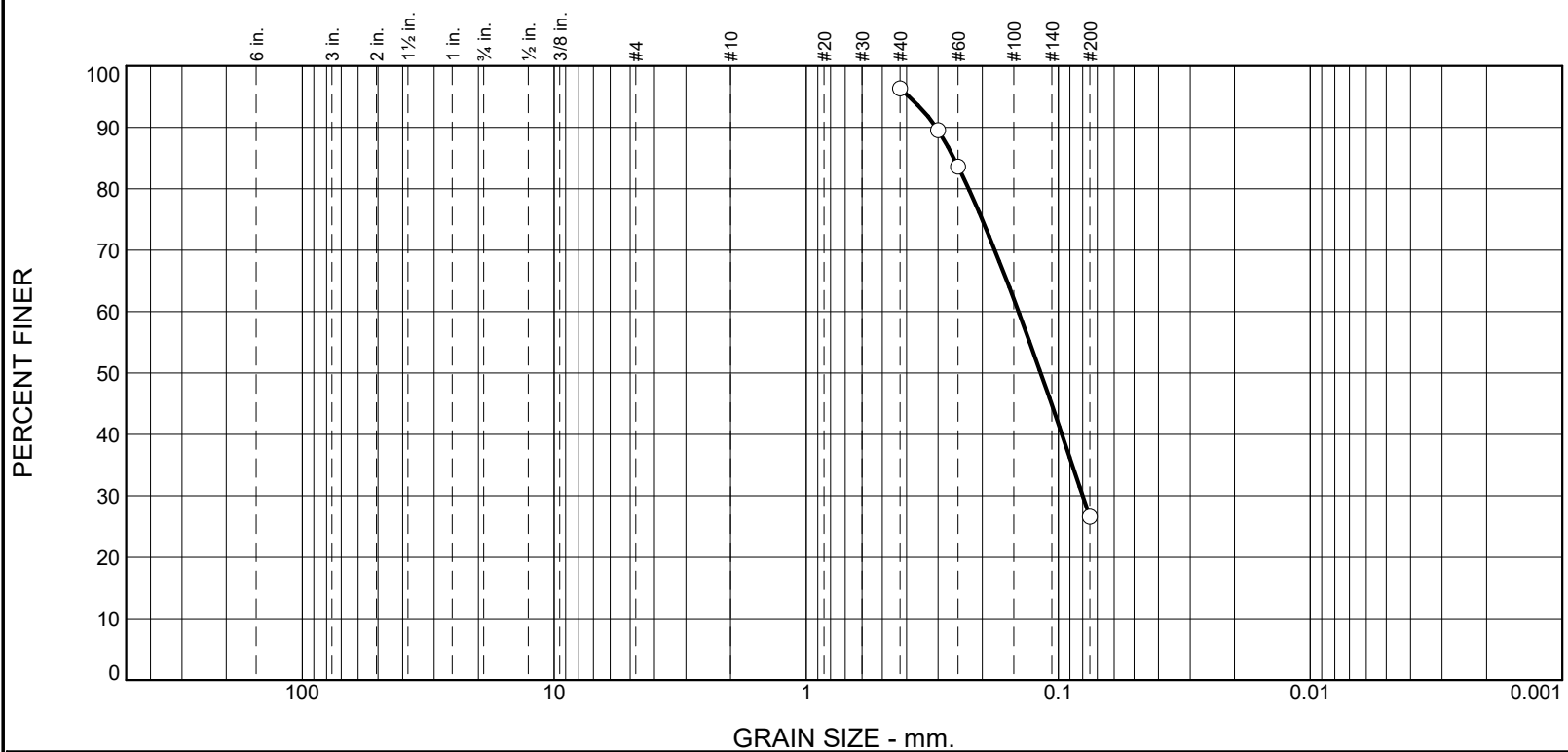
PROJECT NO.: DL 3989-23  
 DATE: 9/18/2023  
 ELEVATION:  
 LOGGED BY: Chris Rea

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
									10 30 50
0				10 Inches Organic Topsoil					
1			SC	Tan Clayey Sand, Very Loose				2	
2									
3								WOH	
4				Boring Terminated at 4 ft					
5									
6									
7									

"N Value" Equal to DCP Soundings

This information pertains only to this boring and should not be interpreted as being indicative of the site.

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
					69.7	26.6	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	96.3		
#50	89.5		
#60	83.6		
#200	26.6		

\* (no specification provided)

<b>Material Description</b>		
Brown Silty Sand		
<b>Atterberg Limits (ASTM D 4318)</b>		
PL=	LL=	PI=
<b>Classification</b>		
USCS (D 2487)=	SM	AASHTO (M 145)=
<b>Coefficients</b>		
D <sub>90</sub> = 0.3052	D <sub>85</sub> = 0.2598	D <sub>60</sub> = 0.1438
D <sub>50</sub> = 0.1174	D <sub>30</sub> = 0.0799	D <sub>15</sub> =
D <sub>10</sub> =	C <sub>u</sub> =	C <sub>c</sub> =
Remarks		
Date Received: _____ Date Tested: 9/25/2023		
Tested By: HM		
Checked By: DM		
Title: _____		

Location: Elberta, AL  
Sample Number: C-2 Depth: 2 ft.

Date Sampled:

GeoCon

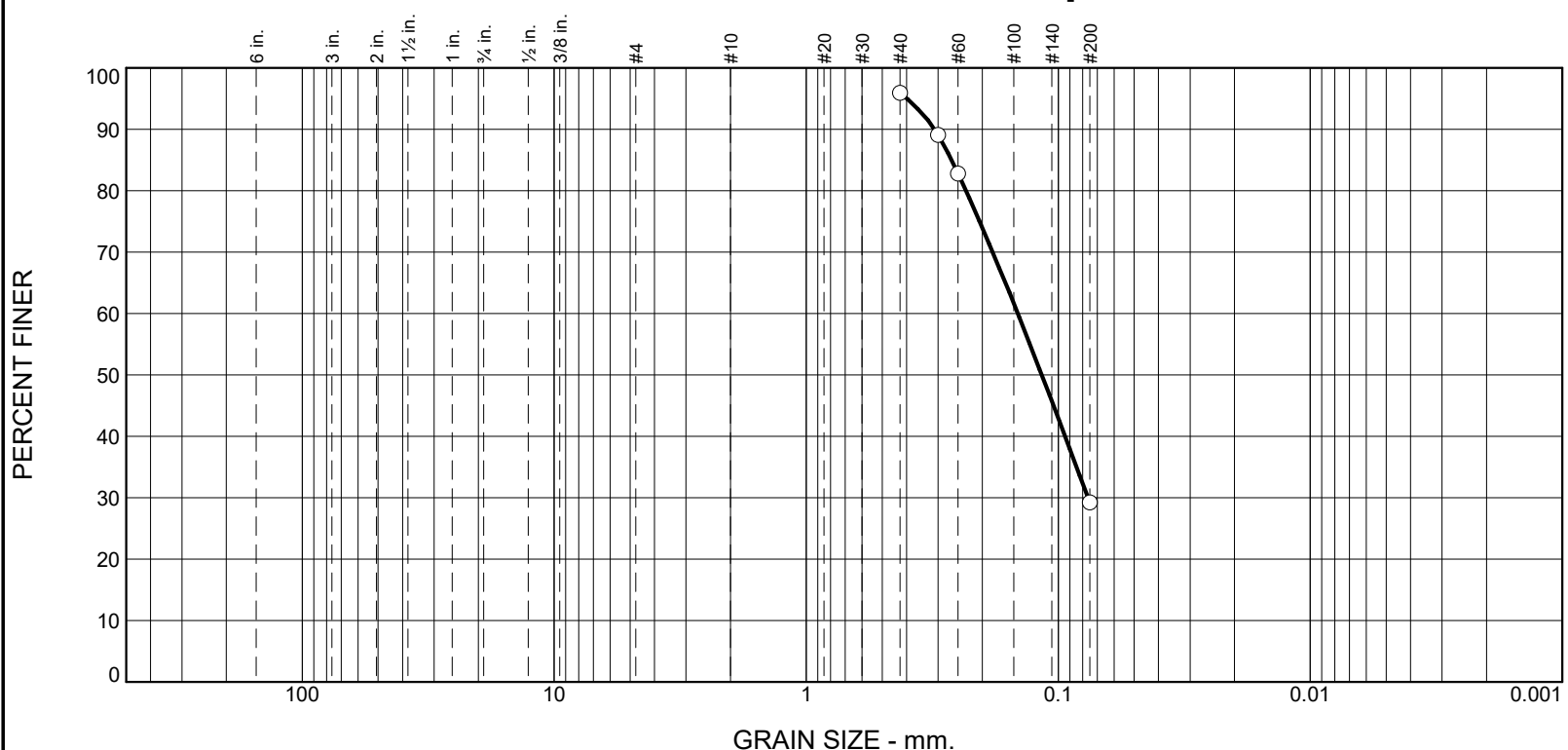
Client: Baldwin County Board of Education  
Project: Proposed Elberta High School Additions

Robertsdale, Alabama

Project No: DL 3989-23

Figure

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
					66.7	29.3	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	96.0		
#50	89.1		
#60	82.8		
#200	29.3		

Material Description		
Brown Silty Sand		
<b>Atterberg Limits (ASTM D 4318)</b> PL=                      LL=                      PI=		
<b>Classification</b> USCS (D 2487)= SM                      AASHTO (M 145)=		
<b>Coefficients</b> D <sub>90</sub> = 0.3100                      D <sub>85</sub> = 0.2652                      D <sub>60</sub> = 0.1447 D <sub>50</sub> = 0.1163                      D <sub>30</sub> = 0.0762                      D <sub>15</sub> = D <sub>10</sub> =                      C <sub>u</sub> =                      C <sub>c</sub> =		
Remarks		
Date Received:                      Date Tested: 9/25/2023 Tested By: HM Checked By: DM Title:		

\* (no specification provided)

Location: Elberta, AL

Sample Number: C-2                      Depth: 4 ft.

Date Sampled:

**GeoCon**

Client: Baldwin County Board of Education

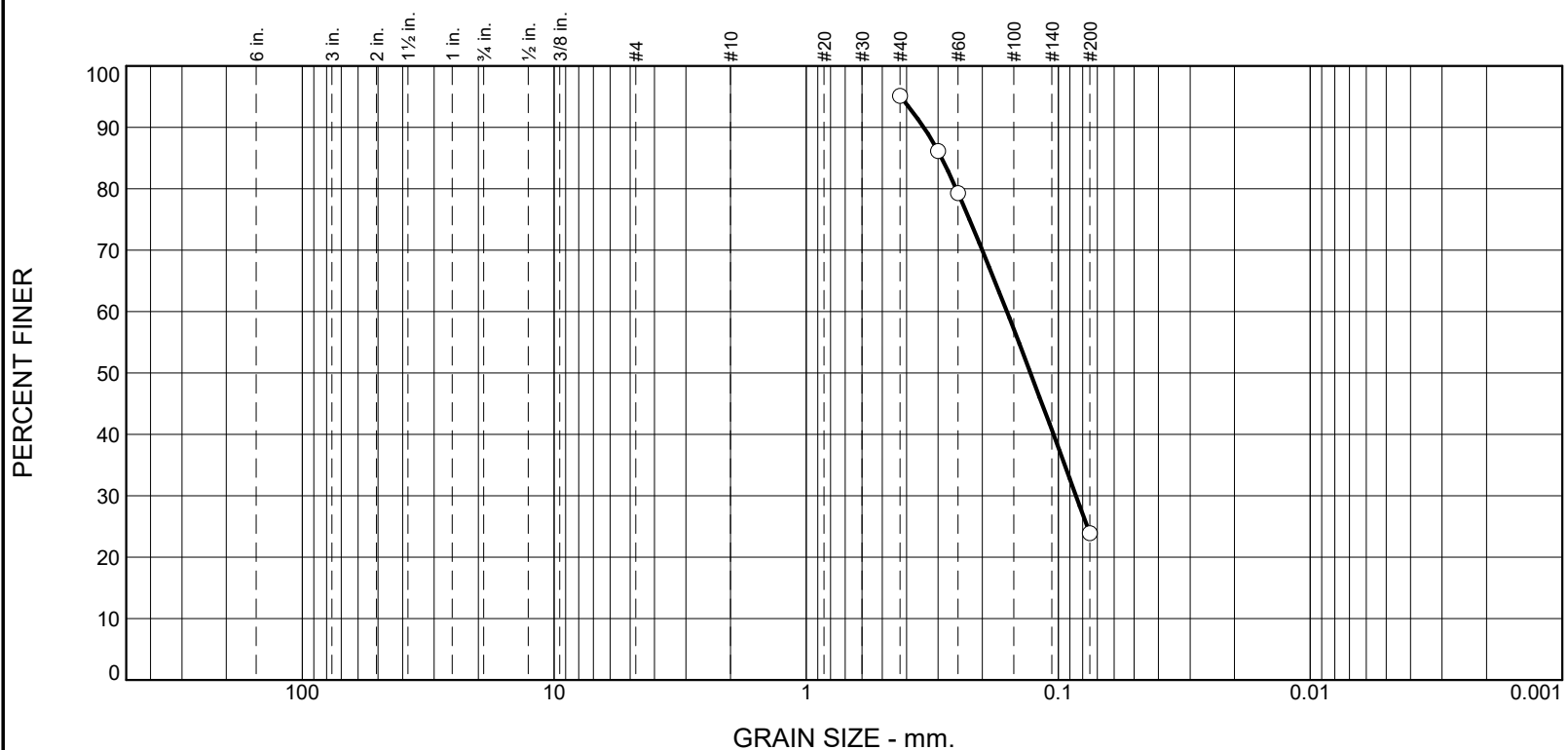
Project: Proposed Elberta High School Additions

**Robertsdale, Alabama**

Project No: DL 3989-23

Figure

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
					71.2	23.9	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	95.1		
#50	86.1		
#60	79.3		
#200	23.9		

\* (no specification provided)

<b>Material Description</b>		
Gray Silty Sand		
<b>Atterberg Limits (ASTM D 4318)</b>		
PL=	LL=	PI=
<b>Classification</b>		
USCS (D 2487)=	SM	AASHTO (M 145)=
<b>Coefficients</b>		
D <sub>90</sub> = 0.3419	D <sub>85</sub> = 0.2903	D <sub>60</sub> = 0.1599
D <sub>50</sub> = 0.1288	D <sub>30</sub> = 0.0850	D <sub>15</sub> =
D <sub>10</sub> =	C <sub>u</sub> =	C <sub>c</sub> =
Remarks		
Date Received: _____ Date Tested: 9/25/2023		
Tested By: HM		
Checked By: DM		
Title: _____		

Location: Elberta, AL  
Sample Number: C-4 Depth: 2 ft.

Date Sampled:

GeoCon

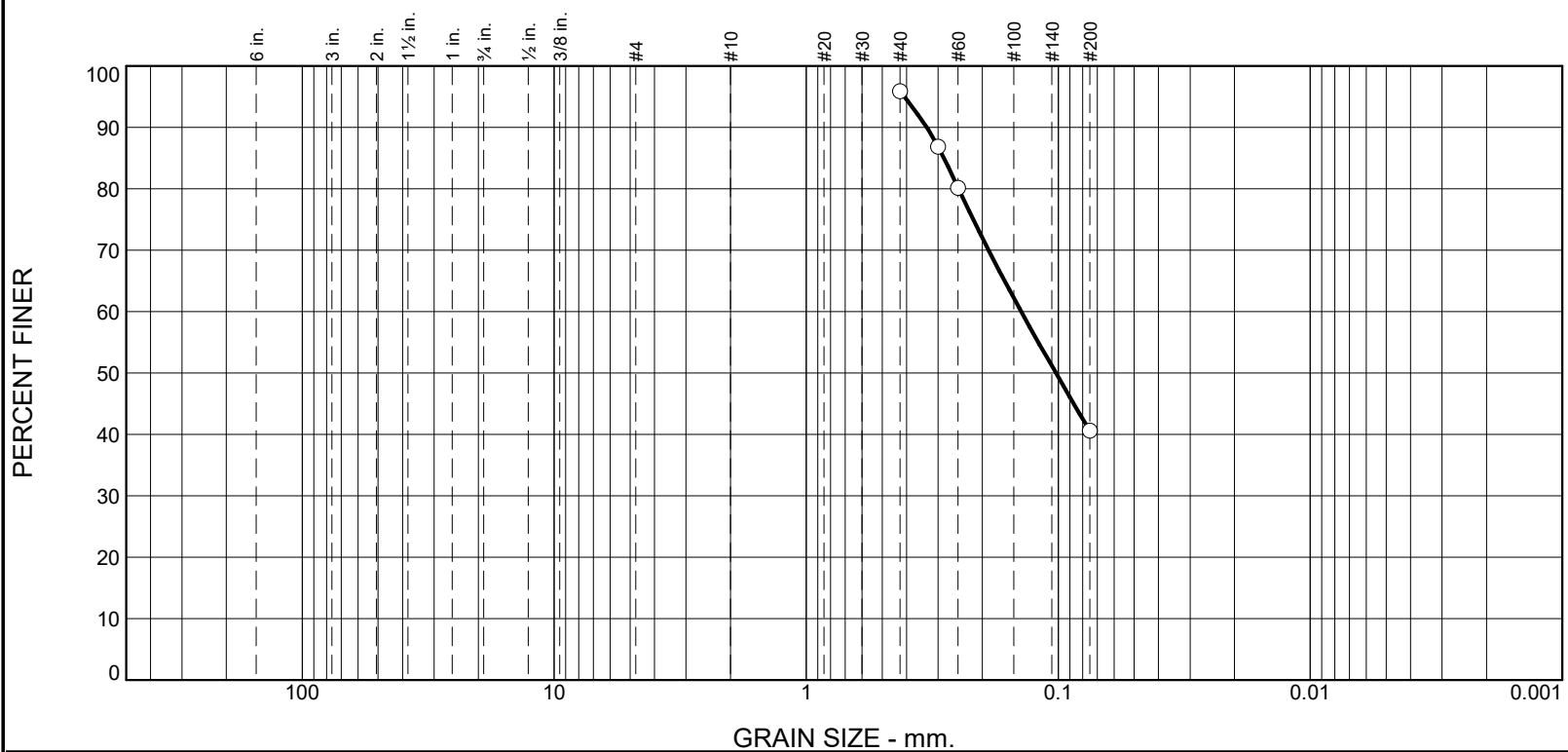
Client: Baldwin County Board of Education  
Project: Proposed Elberta High School Additions

Robertsdale, Alabama

Project No: DL 3989-23

Figure

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0					55.3	40.6	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	95.9		
#50	86.9		
#60	80.2		
#200	40.6		

\* (no specification provided)

<b>Material Description</b>		
Tan Clayey Sand		
<b>Atterberg Limits (ASTM D 4318)</b>		
PL= 21	LL= 32	PI= 11
<b>Classification</b>		
USCS (D 2487)= SC	AASHTO (M 145)=	
<b>Coefficients</b>		
D <sub>90</sub> = 0.3326	D <sub>85</sub> = 0.2843	D <sub>60</sub> = 0.1403
D <sub>50</sub> = 0.1021	D <sub>30</sub> =	D <sub>15</sub> =
D <sub>10</sub> =	C <sub>u</sub> =	C <sub>c</sub> =
<b>Remarks</b>		
Moisture: 17.5%		
<b>Date Received:</b> _____ <b>Date Tested:</b> 9/25/2023		
<b>Tested By:</b> HM		
<b>Checked By:</b> DM		
<b>Title:</b> _____		

**Location:** Elberta, AL  
**Sample Number:** C-6 **Depth:** 4 ft.

**Date Sampled:**

**GeoCon**

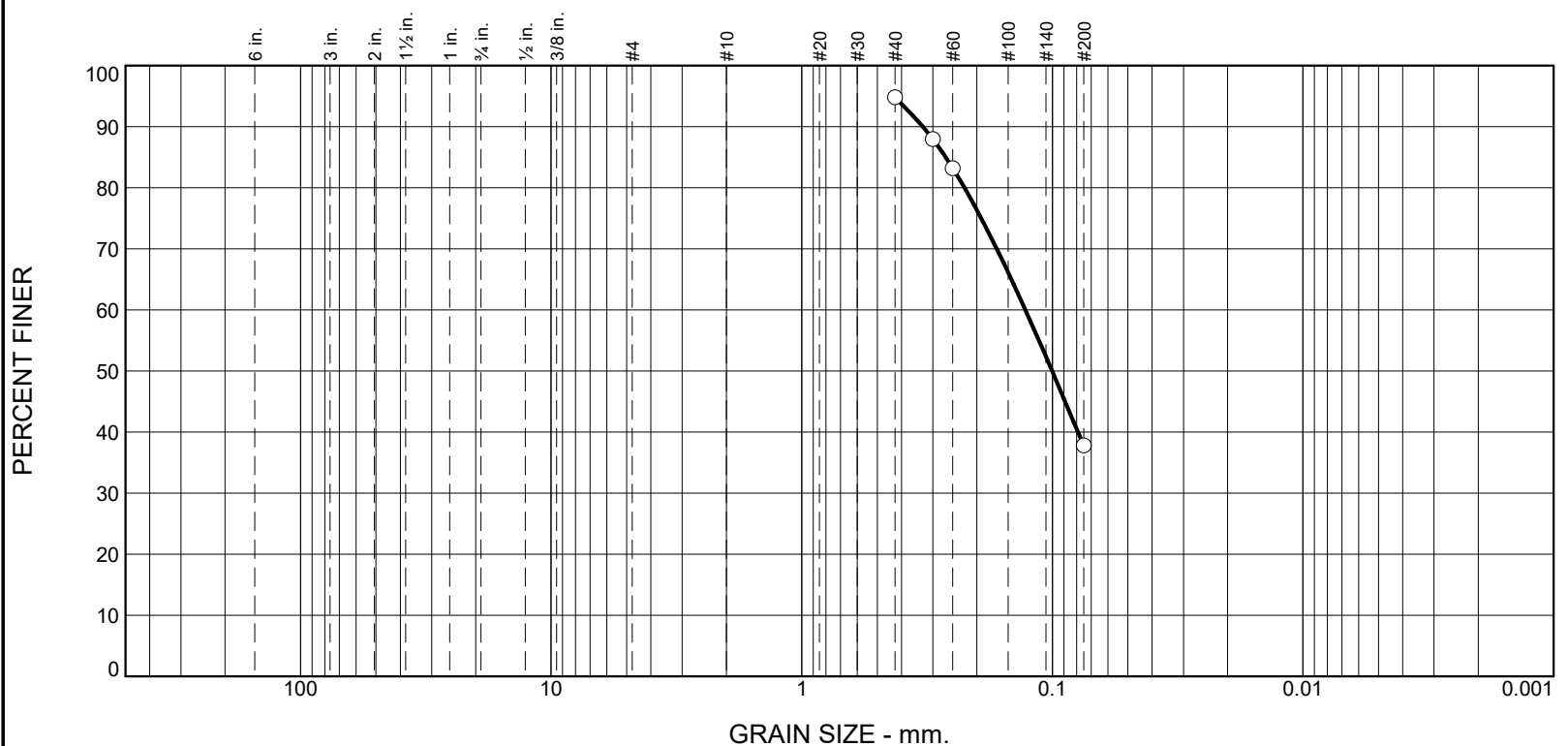
**Client:** Baldwin County Board of Education  
**Project:** Proposed Elberta High School Additions

**Robertsdale, Alabama**

**Project No:** DL 3989-23

**Figure**

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0					57.0	37.8	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	94.8		
#50	88.0		
#60	83.2		
#200	37.8		

\* (no specification provided)

<b>Material Description</b> Tan Silty-Clayey Sand		
<b>Atterberg Limits (ASTM D 4318)</b> PL= 17      LL= 22      PI= 5		
<b>Classification</b> USCS (D 2487)= SC-SM      AASHTO (M 145)=		
<b>Coefficients</b> D <sub>90</sub> = 0.3292      D <sub>85</sub> = 0.2667      D <sub>60</sub> = 0.1281 D <sub>50</sub> = 0.1002      D <sub>30</sub> =      D <sub>15</sub> = D <sub>10</sub> =      C <sub>u</sub> =      C <sub>c</sub> =		
<b>Remarks</b> Moisture: 16.3%		
Date Received: _____ Date Tested: 9/25/2023 Tested By: HM Checked By: DM Title: _____		

Location: Elberta, AL  
 Sample Number: C-8      Depth: 2 ft.

Date Sampled:

**GeoCon**

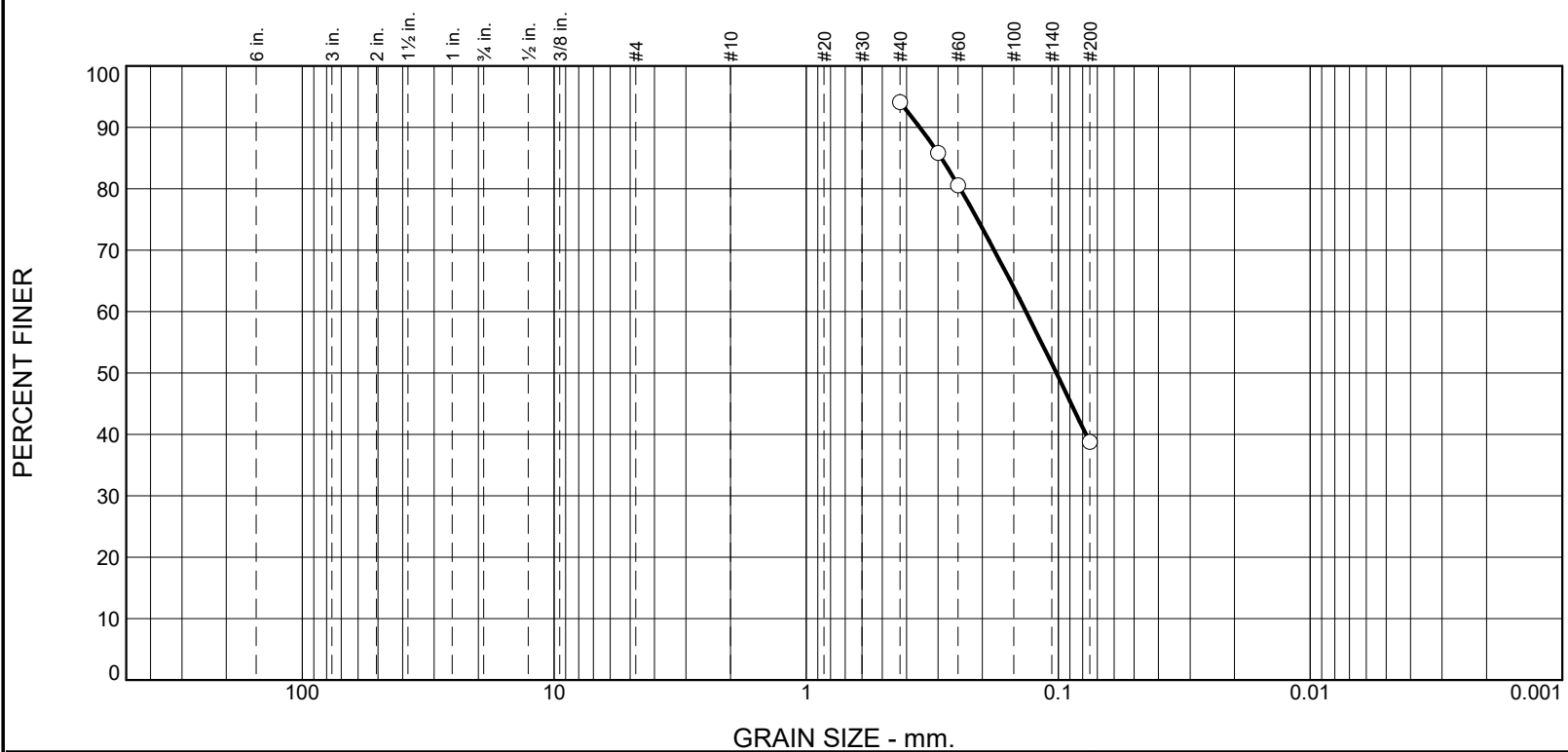
Client: Baldwin County Board of Education  
 Project: Proposed Elberta High School Additions

**Robertsdale, Alabama**

Project No: DL 3989-23

Figure

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
					55.3	38.8	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	94.1		
#50	85.8		
#60	80.6		
#200	38.8		

\* (no specification provided)

<b>Material Description</b>		
Tan Clayey Sand		
<b>Atterberg Limits (ASTM D 4318)</b>		
PL=	LL=	PI=
<b>Classification</b>		
USCS (D 2487)=	SC	AASHTO (M 145)=
<b>Coefficients</b>		
D <sub>90</sub> = 0.3545	D <sub>85</sub> = 0.2909	D <sub>60</sub> = 0.1343
D <sub>50</sub> = 0.1018	D <sub>30</sub> =	D <sub>15</sub> =
D <sub>10</sub> =	C <sub>u</sub> =	C <sub>c</sub> =
Remarks		
Date Received: _____ Date Tested: 9/25/2023		
Tested By: HM		
Checked By: DM		
Title: _____		

Location: Elberta, AL  
Sample Number: B-4 Depth: 2 ft.

Date Sampled:

GeoCon

Client: Baldwin County Board of Education  
Project: Proposed Elberta High School Additions

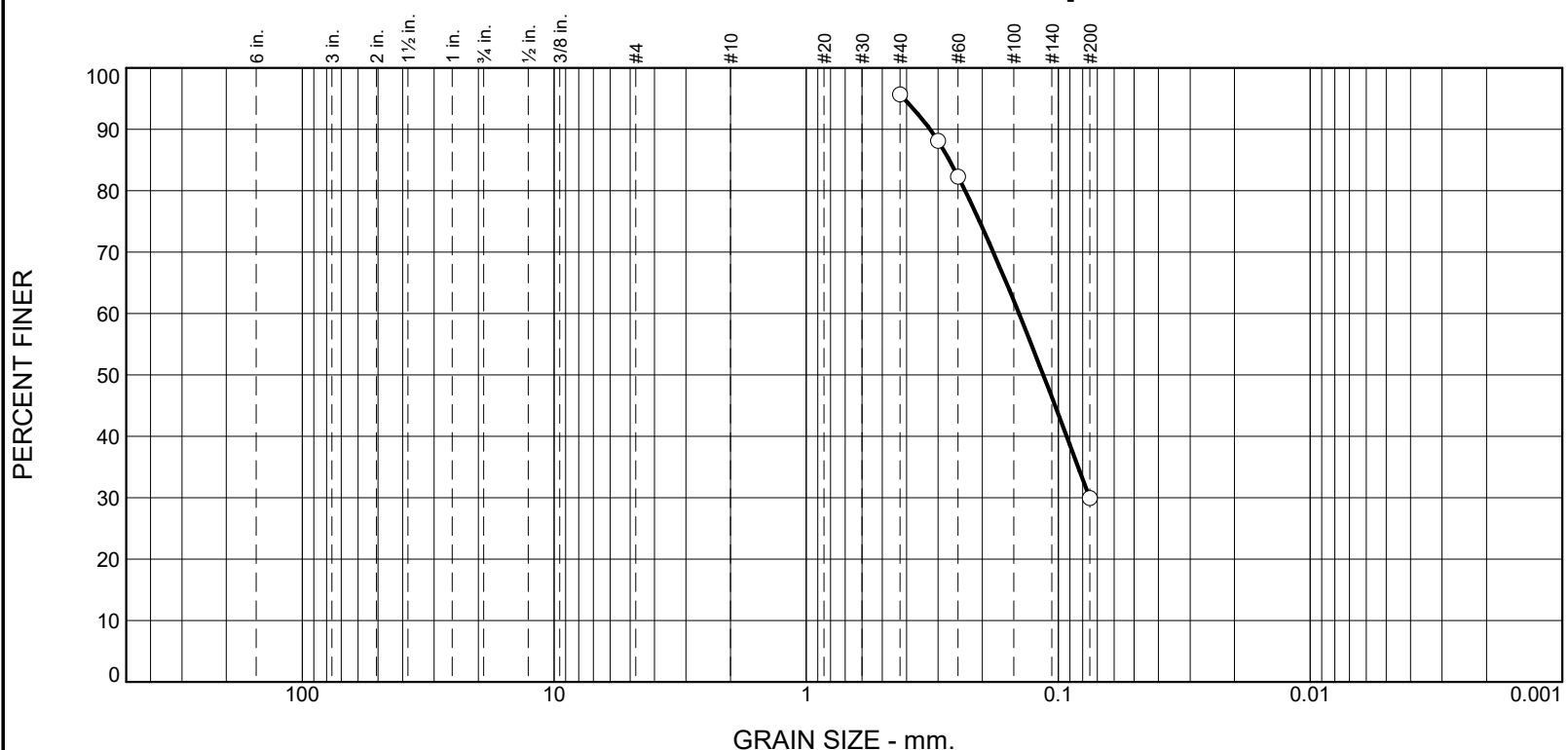
Robertsdale, Alabama

Project No: DL 3989-23

Figure



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
					65.7	30.0	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	95.7		
#50	88.1		
#60	82.3		
#200	30.0		

\* (no specification provided)

<b>Material Description</b>		
Tan Silty Sand		
<b>Atterberg Limits (ASTM D 4318)</b>		
PL=	LL=	PI=
<b>Classification</b>		
USCS (D 2487)=	SM	AASHTO (M 145)=
<b>Coefficients</b>		
D <sub>90</sub> = 0.3225	D <sub>85</sub> = 0.2710	D <sub>60</sub> = 0.1431
D <sub>50</sub> = 0.1147	D <sub>30</sub> = 0.0750	D <sub>15</sub> =
D <sub>10</sub> =	C <sub>u</sub> =	C <sub>c</sub> =
Remarks		
Date Received: _____ Date Tested: 9/25/2023		
Tested By: HM		
Checked By: DM		
Title: _____		

Date Sampled:

Location: Elberta, AL  
Sample Number: B-6 Depth: 4 ft.

GeoCon

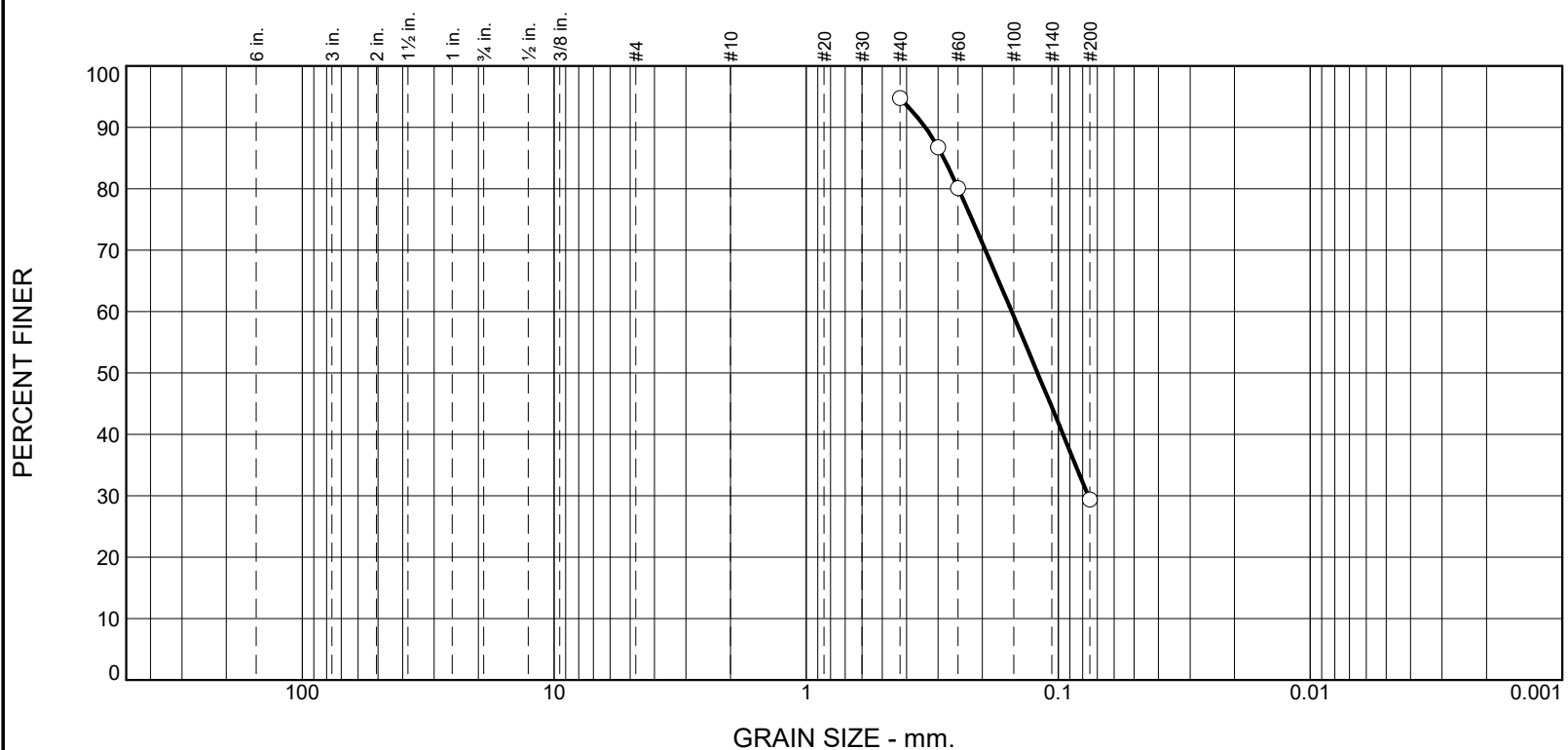
Robertsdale, Alabama

Client: Baldwin County Board of Education  
Project: Proposed Elberta High School Additions

Project No: DL 3989-23

Figure

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
					65.4	29.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	94.8		
#50	86.8		
#60	80.1		
#200	29.4		

\* (no specification provided)

<b>Material Description</b>		
Gray Silty Sand		
<b>Atterberg Limits (ASTM D 4318)</b>		
PL=	LL=	PI=
<b>Classification</b>		
USCS (D 2487)=	SM	AASHTO (M 145)=
<b>Coefficients</b>		
D <sub>90</sub> =	0.3368	D <sub>85</sub> = 0.2846
D <sub>50</sub> =	0.1208	D <sub>30</sub> = 0.0760
D <sub>10</sub> =		C <sub>u</sub> =
D <sub>60</sub> =	0.1529	D <sub>15</sub> =
C <sub>c</sub> =		
Remarks		
Date Received: _____ Date Tested: 9/25/2023		
Tested By: HM		
Checked By: DM		
Title: _____		

Location: Elberta, AL  
Sample Number: B-8 Depth: 4 ft.

Date Sampled:

GeoCon

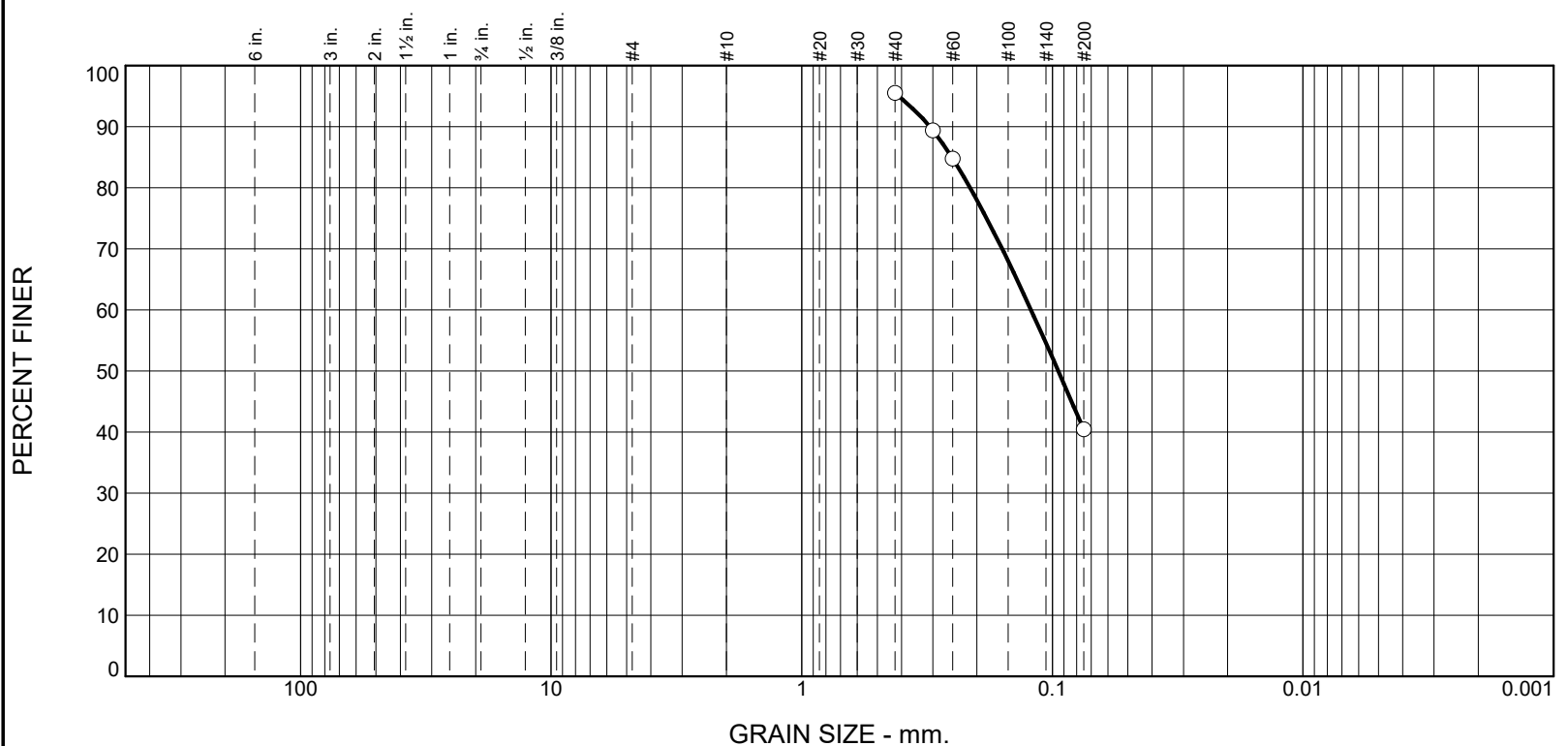
Client: Baldwin County Board of Education  
Project: Proposed Elberta High School Additions

Robertsdale, Alabama

Project No: DL 3989-23

Figure

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0					55.1	40.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	95.5		
#50	89.4		
#60	84.8		
#200	40.4		

\* (no specification provided)

<b>Material Description</b>		
Tan Clayey Sand		
<b>Atterberg Limits (ASTM D 4318)</b>		
PL= 19	LL= 28	PI= 9
<b>Classification</b>		
USCS (D 2487)= SC	AASHTO (M 145)=	
<b>Coefficients</b>		
D <sub>90</sub> = 0.3081	D <sub>85</sub> = 0.2522	D <sub>60</sub> = 0.1216
D <sub>50</sub> = 0.0947	D <sub>30</sub> =	D <sub>15</sub> =
D <sub>10</sub> =	C <sub>u</sub> =	C <sub>c</sub> =
<b>Remarks</b>		
Moisture: 16.5%		
<b>Date Received:</b> _____		<b>Date Tested:</b> 9/25/2023
<b>Tested By:</b> HM		
<b>Checked By:</b> DM		
<b>Title:</b> _____		

**Location:** Elberta, AL  
**Sample Number:** B-13 **Depth:** 4 ft.

**Date Sampled:**

**GeoCon**

**Robertsdale, Alabama**

**Client:** Baldwin County Board of Education  
**Project:** Proposed Elberta High School Additions

**Project No:** DL 3989-23

**Figure**

# SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS  MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS  (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS  MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS  (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS  LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS  LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

# Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

**The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.**

## Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

## Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

*Do not rely on this report if your geotechnical engineer prepared it:*

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.*

## Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

## You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*



responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

### Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

### This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

### This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

### Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

*conspicuously that you’ve included the material for information purposes only.* To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

### Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

### Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists.*



**GEOPROFESSIONAL  
BUSINESS  
ASSOCIATION**

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## TERMS AND CONDITIONS

**SERVICES TO BE PROVIDED.** GeoCon Engineering & Material Testing, Inc. (hereinafter GeoCon) is an independent consultant and agrees to provide Client, for its sole benefit and exclusive use, consulting services set forth in our proposal.

**PAYMENT TERMS.** Client agrees to pay our invoice upon receipt. If payment is not received within 30 days from the invoice date, Client agrees to pay a service charge on the past due amount at a rate of 1.5% per month, and GeoCon reserves the right to suspend all work until payment is received. No deduction shall be made from our invoice on account of liquidated damages or other sums withheld from payments to contractors or others.

**TERMINATION.** Either party may terminate this Agreement without cause upon 20 days advance notice in writing. In the event Client requests termination prior to completion of the proposed services, Client agrees to pay GeoCon for all costs incurred plus reasonable charges associated with termination of the work.

**PROFESSIONAL LIABILITY.** Notwithstanding any other provision of this Agreement, the Engineer's and GeoCon's total liability to the Owner for any loss or damages from claims arising out of or in connection with this Agreement from any cause including the Engineer's strict liability, breach of contract, or professional negligence, errors and omissions (whether claimed in tort, contract, strict liability, nuisance, by statute or otherwise) shall not exceed the lesser of the total contract price of this Agreement or the proceeds paid under Engineer's liability insurance in effect at the time such claims are made. The Owner hereby releases the Engineer from any liability exceeding such amount. In no event shall either party to this Agreement be liable to the other for special, indirect, incidental or consequential damages, whether or not such damages were foreseeable at the time of the commencement of the work under this Agreement.

**SITE OPERATIONS.** Client will arrange for right-of-entry to all applicable properties for the purpose of performing studies, tests and evaluations pursuant to the agreed services. Client represents that it possesses necessary permits and licenses required for its activities at the site.

**OWNERSHIP AND USE OF PROJECT DOCUMENTS.** All documents are instruments of service in respect to the Services, and Engineer shall retain an ownership and proprietary property interest therein (including the right of reuse at the discretion of the Engineer) whether or not the Services are completed. Client may make and retain copies of documents for information and reference in connection with the services by Client. Such documents are not intended or represented to be suitable for reuse by Client or others on extensions of the services or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Client's sole risk and without liability or legal exposure to Engineer or to Engineer's consultants. Client shall indemnify and hold harmless Engineer and Engineer's consultants from all claims. Damages, and expenses including attorneys' fees arising out of or resulting therefrom.

**ADDITIONAL SERVICES OF CONSULTANT.** If authorized in writing by the Client, GeoCon shall furnish additional services that are not considered as an integral part of the Scope of Services outlined in the Proposal Acceptance Sheet. Under this Agreement, all costs for additional services will be negotiated as to activities and compensation. In addition, it is possible that unforeseen conditions may be encountered that could substantially alter the original scope of services. If this occurs, GeoCon will promptly notify and consult with Client and any additional services will be negotiated.

**ASSIGNABILITY.** GeoCon shall not assign any interest on this Agreement, and shall not transfer any interest in the same (whether by assignment or novation) without the prior written consent of the Client; provided, however, that claims for money by GeoCon against Client under this Agreement may be assigned to a bank, trust company, or other financial institution without such approval. Written notice of any such assignment or transfer shall be promptly furnished to the Client.

**SERVICES TO BE CONFIDENTIAL.** All services, including opinions, designs, drawings, plans, specifications, reports and other services and information, to be furnished by GeoCon under this Agreement are confidential and shall not be divulged, in whole or in part, to any person, other than to duly authorized representatives of the Client, without prior written approval of the Client, except by testimony under oath in a judicial proceeding or as otherwise required by law. GeoCon shall take all necessary steps to ensure that no member of its organization divulges any such information except as may be required by law.

**CLAIMS.** The parties agree to attempt to resolve any dispute without resort to litigation. However, in the event a claim is made that results in litigation, and the claimant does not prevail at trial, then the claimant shall pay all costs incurred in defending the claim, including reasonable attorney's fees. The claim will be considered proven if the judgment obtained and retained through any applicable appeal is at least ten percent greater than the sum offered to resolve the matter prior to the commencement of trial.

**SEVERABILITY.** It is understood and agreed by the parties hereto, that if any part, term or provisions of this Agreement is held by any court of competent jurisdiction to be illegal or in conflict with any applicable law, the validity of the remaining portion or portions of this Agreement shall not be affected and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term or provision held to be invalid.

**SURVIVAL.** All obligations arising prior to the termination of this Agreement and all provisions of this Agreement allocating responsibility or liability between Client and GEOCON shall survive the completion of the services and the termination of this Agreement.

**INTEGRATION.** This Agreement, the attached documents and those incorporated herein constitute the entire Agreement between the parties and cannot be changed except by a written instrument signed by both parties.

**GOVERNING LAW.** This Agreement shall be governed in all respects by the laws of the State of Alabama and venue shall be in Baldwin County, Alabama

## **SECTION 02282 - TERMITE CONTROL**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 SUMMARY**

- A. Provide soil treatment for termite control, as herein specified.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data and application instructions.

#### **1.4 QUALITY ASSURANCE**

- A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.
- B. Engage a professional pest control operator, licensed in accordance with regulations of governing authorities for application of soil treatment solution.
- C. Use only termiticides which bear a Federal registration number of the US Environmental Protection Agency.

#### **1.5 JOB CONDITIONS**

- A. Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.
- B. To insure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

#### **1.6 SPECIFIC PRODUCT WARRANTY**

- A. Furnish written warranty certifying that applied soil termiticide treatment will prevent infestation of subterranean termites and that if subterranean termite activity is discovered during warranty period. Contractor will re-treat soil and repair or replace damage caused by termite infestation.
  - 1. Provide warranty for a period of 5 years from date of treatment, signed by Applicator and Contractor.

### **PART 2 - PRODUCTS**

#### **2.1 SOIL TREATMENT SOLUTION**

- A. Use an emulsible concentrate termiticide for dilution with water, specially formulated to prevent infestation by termites. Fuel oil will not be permitted as a diluent. Provide a solution consisting of one of the following chemical elements and concentrations:
  - 1. Water based emulsion, uniform composition, synthetic dye to permit visual identification of treated soil, of a generic chemical type in compliance with state and federal law and regulations.
- B. Solutions as recommended by Applicator and approved for intended application by jurisdictional authorities. Use only soil treatment solutions which are not injurious to planting or persons.

### **PART 3 – EXECUTION**

#### **3.1 APPLICATION**

- A. Surface Preparation: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under



slabs, if recommended by toxicant manufacturer.

- B. Application Rates: Water to be added to solution at job site in the presence of field Superintendent. Apply soil treatment solution at a rate as recommended by the manufacture at the following locations:
- C. Under slab-on-grade structures, treat soil before concrete slabs are placed, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab and around interior column footers.
- D. Apply chemical solution to soil in critical areas under slab, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab and around interior column footers.
  - 1. Apply chemical solution as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply chemical solution to areas where fill is washed gravel or other coarse absorbent material.
  - 2. Apply chemical solution for each foot of depth from grade to footing, along outside edge of building. Dig a trench 6" to 8" wide along outside of foundation to a depth of not less than 12". Punch holes to top of footing at not more than 12" o.c. and apply chemical solution. Mix chemical solution with the soil as it is being replaced in trench.
- E. Under crawl-space and basement structures, treat soil along exterior and interior walls of foundations with shallow footings as specified above for exterior of slab-on-grade structures.
- F. Treat soil under or around crawl-space structures as follows:
  - 1. Apply chemical solution along inside of foundation walls, along both sides of interior partitions, and around piers and plumbing. Do not apply an overall treatment in crawl spaces.
  - 2. Apply chemical solution for each foot of depth from grade to footing, along outside of foundation walls, including part beneath entrance platform porches, etc.
  - 3. Apply chemical solution along the side and outside of foundation walls of porches.
  - 4. Apply as an overall treatment, only where attached concrete platform and porches are on fill or ground.
- G. At hollow masonry foundations or grade beams, treat voids.
- H. At expansion joints, control joints, and areas where slabs will be penetrated, apply chemical solution.
- I. Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.
- J. Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

#### **END OF SECTION**

## **02512 - ASPHALT PAVEMENT SEALCOATING**

### **PART 1 - GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.
- B. Asphalt Pavement Sealcoating

#### **1.2 REFERENCE STANDARDS**

- A. American Society for Testing Materials (ASTM)
  - 1. D 2939-03 Standard Test Methods for Emulsified Bitumens Used as Protective Coatings
  - 2. The following ASTM test methods: D140, D466, D529, D244, C88, C131, C117, C127, C123, D1310, D2170, D95, D402, D2171, D5, D113, D2042, D711, D969, D1475, D3960, D2486, E70, D562, D3583, D3236, D5249, D6690, B117, D977
  - 3. MasterSeal Asphalt Pavement Sealer meets ASTM D8099/D8099M-17 Standard Specification for Asphalt Emulsion Pavement Sealer.

#### **1.3 SUBMITTALS**

- A. Product Data
  - 1. Submit manufacturer's Product Data Sheet.

#### **1.4 PROJECT/SITE CONDITIONS**

- A. Ambient Conditions
  - 1. Both surface and ambient temperature must be a minimum of 50°F and rising before applying cold applied crack fillers, oil spot primers, pavement sealers or traffic paints (materials). Ambient and surface temperature shall not drop below 50°F for a 24 hour period following application of materials.
  - 2. Apply materials during dry conditions when rain is not imminent or forecast for at least 24 hours after application.
- B. Pavement/Surface Conditions
  - 1. Newly placed (paved) asphalt pavement surfaces should be allowed to cure a minimum of four (4) weeks under ideal weather conditions (70°F) before applying coatings.
  - 2. New pavement surfaces shall be free of residual oils or chemicals associated with the placement of new asphalt pavement.
  - 3. Aged pavement surfaces shall be cleaned and prepared as recommended in this specification under PART 3 Sections 3.1 thru 3.7 of this specification.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURER**

- A. SealMaster Pavement Products and Equipment; Phone: 800-395-7325. Website: [www.sealmaster.net](http://www.sealmaster.net). E-mail: [info@sealmaster.net](mailto:info@sealmaster.net).
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

#### **2.2 MATERIALS**

- A. SealMaster Trowel Grade Crack Filler
  - 1. Polymer modified asphalt emulsion fortified with mineral filler and specifically graded aggregate.

2. Designed to fill cracks up to 1" wide in asphalt pavement
3. Repairs damaged asphalt and provides a protective barrier against moisture intrusion into cracks
4. Do not dilute. Apply by trowel, squeegee or straightedge
5. Non-volatiles by weight (%): 75%
6. Specific gravity: 1.25 min.
7. Adhesion and resistance to water: No penetration or loss of adhesion
8. Resistance to heat: No blistering or sagging
9. Flexibility: No cracking or flaking
10. Resistance to Impact: No chipping, flaking or cracking

**B. SealMaster Pothole Patch (Cold Patch)**

1. Cold-applied all-weather pothole patch featuring a unique blend of asphaltic resins, oils, polymer and aggregate
2. A long lasting, economical approach to filling potholes in asphalt and concrete surfaces
3. PatchMaster is placed directly from bag or container into pothole and compacted
4. Gradation of PatchMaster Aggregate:

<b>a. <u>Sieve Size of aggregate:</u></b>		<b><u>% Passing</u></b>
i.	3/8" .....	100%
ii.	4 mesh screen.....	20-85%
iii.	8 mesh screen.....	2-40%
iv.	16 mesh screen.....	0-10%
v.	50 mesh screen.....	0-6%
<b>b. <u>Characteristics of Aggregate:</u></b>		
i.	Soundness Loss.....	12 % Max
ii.	Los Angeles Abrasion.....	40% Max
iii.	#200 Sieve (by wash).....	2% Max
iv.	Absorption.....	1-2% Max
v.	Soft Aggregate.....	3% Max

**5. Bituminous Material:**

a.	Flash Point.....	94°C (200°F)
b.	Kinematic Viscosity @ 60°C (140°F).....	300-400
c.	Water.....	0.2% Max
<b>d. Distillate Tests:</b>		
i.	To 225°C (437°F).....	0
ii.	To 260°C (500°F).....	0-5%
iii.	To 315°C (600°F).....	0-25%
iv.	Residue @ 300°C (600°F).....	72-95%
<b>e. Residue Tests:</b>		
i.	Viscosity @ 60°C (140°F).....	125-425 Poises
ii.	Penetration.....	200 Min.

- iii. Ductility @ 4°C (39°) 1 cm/min. .... 100 Min.
- iv. Solubility in Trichloroethylene..... 99%

C. MasterSeal

- 1. Clay-stabilized, mineral filled asphalt emulsion sealcoat
- 2. Designed for protecting, renewing and beautifying asphalt pavement surfaces
- 3. Protects pavement against weather, UV rays, and environmental distress
- 4. Designed to mixed on-site with water, SealMaster Top Tuff polymer additive, silica sand or other approved aggregate
- 5. Applied to properly cleaned asphalt surface by spray, brush or squeegee
- 6. Non-volatiles (%): 47 Min.
- 7. Ash content of non-volatiles (%): 30-60 Min.
- 8. Specific Gravity @ 25°F: 1.18 Min.
- 9. Drying Time: 8 hours Max.
- 10. Adhesion & resistance to water: No penetration or loss of adhesion
- 11. Resistance to heat: No blistering or sagging
- 12. Flexibility: No cracking or flaking
- 13. Resistance to impact: No chipping, Flaking or Cracking

D. SealMaster TTP-1952B Traffic Paint (White and Yellow)

- 1. 100 % Acrylic Water-based Traffic Paint
- 2. Meets Federal Specification TT-P- 1952B
- 3. Apply with standard cold-applied traffic marking spray equipment
- 4. Do not dilute.
- 5. Volatile Organic Content (VOC): <50g/l
- 6. Viscosity (KU): 70-110 KU
- 7. Solids by Weight (%): 60% Min.
- 8. Scrub Resistance: 1,000 cycles Min.
- 9. Dry Opacity: .965
- 10. Directional Reflectance (%): White 86%; Yellow 50
- 11. Drying Time for no Pick-up, minutes: <30 minutes

E. SealMaster Handicap Blue Traffic Paint

- 1. 100 % Acrylic Water-based Traffic Paint for Handicap markings on pavement
- 2. Apply with standard cold-applied traffic marking spray equipment, brush or roller
- 3. Do not dilute
- 4. Volatile Organic Content (VOC): <50g/l
- 5. Viscosity (KU): 70-110 KU
- 6. Solids by Weight (%): 50% Min.
- 7. Scrub Resistance: 1,000 Cycles Min.
- 8. Drying Time for no Pick-up, minutes: <30 minutes

F. SealMaster Firelane Red Traffic Paint

1. 100% Acrylic Water-based Traffic Paint for delineating Fire Lanes and Zones in parking lot areas
2. Apply with standard cold-applied traffic marking spray equipment, brush or roller
3. Do not dilute
4. Volatile Organic Content (VOC): <50 g/l
5. Viscosity (KU): 70-110 KU
6. Solids by weight (%): 50% Min.
7. Scrub Resistance: 1,000 Cycles Min.
8. Drying Time for no Pick-up, minutes: <30 minutes

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine pavement surface prior to performing work
- B. Notify architect or project engineer of any adverse or unacceptable conditions that would affect successful repair efforts or application of materials
- C. Do not commence work until unacceptable conditions are corrected

#### **3.2 SURFACE PREPARATION**

- A. Surface must be clean and free from all loose material and dirt. Remove grass along edge of pavement to find true edge of pavement. Power blowers, mechanical sweeping devices and push brooms are acceptable cleaning methods.

#### **3.3 CRACK REPAIR**

- A. Cold Applied Crack Filling Materials and Methods
  1. Clean cracks of all dirt, debris and vegetation prior applying crack filling.
  2. For cracks up to ½" apply FlexMaster Crack Sealant. FlexMaster may be applied directly from container, pour pot, crack banding equipment or mechanized pumping equipment. Allow to dry before sealcoating.
  3. For cracks larger than ½" wide and up to 1" wide apply SealMaster Trowel Grade Crack Filler. Apply Trowel Grade with trowel, squeegee or straightedge. Allow to dry before sealcoating.
  4. Contractor shall refer to Manufacturer's Product Data Sheet for more detailed application instructions for Flexmaster and Trowel Grade Crack Filler.

#### **3.4 POTHOLE REPAIR**

- A. Fill Potholes with SealMaster PatchMaster Pothole Patch
  1. Remove loose material, debris and standing water from pothole prior to application.
  2. Apply PatchMaster directly from bag into pothole
  3. Compact PatchMaster with a hand tamper, vibratory-plate compactor or asphalt roller. Finished patchwork shall be flush and level with adjoining pavement.
  4. Contractor shall refer to Manufacturer's Product Data Sheet for more detailed application instructions for SealMaster PatchMaster Pothole Patch.

#### **3.5 MASTERSEAL APPLICATION**

- A. Applying MasterSeal
  1. Remove all loose material and dirt from pavement surface. Remove grass along edge of

pavement to find true edge of pavement. Power blowers, mechanical sweeping devices and push brooms are acceptable cleaning methods.

2. Equipment used to apply MasterSeal shall have continuous agitation or mixing capabilities to maintain homogeneous consistency of pavement sealer mixture throughout the application process. Spray equipment shall be capable of mixing and spraying pavement sealer with sand added. Self-propelled squeegee equipment with mixing capability shall have at least 2 squeegee or brush devices (one behind the other) to assure adequate distribution and penetration of sealer into pavement surface. Hand squeegees and brushes shall be acceptable in areas where practicality prohibits the use of mechanized equipment.
3. MasterSeal shall be mixed in accordance with the following mix design (based on 100 gallons of MasterSeal for ease of calculation):
  - a. MasterSeal..... 100 gallons
  - b. Water..... 15-25 gallons
  - c. Top Tuff..... 1 gallon
  - d. Sand (40 to 70 mesh AFS fineness gradation).....300-500 lbs.
4. Apply two coats of mixed MasterSeal at a rate of .11 to .13 gallon per square yard per coat to entire pavement area. Allow first coat to dry thoroughly before applying second coat.
5. Apply a third coat of mixed MasterSeal at a rate of .11 to .13 gallon per square yard to high traffic areas including parking area entrances, exits and drive lanes (or as specified in additional diagrams or drawings). Allow second coat to dry thoroughly before applying a third coat to these areas.
6. Allow final coat of pavement sealer to dry 24 hours prior to applying SealMaster 100 % Acrylic Water based Traffic Paint.

### **3.6 TRAFFIC MARKINGS/LINE STRIPING**

#### **A. Applying SealMaster Traffic Paint**

1. Remove all loose material and dirt from existing pavement. Freshly applied pavement sealer shall be allowed to cure for a minimum of 24 hours prior to applying Traffic paint.
2. Apply SealMaster Traffic Paint with pressurized line striping spray equipment at wet thickness of 15 to 20 mils.
3. Apply SealMaster Handicap Blue to all handicap parking spots.
4. Allow paint to dry thoroughly prior to opening to traffic.

#### **END OF SECTION**

## **SECTION 02535 – SYNTHETIC TRACK SURFACE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### **1.2 DESCRIPTION OF WORK**

- A. Removal of the existing track surface to the existing asphalt paving and furnish and install new **Polyurethane Track Surface**.

#### **1.3 SUMMARY**

- A. Full knowledge and understanding of all drawings, specifications, and general provisions of the bidding documents and related foundation and utilities work is required by the Synthetic Surfacing Contractor (SSC).
- B. The Synthetic Surfacing Contractor shall furnish all materials, labor, supervision and equipment necessary for the accurate completion of the synthetic track installation and all project specific work indicated on the plans and specifications.
- C. The guidelines established in this specification are to be considered minimum acceptable standards for installing a synthetic polyurethane track surface.
- D. It is the responsibility of the Synthetic Surfacing Contractor to review the plans, specifications, field conditions and verify the locations where the surface is to be installed.
- E. Contractors wishing to be considered as an “or equal” must provide documentation for their products at least 10 days prior to the bid opening.

#### **1.4 SCOPE OF WORK**

- A. The Synthetic Surfacing Contractor shall install an impermeable paved-in-place synthetic sport surface comprising of a base layer of polyurethane bound rubber granules, sealed, then topped with a spray-applied coat of one or two-component polyurethane and EPDM granules.
- B. The SSC shall provide all labor, materials and equipment to perform the following work:
  - 1. Review Bidding documents and specifications and verify suitability of the existing track to correct levels and the in-ground track and field equipment.
  - 2. Sufficiently clean down all areas to be surfaced and protect all areas not to receive synthetic surface.
  - 3. Install approved synthetic surfacing material on all areas as defined by the Bidding documents.
  - 4. Layout and paint all track line and event markings in accordance with the latest edition of the IAAF, NCAA, NFHS or UIL rules and regulations, as applicable, and any other details outlined by the Owner. All event markings are to be verified with the owner prior to submittal of shop drawings.

#### **1.5 COODINATION**

- A. Conduct operations while minimizing interference with other subcontractors on site. Do not obstruct walks, or other occupied facilities without permission from the Owner. Perform work while minimizing disturbance to Owner’s scheduled events on the facility.

#### **1.6 STANDARDS & CODES - GUIDELINES**

- A. Guidelines to be followed on this project are those set forth by the IAAF, NCAA, NFHS or UIL, as applicable; along with the current material testing guidelines as set forth by the American Society of Testing and Materials (ASTM).

## **1.7 QUALITY ASSURANCE**

- A. Bids will only be accepted from those SSC that have completed at least 10 Track and Field facilities that have been properly certified to meet NFSHSA specifications or rules.
- B. The synthetic track surface shall be installed by authorized applicators of the manufacturer. The Owner reserves the right of final acceptance with regards to any crew members of the SSC.
- C. Each bidder shall be fully acquainted with the existing facility and utilities and shall fully understand the difficulties and restrictions attending the execution of the work under contract. All bidders shall advise the Owner before submitting bids of any restrictions or anticipated difficulty.
- D. All material shall be guaranteed to the extent that the surfacing:
  - 1. Has been manufactured and applied in accordance with these and the manufacturer's specifications.
  - 2. Will hold fast and/or adhere to the asphalt, concrete, edging, filler and patches or overlay materials.
  - 3. Will perform as specified in these specifications and the specifications of the product manufacturer in the current standard product information literature and specification sheets.
  - 4. Is Ultra-Violet resistant and will not de-laminate, bubble, blister, fade, crack or wear excessively during the guarantee period.
  - 5. All machinery and materials used must be only those approved by the Owner and the approved manufacturer of the selected synthetic surfacing material.

## **1.8 SUBMITTAL DATA**

- A. The following submittal data must be received as part of the product submittal.
  - 1. Standard printed specifications of the polyurethane track system being installed as part of this project.
  - 2. SSC to provide a reference list showing similar projects installed in the last 10 years utilizing the same product specified.
  - 3. A synthetic track surface sample a minimum of 8"x11" in size of the track system being installed on this project.
  - 4. Installation process and requirements for the base, and any conditions that may limit the sports installation or affect quality of construction.
- B. The following information shall be submitted by the SSC as requested by the Owner prior to installation:
  - 1. Provide a minimum five (5) year manufacturer's warranty against workmanship, installation and materials on the entire synthetic surface / system.
  - 2. The SSC installing the material shall submit an affidavit attesting that the surfacing material to be installed meets the requirements defined in the manufacturers currently published specifications and any modifications outlined in these technical specifications prior to the commencement of any work.
  - 3. A letter signed by an authorized representative of the SSC, that the track and field surfacing has no measurable traces of heavy metals, leachable mercury, and any other hazardous materials identified by the EPA.
  - 4. A 8" x11" sample of the material to be installed, for testing by the owners independent laboratory to verify the above and establish parameters against which random spot tests by the owners agent during installation can be compared. This sample must be provided prior to installation.
  - 5. A further product sample 8" x 11" in size, the same color, texture, thickness, etc. as the type of surfacing to be installed for this project. This must be a representative sample of the product for comparison of color and texture during installation. This sample must be submitted and approved by the Owner prior to installation.



6. Submit shop drawings of all painted lines for events confirmed by owner to Architect for review.
7. Upon completion of all line Markings, the SSC shall submit to the Owner a certification of accuracy submitted by a Registered Engineer or Surveyor. This document shall state that the track markings and layout meets the NFSHHA requirements and the requirements of these bid documents.

## 1.9 WARRANTY

- A. The Track Surfacing System shall be fully guaranteed against faulty workmanship and material failure for a period of five (5) years from the date of acceptance. The warranty coverage shall not be prorated nor limited by the amount of usage. The warranty includes failure and damage from UV degradation, wearing through of the surface, open joints or seams, de-lamination of the new surface from the existing surface, unnatural fading, discoloration or other failure which will render the track surface unfit for competition during the warranty period, and against any release of toxic or hazardous materials into the surrounding soils, ground water or environment.
- B. Synthetic surfacing material found to be defective as a result of faulty workmanship and/or material failure shall be replaced or repaired at no charge, upon written notification within the guarantee period.

## PART 2 - MATERIALS

### 2.1 MANUFACTURERS

- A. The following Companies' products have been used to establish minimum standards for materials, workmanship and function.
  1. Hellas **epiQ TRACKS V300**; Hellas Construction Inc.; 12710 Research Blvd. Suite #240, Austin, TX 78759; Ph. 1.800.233.5714; [www.epiqtracks.com](http://www.epiqtracks.com).
  2. Beynon, A Tarkett Sports Company; 16 Alt Road, Cockeysville, Maryland Ph.: 443.465.8040; [www.beynonssports.com](http://www.beynonssports.com).
  3. Conica; 105 Westwood Place, Suite 120, Brentwood, TN 37027; Ph.: 615.499.3624; [www.conica.com](http://www.conica.com).

### 2.2 MATERIALS

- A. System Performance
  1. Thickness: 1/2" (13mm) or as specified
  2. Shore A Hardness (ASTM D-2240): 55 +/-5
  3. Elongation at break (ASTM D-412): ≥ 40%
  4. Tensile Strength (ASTM D-412): 0.80 N/mm2 @ 70F
  5. Compression Set Recovery (ASTM D-412) 90-95% @ 70F over a 24-hour period
  6. Abrasion Resistance (ASTM D-501): 0.25 grams loss after 1000 cycles
  7. Chalking (ASTM D-822): No change after 1000 hours in weather meter.
  8. Coefficient of Friction (ASTM D-1984): Dry: 0.70-0.75 / Wet: 0.60-0.65
  9. Resilience (ASTM D-2632): 38-42%
  10. Tear Resistance (ASTM D-624): 60-75 psi
  11. Color to be selected by Architect from Manufacturer Standards after bid date.
- B. System Components
  1. Primer: Polyurethane-based primers specifically formulated to be compatible with the base and track surfacing material.

2. Black SBR Granules: The rubber granules for the base mat shall be recycled SBR rubber (Styrene Butadiene Rubber), processed and chopped to 1mm-3mm size, containing less than 4% dust.
3. EPDM Granules: The rubber granules for the structural spray wearing coats shall be EPDM peroxide cured, man-made rubber containing a minimum of 18-20% EPDM and having a specific gravity of 1.5 +/-0.08. The EPDM rubber will be 0.5mm-1.5mm EPDM granules. EPDM granules shall be of the same color as the polyurethane.
4. Polyurethane Binder: Binder for the black rubber mat shall be an MDI-based and or MDI/TDI mixture, monocomponent, polyurethane-binding agent. The binding agent shall not have a TDI monomer level above 0.2%, must be clear or black in color, not milky, and must be solvent free. The binding agent must be specially formulated for compatibility with SBR rubber crumb.
5. Polyurethane (Seal Coat):
  - a. A pore sealer; minimizing component stretching shall be applied directly onto the base mat. The Single Cast Sealer (SCS) provides a thixotropic effect to seamlessly bind the base mat and polyurethane layer together, eliminating the need for rubber dust. Rubber dust application prevents effective pore sealing, as the dust acts as a deterrent to the chemical bind.
  - b. The SCS technology seals the pores by creating a mechanical lock with the subsequent layer, without the use of rubber dust. This chemistry creates a better bond minimizing porosity and the potential for delamination.
  - c. The seal coat is solvent free, two-component, thixotropic polyurethane-based on MDI. It is designed to completely seal base mat prior to topcoat application.
  - d. The topcoat is a UV stabilized, self-leveling, two-component polyurethane based on 100% MDI. The polyurethane is solvent free, "TDI Free", and contains no mercury, lead, or any other heavy metals as defined by the EPA. All polyurethane materials shall be made in the United States.
  - e. Structural Spray Coating: The spray coating shall be the MDI-based and or MDI/TDI mixture, one or two component, moisture-cured, pigmented polyurethane, specifically formulated for compatibility with EPDM granules
6. Line Marking Paint: The line marking paint shall be latex- based compatible with polyurethane synthetic track surfaces.

## PART 3 – EXECUTION

### 3.1 EXECUTION

#### A. Sub-base

1. The Synthetic Track Surfacing System shall be laid on a sub-base designed and approved by a licensed engineer. The General Contractor shall provide compaction test results of 95% or greater for the installed sub-base and the finished asphalt surface.
2. For NCAA certification, the following criteria must be followed. The track surface i.e., asphalt substrate, shall not vary from planned cross slope by more than +/-0.1% with a maximum lateral slope outside to inside of 1% and a maximum slope of 0.1% in any running direction. The finished asphalt shall not vary under a 10' straight edge more than 1/8".
3. It should be the responsibility of the Asphalt-Paving Contractor to flood the surface immediately after the asphalt is capable of handling traffic, but within 24 hours. If, after 20 minutes of drying time, there are birdbaths evident, it shall be the responsibility of the Architect, in conjunction with the Synthetic Surfacing Contractor to determine the method of correction. No cold tar patching, skin patching or sand and oil mix patching will be acceptable.

4. Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, by either chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be one inch. The curing time for the asphalt is 14-21 days. It shall be the responsibility of the surfacing contractor to determine if the asphalt substrate has cured sufficiently prior to the application of polyurethane surfacing system.
  5. It shall be the responsibility of the general contractor to determine if the asphalt substrate meets all design specifications, i.e. cross slopes, planarity and specific project criteria.
  6. Upon completion of surface test and correction of any defects, track surface contractor shall submit to Engineer or Owner a signed certificate stating the existing surface is acceptable and satisfactory for the installation of his track surface system.
- B. Synthetic Track Surface
1. New track surface to be laid on any smooth, stable base such as asphalt or concrete.
- C. Color
1. Color to be selected by Architect from Manufacturer Standards after bid date.
- D. Curing
1. Before application of the synthetic surface can begin, the asphalt should be cured for at least 14- 21 days, and a concrete base for a minimum of 28 days.
- E. Cleaning
1. The area to be surfaced shall be clean and free of any loose or foreign particles (dirt, oil, etc.) prior to commencement of the work. The surface is usually cleaned by use of a power blower and/or high-pressure washer.
- F. Priming
1. The primer shall be spray-applied in accordance with the Manufacturer's specifications. Only those areas that can be installed the same day should be primed.
- G. Black Mat
1. Job mix formulas shall be as follows:
    - a. SBR Rubber 1mm-3mm
    - b. Binding Agent 18-20% of total rubber weight
  2. The black SBR rubber granules and polyurethane binding agent are blended together using state of the art automatic metering mixer for a period of 2-3 minutes for a precise measured ratio. No hand mixing is allowed.
  3. The blended materials are then spread onto the asphalt/concrete base by means of a fully automatic paving machine with control sensors at a rate of 16-16.5 pounds per square yard. The fully automatic paving machine shall have a heated oscillating screed bar to obtain both smoothness and compaction. The heated screed bar normally works at a temperature of 158°F to 176° F.
  4. The laying procedure shall be bay-to-bay and limiting the length of the passes to avoid having any cold (cured) joints between the bays. At the beginning of each new day's work, the traverse joint from the previous day's work shall be tack coated to ensure a good bond. Small irregularities, remaining in the surface after the fully automatic paving machine has passed, may be removed using a light polyethylene or Teflon roller or hand trowelled.
  5. The surface hardens through the reaction of the binding agent with humidity. The speed of the reaction depends on temperature and relative humidity. Usually the surface may be walked upon the next day.
  6. Synthetic track materials are to be placed only when temperature is above 45°F and rising.
  7. No materials should be placed when surfaces are wet or damp, precipitation is falling or imminent, or when other unsuitable conditions for the installation of the system are present.

#### H. Impermeable Layer

1. The polyurethane seal coat A and B components are mixed at the prescribed ratio using a state of the art automatic metering mixer for a precise measured ratio, then squeegee applied to the base mat, making it impermeable.

#### I. Structural Spray Wearing Coats

1. Job mix formulas shall be as follows:
  - a. Structural Spray                      60% by weight
  - b. EPDM Rubber                      0.5mm-1.5mm 40% by weight
2. After the black mat has properly cured, apply a thixotropic mixture, using red structural spray and red EPDM granules, mixed using state of the art automatic metering mixer for a precise measured ratio, then spray-applied using the latest air spray equipment designed to handle this heavy rubber mixture. The structural spray coating is applied in two applications utilizing 1.80 pounds per square yard for each application.

#### J. Line Markings

1. All line and event markings shall be applied by experienced personnel utilizing latex based paint compatible with the synthetic track surfacing.
2. All marking dimensions will be certified in accordance with the specifications issued by the appropriate sanctioning or governing body such as IAAF, NCAA, NFHS or UIL, as applicable.
3. No striping operations may commence if temperature is 45°F and falling.
4. Do not place any paint under wet or damp conditions or when relative humidity is above 85%.
5. The line-striping machine shall be capable of producing neat, clean edges on all lines.

### 3.2 INSTALLATION

- A. The track surface shall be installed only by trained craftsmen who are full time employees. No outside installer or distributor will be sold or furnished with material for installation unless licensed by Manufacturer.
- B. It is a requirement of this specification that the selected installer be required to supply proof of insurance and conformance to the Prevailing Wage Laws, if applicable for location.

### 3.3 CLEAN-UP

- A. Inspect entire track surface for irregularities and make necessary repairs.
- B. Clean up entire track site of materials, equipment, tools and debris from track surfacing operations.

### 3.4 MAINTENANCE

- A. SSC shall provide Owner with complete care and maintenance guide to insure use and life expectancy of the surface.

## END OF SECTION

## **SECTION 02660 - WATER DISTRIBUTION SYSTEM**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 SCOPE OF WORK**

- A. The work includes construction of the water distribution system including fire lines as shown on the Drawings.
- B. Testing and disinfection of the installed system shall be incidental to the work.

#### **1.3 QUALITY ASSURANCE**

- A. Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations, and laws of local, municipal, state or federal authorities having jurisdiction.
- B. Meet all requirements of the Local Water Authority and be subject to review by System inspectors.

#### **1.4 SITE CONDITIONS**

- A. Coordinate water distribution system with pavement construction.
- B. Install water mains when grade is within 6 in. of final grade.
- C. Coordinate the Work with the Local Water Authority and pay all tap fees assessed (to include valves, backflow preventers, vaults, etc.) for portions of the Work completed by the Utility Provider.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- A. Water Main Piping:
  - 1. Water Service Piping: Ductile iron pipe or PVC pipe.
  - 2. Ductile Iron Pipe:
    - a. Manufactured in accordance with AWWA C-151, latest revision, Class 50, min.
    - b. Standard cement-lined and seal-coated with an approved bituminous seal coat in accordance with AWWA C-104, latest revision.
    - c. Approved push-on, conforming to AWWA C-111, latest revision.
- B. PVC Pipe:
  - 1. Constructed to meet the requirements of U. S. Department of Commerce Product Standard PS 22-70, and bear the National Sanitation Foundation Testing Laboratories, Inc., seal for potable water.
  - 2. For PVC piping less than 4" - Schedule 40, PVC, minimum; 150 psi minimum working pressure
  - 3. 4" or greater shall be C900 PVC piping.
- C. Fire Line:
  - 1. Fire line shall be C900 PVC piping. Encasement shall be used under drive areas.
  - 2. Connection to Main: Each hydrant shall be connected to the main pipe with a 6-inch ductile iron branch. Each hydrant shall be controlled by an independent 6-inch gate valve.
- D. Fire Hydrants:

1. All hydrants shall be Mueller Company, M & H, or an approved equal. Fire hydrants shall be equipped with traffic break away feature. Hydrants shall be painted in accordance with the requirements of AWWA C502.

E. Water Main Fittings:

1. Ductile iron fittings shall be provided in locations as shown on the plans or in locations deemed necessary by the Engineer. Ductile iron fittings 12" and smaller shall be rated for 350 psi working pressure. Fittings shall be manufactured in accordance with AWWA C153 and provided with mechanical joints. All fittings shall be provided with a thin cement lining in accordance with AWWA C104.
2. PVC Fittings: Fittings For PVC Water Mains Smaller Than 6 In. In. Dia.: As recommended by the manufacturer of the pipe furnished, suitable for use under the conditions specified for the pipe, with ring-tite or fluid-tite bells or spigots at all ends for jointing.

F. Valves and Boxes:

1. Cast Iron Valve Boxes shall be provided for all valves installed vertically and shall consist of a base covering the operating nut and head of the valve, a vertical shaft of at least 5 1/4" in diameter and a top section extending to a point even with the finish ground surface, provided with a cast iron cover marked "WATER." The valve box shall be placed concentrically over the operating nut. Precast concrete collars shall be provided around each valve box.
2. Valves 2" and Larger: Cast iron gate valves, AWWA type, the standard product of a recognized valve manufacturer such as Mueller, Iowa or M & H, constructed with an interchangeable parts system, with parts readily available, to meet the following requirements:
  - a. Iron body, bronze-mounted.
  - b. Double disc, parallel seat "O" ring seal.
  - c. 150 psi, min., working pressure.
  - d. Counterclockwise (left) opening.
  - e. 2 in. operating nut.
  - f. Non-rising stem.
  - g. Joints to be as required for pipe to be connected to.
3. Valves 2" and Smaller: Brass or bronze gate valves, conforming to Federal Specification WW-V-76.
4. Underground Valves: Two-piece, screw type, adjustable to suit the depth of bury and type of valve, with a min. shaft dia. of 5-1/4 in.
5. All mechanical joint valves and fittings shall be restrained by MEGALUG series 1100 restraint devices.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: Line and Grade: Lay and maintain to the required lines and grades; with fittings, valves and hydrants at the required locations; and with joints centered and spigots plumb; and with all valve and hydrant stems plumb.
- B. Encasement: Piping under paved drive shall be encased with welded steel pipe casing.
- C. Laying Pipe:
  1. General: Before lowering pipe into trenches, grade the bottom of the ditch so that when pipe is in the ditch it will have a bearing for its entire length. Examine the pipe for defects and clean the inside. After placing pipe in ditch, wipe the bell, gasket, and spigot free from all dirt, sand and foreign material. Apply a film of lubricant to the gasket and spigot. Enter the plain

end into the socket after which force the pipe into the socket until it makes contact with the bottom of the socket.

2. A minimum of five (5) feet horizontal separation shall be used when installing water main or piping within areas of sanitary sewer lines. When the proposed water main or piping is required to cross sewer mains, the contractor shall encase the water main carrier pipe with a continuous pipe (sleeve or casing) of sufficient length, located such that a minimum five (5) foot horizontal separation exists between each end of the casing pipe and the sewer main. Where possible, water main shall be a minimum of 18 inches above the top elevation of the sewer main.
3. No. 12 THW copper locator wire shall be placed in the trench, 12 inches above the water mains and all service piping.
4. Trench Water: At times when pipe laying is not in progress, close the open ends of pipe by approved means, and permit no trench water to enter the pipe.
- D. Cutting Pipe: Cut pipe for inserting valves, fittings or closure pieces in a neat and workmanlike manner without damage to the pipe.
- E. Direction of Laying: Unless otherwise directed, lay pipe with bell ends facing in the direction of laying. For lines on an appreciable slope, face bells upgrade.
- F. Permissible Deflections: Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructing, to plumb stems, or where long radius curves are permitted, deflect as recommended by the manufacturer of the pipe.
- G. Unsuitable Conditions: Lay no pipe in water or when the trench conditions or weather is unsuitable for such work.
- H. Provide ground cover of 3 ft. min.
- I. Setting Appurtenances:
  1. Valves and Fittings: Set gate valves and pipe fittings to new pipe in the manner previously specified for cleaning, laying and jointing pipe.
  2. Valve Boxes: Firmly support cast iron valve boxes and maintain centered and plumb over the wrench nut of the gate valve, with box cover flush with the surface of the finished pavement or at such other level as may be directed.

### **3.2 FIELD QUALITY CONTROL**

- A. Hydrostatic Tests: Pressure During Test: After the pipe has been laid and partially backfilled as specified, pressure test all newly laid pipe, or any valved section of it, in accordance with Local required procedures.

### **3.3 CLEANING AND DISINFECTION**

- A. Clean out and thoroughly flush the water distribution system piping and leave free from foreign materials of any sort prior to sterilization.
- B. Disinfect in accordance with Local required procedures and AWWA Standard C-651, latest edition.

### **END OF SECTION**

## SECTION 02720 - STORM SEWERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### 1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations, and laws of local, municipal, state or federal authorities having jurisdiction.
- B. All locations including total jobsite: All storm drainage shall be in accordance with Local Requirements.

#### 1.3 SUBMITTALS

- A. Submit manufacturer's data, test reports, material certifications as required.

#### 1.4 SITE CONDITIONS

- A. Protection of Existing Utilities: Protect existing power lines, water mains, gas lines, telephone lines and other utilities. Should any functioning underground utilities be uncovered during the Work, advise for determination as to whether or not they are to be removed. Repair any damage to utility lines and restore service to original condition.
- B. Coordination and Scheduling of Work:
  - 1. Coordinate work with earthwork operations to avoid interference. Protect established construction stakes.
  - 2. Establish and maintain center-lines, grades and elevations.
  - 3. Construction of new sewers and drainage systems shall proceed as early in construction program as possible. Maintain adequate drainage of the project area at all times. Prevent flooding of adjacent roads and private properties.
- C. Temporary Drainage: Wherever possible, construct new sewers and inlets to serve the various drainage areas, and place in service. Where this is not possible, provide temporary drainage facilities as required. These may include temporary connections into completed sewers, or such other means as the circumstances may require.

### PART 2 – PRODUCTS

#### 2.1 MATERIALS

- A. Storm Drain Pipe Materials:
  - 1. The Contractor shall have the following options for pipe material:
    - a. Class III reinforced concrete, meeting the requirements of ASTM C76 with tongue and groove joints unless indicated otherwise in the drawings.
    - b. Contech A-2000 PVC Pipe.
    - c. ADS N-12 HDPE
  - 2. Use ductile iron where indicated on the drawings.
- B. French Drains:
  - 1. French drain as indicated on drawings.
  - 2. Corrugated Pipe: Drain shall be equal to Timewell 4" Corrugated HDPE Pipe and Fittings, meeting the requirements of ASTM F405 and F667, along with NRCS Code 606.
    - a. Trench locations, width and depth as indicated on drawings, minimum slope .5%. No soil fill allowed in trench.



- b. Fully line bottom, sides and top of trench with one seamless piece of 4-4.5 ounce nonwoven drainage fabric.
  - c. Drainage pipe and surrounding aggregate are to be installed within the fabric and fabric is to be secured
  - d. Aggregate to be silt-free smooth rounded rock minimum of 2" in diameter, no aggregate is to be under the drainage pipe.
  - e. Trench to be filled as indicated on drawings.
3. Inlet Drains:
- a) Inlet drains and all accessories shall be equal to Nyloplast meeting ASTM F-477, as indicated on the drawings.
- C. Trench Drains:
- 4. Commercial grade shallow trench drain as indicated on drawings.
  - 5. Drain shall be equal to Zurn Model Z883 perma-trench with grates.
    - f. Channels shall be 40" [1016mm] long, 6" [152mm] wide reveal and have a 4" [102mm] throat.
    - g. Modular channel sections shall be made of 0% water absorbent Polyethylene.
    - h. Shall have a positive mechanical connection between channel sections that will not separate during the installation and shall mechanically lock into the concrete surround a minimum of every 10" [254mm].
    - i. Channels shall weigh less than 2.31 lbs.[1.05kg] per linear foot, have a smooth, 2" [51mm] radiused self cleaning bottom with a Manning's coefficient of .009 and neutral 0% built in slope.
    - j. Channels shall have rebar clips standard to secure trench in its final location.
    - k. Shall be provided with HPD (Heel Proof Ductile Slotted) (ADA) grates that lock down with lockdown bars to the channel and is not intended for dynamic traffic loadings. Zurn 5.375" [137mm] wide reveal Ductile Iron Slotted Grate conforming to ASTM specification A536-84, Grade 80-55-06. Ductile Iron grate is rated class B per the DIN EN1433 top load classifications. Supplied in 20" [508mm] nominal lengths
- D. Factory Fabricated Downspout Boots:
- 1. Cast Iron Downspout Boots: contoured interior flow design with no boxed corners, weld seams or choke points; include integral lug slots and stainless steel fasteners.
    - a. Downspoutboots.com, a division of J. R. Hoe & Sons; 101 Ironwood Rd., Middlesboro, KY 40965: [www.downspoutboots.com](http://www.downspoutboots.com).
    - b. Neenah Enterprises, Inc.; 2121 Brooks Avenue, Neenah, WI 54956; Ph. 920.725.7000; [www.groupnei.com](http://www.groupnei.com).
    - c. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
  - 2. Configuration: Offset/O-Series; Angular/A-Series or Ninety/N-Series as required. Inside top bell shall be sized as required to connect to specified metal downspouts. Length shall be sized as required to connect to drain line run to storm sewer as indicated on the drawings.
  - 3. Material: Cast iron; ASTM A48/A48.
  - 4. Finish: Manufacturer's standard powder coat finish.
  - 5. Color: To be selected by Architect from manufacturer's standard range.
  - 6. Accessories:
    - a. Manufacturer's standard stainless steel fasteners for mounting onto building wall

- b. Flexible rubber adapter for connection to drainage pipe
- E. PVC Downspout Boots:
  - 1. Configuration: Inside top bell shall be sized as required to connect to specified metal downspouts. Length shall be sized as required to connect to drain line run to storm sewer as indicated on the drawings.
  - 2. Material: Polyvinyl Chloride (PVC).
  - 3. Finish: Exposed to be painted.
  - 4. Color: To be selected by Architect.
  - 5. Accessories:
    - a. Stainless steel fasteners for mounting onto building wall.
- F. Downspout Nozzle:
  - 1. Jay R. Smith Mfg. Co. Downspout Nozzle Model No.1770. Equal product by Zurn, Mifab or Sioux Chief acceptable.
  - 2. Description: Cast Bronze body and flange.
  - 3. Provide Review Submittals and Product Data: Manufacturer's standard data sheets describing components including materials, dimensions, relationship to adjacent construction, and attachments.
  - 4. Install components in accordance with manufacturer's instructions and approved product data submittals.
  - 5. Set plumb, level, and rigid.
- G. Appurtenance Material:
  - 1. Brick:
    - a. Clay or Shale Brick: Comply with ASTM C 32 for Sewer Brick and Manhole Brick, grade as selected.
    - b. Concrete Masonry Units: Comply with ASTM C 139.
  - 2. Mortar: Comply with ASTM C 270, Type M, for pipe joints and man- hole and inlet brickwork.
  - 3. Concrete:
    - a. Concrete for use in precast concrete catch basins, curb inlets, drop inlets and manholes shall be 3000 psi at age 28 days.
  - 4. Reinforcement: Comply with ASTM A 615.
  - 5. Castings: Comply with ASTM A 48, grey cast-iron.
  - 6. Riprap: Riprap shall be Class I conforming to Section 814 of the State of Alabama Highway Department Standard Specifications.

## **PART 3 – EXECUTION**

### **3.1 INSTALLATION**

- A. Storm Drainage System: Construct drainage structures and appurtenances in accordance with applicable standard drawings and construction details shown on the Drawings.
- B. Lay all pipe in an open trench of dimensions as given below:
  - 1. Lengths of storm drain pipe shown on the Drawings are approximate distances center-to-center of structures. Install pipe based on actual field measurements.

C. Excavation:

1. Excavation is open cut. The top portion of trenches may be excavated as required by the Contractor to any width which will not cause damage to adjacent structures. The lower portion of the trench, to a height of 1 ft. above the top of the pipe shall not exceed 18 in. greater than the pipe dia.
2. All excavation shall be prosecuted in accordance with requirements of OSHA "Safety and Health Regulations for Construction".
3. When sheeting or shoring is used, widths may be increased by the thickness of the timbers. All protective measures required are the responsibility of the Contractor and shall be provided at the Contractor's expense.
4. Carefully shape the bottom of trenches to conform to and support the lower 1/4 of the periphery of the pipe barrel. At the Contractor's option, trenches may be excavated slightly over depth, and then the pipe bed may be constructed of approved granular material, thoroughly tamped and carefully shaped to conform to and support the lower 1/4 of the periphery of the pipe barrel. Where rock is encountered, remove to a depth of 6 in. below the pipe and replace with an approved granular material.
5. Where suitable material, such as muck, is encountered at or below invert elevation during excavation, remove and replace with suitable material, or stabilize by the addition of a granular material.

D. Pipe Laying:

1. Proceed upgrade where practicable. Lay pipe shall true to grade and line with a straight and uniform invert. Do not lay pipe in a wet or muddy trench. Dewater trenches as required with firm, smooth and properly shaped bed as specified.
2. Lay corrugated metal pipe so that if invert paving has been damaged, repair with an asphaltic compound to the satisfaction of the Engineer.
3. Joints for reinforced concrete pipe shall be with sand-cement grout.

E. Backfilling:

1. Backfill with selected material, free from rock larger than 2 in. in size, or debris.
2. Carefully place backfill and tamp around and over the pipe to avoid displacement of the pipe or damage to the joints.
3. Place all backfill in 6 in. lifts and compact as required in EARTHWORK Section. Compaction methods shall be at the Contractor's option as long as the desired results are obtained; otherwise, the Architect may order changes in methods or equipment.

F. Appurtenances and Drainage Structures:

1. Furnish and install drainage structures as shown in detail on the Drawings. Install shaped inverts.
2. Fill all mortar joints full. Tool all joints.
3. Cut and grind all pipe, where cut at face of structure wall, smooth with the face of the wall. Pack full all joints around pipe and structure wall at the face of the wall with mortar.
4. Clean bottom of drainage structures of all debris, and wipe walls clean of mortar as work progresses.
5. Construct catch basin tops true to line and grade, and slope continuous with gutter.
6. Install cast iron steps in all structures over 4 ft. deep, installed 15 in. o.c. in a vertical direction. Cast iron steps and manhole rings and covers shall meet ASTM A 48.
7. Construct junction boxes with bottom as shown in details for drop inlets, catch basins or other structures. Construct tops to accommodate a standard manhole ring, and adjust over to grade.

8. Where indicated in the Storm Structure Schedule, drainage basins by Contech or Nyloplast may be used.

### **3.2 ADJUSTING AND CLEANING**

- A. At completion, remove all excess materials, debris, etc. resultant from operations of this Section of Work.
- B. Leave drainage systems clean and free from mud or debris of any kind. When looked through, each line between structures shall show a full circle of light; otherwise the Contractor shall be required to remove and replace the defective portion of the work, at the Contractor's expense.

**END OF SECTION**

## **SECTION 02730 - SANITARY SEWERS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 QUALITY ASSURANCE**

- A. Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction.
- B. Sanitary sewer construction is subject to review and acceptance by the Local Sewer Department and shall meet their requirements.

#### **1.3 SITE CONDITIONS**

- A. Coordinate sanitary sewer construction with grading operations to avoid deep trench conditions insofar as possible.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- A. Pipe: Type as shown Drawings.
  - 1. PVC Pipe:
    - a. Gravity Pipe – Plastic pipe for gravity sewers, stacks and laterals, and fittings shall be unplasticized polyvinyl chloride (PVC), meeting or exceeding ASTM Specification D3034, latest edition, Classification SDR 35.
    - b. Force Main Pipe – PVC pipe for force mains shall conform to the requirements of ASTM D2241 for pressure pipe or AWWA C900. Pipe shall be Class 150 with a Standard Dimension Ratio of 18 or heavier.
    - c. All sanitary sewer PVC pipe shall be either green or brown in color.
- B. Appurtenances:
  - 1. Manholes: Precast concrete units conforming to ASTM 478.
  - 2. Castings: Grey cast iron conforming to ASTM A 48.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Trenching and Excavation:
  - 1. Excavate in open trench to the width, depth and in the direction necessary for the proper construction of the pipe sewer according to the Drawing.
  - 2. Shape the bottom of the trench so as to conform as nearly as possible to the outside of the pipe, particular care being taken to recess the bottom of the trench in such a manner as to relieve the bell of the pipe of all load.
  - 3. Build pipe sewers in a trench, the width of which at the top of the pipe shall not exceed the external dia. of the bell of the pipe, plus 12 in. each side, unless otherwise directed by the Engineer, but in no case less than 24 in. in width.
  - 4. All excavation shall be performed in accordance with requirements of OSHA "Safety and Health Regulations for Construction".

B. Backfilling:

1. The sanitary sewer pipe shall be bedded in a crushed stone bench bottom installed to a minimum depth below the pipe of six (6) inches. After the pipe is installed, the trench shall be backfilled with crushed stone to a depth of one-half the pipe diameter for depths of cut of 12 feet or less. For depths of cut greater than 12 feet the pipe shall be backfilled with crushed stone to a height of 6" above the top of the pipe.
2. No. 12 THW copper locator wire shall be placed in the trench, 12 inches above the sewer mains and all sewer service piping.
3. Backfill all trenches and excavation immediately after the pipes are laid therein unless other protection for the pipe line is directed. The backfilling material shall be selected and deposited with special reference to the future safety of the pipes. Solidly tamp clean earth, sand or rock dust about the pipe up to the level of 6 in. above the top of the pipe, and carefully deposit in uniform layers, each layer solidly tamped or rammed with proper tools so as not to disturb or injure the pipe line. Mechanical means may be permitted for backfilling, provided the equipment meets the approval of the Architect. Faithfully ram or tamp the remainder of the backfilling of the trenches in layers of not more than 6 in. in depth with either approved mechanical or hand tamps. Compaction shall conform to the requirements of the EARTHWORK Section.
4. All backfilling material shall be free from rock, trash and debris.

C. Laying Pipe

1. Lay pipe with joints close and even, butting all around, special care being taken that there is no sagging at the hub, and that a true surface is given to the invert throughout the entire length of the sewer.
2. Water in Trenches: Do not use sewers for draining water from ditch. Provide and operate pumps, if necessary, to remove water from trench while pipe is being laid and joints made.

D. Jointing Pipe:

1. In jointing gasket pipe, clean both the bell and the spigot before the gasket is applied. Use the proper size gasket for each size of pipe, and lubricate only with a lubricant recommended by the manufacturer of the pipe. Insert the spigot end in the bell the proper distance, and take care to see that the pipe remains in this position.
2. Clean all joint material that may be left on the inside, and leave the pipe clean and smooth throughout. At every third pipe, fill around immediately after being properly placed and jointed to prevent the moving of joints.
3. Free the interior of the pipe of all dirt and superfluous material of every description, as the work proceeds.

E. Manholes:

1. Manholes shall be precast concrete conforming to ASTM 478. Shape inverts and build of concrete.

**3.2 FIELD QUALITY CONTROL**

- A. Testing: Perform Required Test as required by Local Authority.

**3.3 ADJUSTING AND CLEANING**

- A. Clean and clear sanitary sewers of materials of all kind.

**END OF SECTION**

**SECTION 02789 – SYNTHETIC TURF AND DRAINAGE FIELD –  
(BATTING CAGE)**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

**1.2 SCOPE OF WORK**

- A. The General Contractor shall prepare the field to sub-grade level (containing any electrical conduit, boxes, irrigation piping, concrete pads, etc.) prior to the installation of the drainage field and surface materials specified herein. This Contractor shall coordinate all work with the General Contractor prior to installation.
- B. It shall be the responsibility of the turf contractor to provide all labor, materials, equipment and tools necessary for the complete installation of a synthetic grass system, with a specially formulated resilient infill component and a porous vertical drainage stone base. The tufted infill system and the porous vertical drainage system shall consist of, but not necessarily be limited to, the following:
  - 1. A complete synthetic grass system, consisting of a nominal 2" minimum, 100% Parallel Slit Film fibers, spined tufted into a primary backing with a secondary backing. The backing will be perforated to ensure positive drainage.
  - 2. A resilient infill system consisting of rubber granules and sand, specifically designed to provide the feel, performance, and safety of an optimally maintained natural grass surface. The finished surface shall have the planarity and subtle undulations normally associated with typical natural grass athletic fields.
  - 3. A vertical draining field base consisting of a compacted layer of Open Graded Stone (OGS) with a under-drain system installed above a geo-textile membrane. The end of the drains are placed directly into the perimeter trench system containing a properly sized perforated pipe covered with free draining stone that discharges into a designated storm water outlet.
  - 4. The artificial turf shall be specifically designed, manufactured and installed for the intended sports and events. Typically sports include, but are not limited to football.
  - 5. Acceptance of prepared sub-base.
  - 6. Coordination with related trades to ensure a complete, integrated, and timely installation: Aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.
  - 7. All bidders and/or turf contractors must directly employ the installers of the synthetic grass, layered infield systems and base. Subcontractors shall NOT be acceptable for the synthetic grass, infill system and or base installation.

**1.3 REFERENCE STANDARDS**

- A. FM Factory Mutual
  - 1. P7825 - Approval Guide; Factory Mutual Research Corporation; current edition
- B. ASTM – American Society for Testing and Materials.
  - 1. D1577 - Standard Test Method for Linear Density of Textile Fiber
  - 2. D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
  - 3. D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Covering
  - 4. D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
  - 5. D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)

6. F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
7. D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity
8. D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
9. F355 - Standard Test Method for Shock-Absorbing Properties of Playing Surfaces.
10. F2117 – Standard Test Method for Vertical Rebound Characteristics of Sports Surface Systems: Acoustical Measurements (Soccer)
11. BS7044, Section 2.2 Methods for Determination of Person/Surface Interaction Method 1: Determination of Traction (Rotational Resistance)
12. F1551-03 Suffix: DIN 18-035, Part 6: Water Permeability of Synthetic Turf Systems
13. ASTM F355-10, Procedure A: Testing Services Inc test number TSI 1202

#### **1.4 SUBMITTALS**

##### **A. Shop Drawings:**

1. Indicate field layout; field marking plan and details for the specified sports; i.e., NCAA Baseball / Softball; roll/seaming layout; methods of attachment, field openings and perimeter conditions.
2. Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage.
3. Provide joint submission with related trades when requested by Architect.

##### **B. Product Data:**

1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
3. Submit name and address of the cryogenic infill supplier/manufacturer
4. Submit data in sufficient detail to indicate compliance with the contract documents.
5. Submit manufacturer's instructions for installation.
6. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.

##### **C. Samples:**

1. Submit samples, 2 - 9 x 12 inches, illustrating details of finished product in amounts as required by General Requirements, or as requested by Architect.

##### **D. Product Certification:**

1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
2. Submit test results indicating compliance with Reference Standards.

##### **E. Project Record Documents:** Record actual locations of seams, drains and other pertinent information in accordance with Specifications, General Requirements.

##### **F. List of existing installations:** Submit list including respective Owner's representative and telephone number.

##### **G. Warranties:** Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.

##### **H. Submit Bills of Lading/Material Delivery Receipts** for synthetic turf infill materials. Bills of lading shall bear the name of the project/delivery address, quantity of materials delivered,



source/location of origin of infill materials and/or manufacturer, and date of delivery.

- I. Testing Certification: Submit certified copies of independent (third-party) laboratory reports on ASTM testing:
  1. Pile Height, Face Weight & Total Fabric Weight, ASTM D5848.
  2. Primary & Secondary Backing Weights, ASTM D5848.
  3. Tuft Bind, ASTM D1335.
  4. Grab Tear Strength, ASTM D1682 or D5034.
  5. Water Permeability, ASTM D4491

## **1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The turf contractor and/or the turf manufacturer:
  1. Shall be experienced in the manufacture and installation of specified type of infilled slit-film grass system for a minimum of three years. This includes use of a slit-film fiber, backing, the backing coating, and the installation method.
  2. The manufacturer shall own and operate its own manufacturing plant. Manufacturing the fiber, tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer.
  3. Shall have 100 fields in play for at least two years with a slit-film fiber. Fields shall be 65,000 ft<sup>2</sup> or more
  4. Shall have a minimum of 10 fields that are at least 8 years old, which is equal to the respective warranty period, with the same infill system.
  5. Shall have a minimum of 1 installation in the State of AL.
  6. Shall have a minimum of 25 installations in North America, each of 65,000 ft<sup>2</sup> or more. Fields shall be 65,000 ft<sup>2</sup> or more of the specified infill material and a slit-film fiber.
  7. The fiber and turf carpet being proposed must have a minimum documented Fiber Performance Index of at least 75.
  8. Shall provide third party certification confirming minimum requirement of 9 lbs tuft bind.
- B. Installer: Company shall specialize in performing the work of this section. The Contractor shall provide competent workmen skilled in this specific type of synthetic grass installation.
- C. The designated Supervisory Personnel on the project shall be certified, in writing by the turf manufacturer, as competent in the installation of specified slit-film material, including sewing seams and proper installation of the infill mixture.
- D. Installer shall be certified by the manufacturer and licensed.
- E. The installer supervisor shall have a minimum of 5 years experience as either a construction manager or a supervisor of synthetic turf installations
- F. Pre-Installation Conference: Conduct conference at project site at time to be determined by Architect. Review methods and procedures related to installation including, but not limited to, the following:
  1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
  2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner's representative, and the Architect.
  3. The Contractor shall verify special conditions required for the installation of the system.
  4. The Contractor shall notify the Architect of any discrepancies.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Prevent contact with materials that may cause dysfunction.
- B. Deliver and store components with labels intact and legible.
- C. Store materials/components in a safe place, under cover, and elevated above grade.
- D. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.
- E. Inspect all delivered materials and products to ensure they are undamaged and in good condition.
- F. Comply with manufacturer's recommendations.

## **1.7 SEQUENCING AND SCHEDULING**

- A. Coordinate the Work with installation of work of related trades as the Work proceeds.
- B. Sequence the Work in order to prevent deterioration of installed system.

## **1.8 WARRANTY AND GUARANTEE**

- A. The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of substantial completion. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; pre paid for the entire 8 year term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an "AM Best" A rated carrier and must reflect the following values:
  - 1. Pre-Paid 8-year insured warranty.
  - 2. Insured Warranty Coverage must be provided in the form of 1 single policy
  - 3. Maximum per claim coverage amount of \$15,000,000.
  - 4. Minimum of fifteen million dollar (\$15,000,000) annual aggregate
  - 5. Must cover full 100% replacement value of total square footage installed, minimum of \$7.00 per sq ft. (in case of complete product failure, which will include removal and disposal of the existing surface)
  - 6. Policies that include self insurance or self retention clauses shall not be considered.
  - 7. Policy cannot include any form of deductible amount.
  - 8. Sample policy must be provided at time of bid to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.
- B. The artificial grass system must maintain a G-max of less than 200 for the life of the Warranty as per ASTM F1936.

## **1.9 MAINTENANCE SERVICE**

- A. Contractor shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.
- B. Manufacturer must provide maintenance guidelines and a maintenance video to the facility maintenance staff.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
- B. FieldTurf; [www.fieldturf.com](http://www.fieldturf.com); Craig Yancey, Regional Sales Manager, (205)908-5608; Calhoun, Georgia. (Basis of Design)
- C. AstroTurf; [www.astroturf.com](http://www.astroturf.com); Contact: Zack Riddleberger (336)238-9060; email:zriddleberger@astroturf.com
- D. Sprinturf, LLC; [www.sprinturf.com](http://www.sprinturf.com); Charlie Welsh, (651)239-0400; Daniel Island, SC 29492.
- E. Shaw Sports Turf; Legion; [www.shawsportsturf.com](http://www.shawsportsturf.com); 185 South Industrial Boulevard, Calhoun, Georgia, 30701; Contact Wynn Vinson: Phone: 601.416.4767; Email: wynn.vinson@shawinc.com.
- F. Hellas Construction; [www.hellasconstruction.com](http://www.hellasconstruction.com); [www.matrix-turf.com](http://www.matrix-turf.com); 12710 Research Blvd. Suite 240, Austin, TX, 78759.
- G. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than ten (10) days prior to scheduled bid opening. Additionally, submit for approval a 12 inch by 12-inch sample, detailed specifications, and a complete material testing of the synthetic grass to be used on this project. The Architect will notify all material manufactures in writing of specification and product approval, prior to the bid opening. All manufactures shall include a sample manufacturer's warranty with request for approval.

### 2.2 MATERIALS AND PRODUCTS

- A. Double Play Classic by FieldTurf USA Inc.
  - 1. Artificial grass system materials shall consist of the following:
  - 2. All designs, markings, layouts, and materials shall conform to all currently applicable National Federation or NCAA rules and other standards that may apply to this type of synthetic grass installation.
  - 3. Carpet made of slit-film polyethylene fibers tufted into a fibrous, non-perforated, porous backing.
  - 4. Infill: Controlled mixture of graded sand and cryogenic rubber crumb that partially covers the carpet.
  - 5. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film.
  - 6. The installed artificial grass slit-film shall have the following properties:

a.	Standard	Property	Specification
	ASTM D1577	Fiber Denier	10,800
		HALS UV Stabilizer	10,000ppm
	ASTM D5823	Pile Height	2"
	ASTM D5793	Stitch Gauge	½ - ¾"
	ASTM D5848	Pile Weight	30oz/square yard
	ASTM D5848	Primary Backing	7+oz/square yard
	ASTM D5848	Secondary Backing	14+oz/square yard
	ASTM D5848	Total Weight	51+oz/square yard
	ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
	ASTM D5034	Grab Tear (Width)	200 lbs/force

ASTM D5034	Grab Tear (Length)	200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.25 inches
	Sand Infill Component	3.65 lbs/square foot
	Cryogenic Rubber Infill Component	2.6lbs/square foot
	Total Product Weight	951oz/square yard

7. Carpet shall consist of slit-film fibers tufted into a primary backing with a secondary backing.
8. Carpet Rolls shall be 15' wide rolls.
9. Rolls shall be long enough to go from field sideline to sideline.
10. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.
11. Backing:
  - a. Primary backing shall be a double-layered polypropylene fabric
  - b. Perforated (with punched holes) backed carpet are unacceptable.
12. Fiber shall be 10,800 denier, low friction, and UV-resistant fiber measuring not less than 2 inches high.
13. Systems with less than 2 inch fibers are unacceptable.
14. Infill materials shall be approved by the manufacturer.
15. Infill shall consist of a resilient granular system, comprising selected and graded sand and cryogenically hammer-milled SBR rubber crumb.
16. Artificial Grass products without cryogenically processed rubber or a finish application of straight rubber cryogenically processed will not be acceptable.
17. The sand component of the infill must represent a minimum of 51% or more of the total infill, by weight.
18. The sand infill will comply within the following characteristics:
  - a. Average Particle size between 20 and 30 mesh [calculated based on summing the midpoint of sieve pan fractions times the % retained on given screen fractions]
  - b. Average Particle shape > 0.4 on the Krumbein scale
  - c. Particle structure predominantly single grain
  - d. Produce < 0.4%, -50M in API crush test at 80psig
19. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.
20. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.
21. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

## 2.3 QUALITY CONTROL IN MANUFACTURING

- A. The manufacturer shall own and operate its own manufacturing plant. Manufacturing the fiber, tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer. Outsourcing of any of these major processes is unacceptable.
- B. The manufacturer shall have full-time certified in-house inspectors at their manufacturing plant that are experts with industry standards.
- C. Primary backing shall be inspected by the manufacturer's full-time certified in-house inspectors

before tufting begins.

- D. The manufacturer's full-time in-house certified inspectors shall verify "pick count", yarn density in relation to the backing, to ensure the accurate amount of face yarn per square inch.
- E. The manufacturer's full-time, in-house, certified inspectors shall perform turf inspections at all levels of production including during the tufting process and at the final stages before the turf is loaded onto the truck for delivery.
- F. The manufacturer shall have its own, in-house laboratory where samples of turf are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.

## **2.4 QUALITY CONTROL IN FIBER MANUFACTURING**

- A. Synthetic turf fiber must perform in a uniform manner or manufacturer quality control issues in the extrusion processes will be suspected. Linear Low Density Polyethylene Polymer ("LLDPE") and batch additives obtained from a reputable manufacturer are required to manufacture superior quality slit-film yarn. The master batch formula must include a UV stabilizer package added to its polymer base.
- B. The LLDPE used to make the artificial grass fiber needs to be a "C6" LLDPE which contains 6 carbon atoms and 12 hydrogen atoms; A C6-based LLDPE produces strong and resilient artificial grass fibers over prolonged periods and thus should provide the basis for long term performance of the system.
- C. Adequate UV protection is essential to the long-term durability of any artificial grass fiber. Typically, stabilizer packages for polyethylene fibers have three components that protect the fibers from degradation: (1) primary antioxidants; (2) secondary antioxidants; and (3) UV stabilizers (i.e., hindered amine light stabilizers ("HALS")). HALS are a particularly important aspect of the stabilizer package. A typical HALS concentration is 10,000 ppm. More developed HALS molecules are methyl stabilized to prevent from degradation.
- D. Streaking refers to color variation in a field due to different degrees of fiber relaxation. Fiber in one row stands up, while fiber in an adjacent row lies flat. The inconsistent relaxation causes differences in the reflection of light off of the fiber, and results in the field having a streaked or striped appearance. Adequate UV protection minimizes the appearance of streaking and other visual flaws during the warranty period.

## **2.5 FIELD GROOMER & SWEEPER**

- A. **Contractor shall furnish a field groomer and sweeper as part of the work.**
  - 1. Field Groomer and Field Sweeper shall be by the manufacture of the turf system.
  - 2. Field Sweeper shall include a towing attachment compatible with a field utility vehicle.

## **2.6 VERTICAL DRAINAGE BASE MATERIALS**

- A. Excavation: Existing natural grass field shall be excavated to the depth as shown on the grading plan. The sub grade shall be shaped to achieve a .5% (one half of one percent) slope from the center of the field to each sideline in order to mirror the grade of the finished synthetic turf surface. The sub grade shall also be compacted and proof rolled to a minimum of a 95% compaction rate.
- B. Geotextile Filter Fabric:
  - 1. Non-woven polypropylene geotextile fabric shall be chemically and biologically inert and shall be equivalent to Mirafi, Mirafi Inc., Pendergrass, GA (888) 795-0808.
    - a. Mirafi 140N or equal for Permeable applications
    - b. Mirafi 500X or equal for Silty/Clayey Subgrades with fines content <35% and a PI<20.
    - c. 16 Mil Woven Coated Polyethylene line for Impervious applications over moisture sensitive soils.
    - d. Liner Selection to be made by Geotechnical Engineer of Record.

- C. Drainage Pipe: A network of perforated HDPE highway grade drainage pipe (1" x 12" flat panel pipe) shall be installed under a 6" layer of free draining base aggregate. The drainage pipe will be installed in a herringbone pattern every 15 feet on center and will be connected to perimeter collector lines. See Civil Drawings for complete drainage field requirements.

1. ADS AdvanEdge, 800-821-6710 or Hydraway 2000.
2. 1 inch by 12-inch flat drain.
3. 8-inch diameter perforated collector drainpipe.

D. Stone Base Courses:

1. The following gradation of stone is proven and recommended when available in the vicinity of the project. The Base Contractor is required to focus on achieving the planarity, porosity and compaction requirements to provide a sound crushed stone base for synthetic turf installation.
2. The free-draining base aggregate base layer shall consist of a consistent depth of open graded material. Base drainage aggregate used must achieve a 95% minimum overall compaction rate. Material shall be similar to the ALDOT # 57 classification material. The open graded aggregate material shall conform to the following criteria:

Base Aggregate:	Open Graded Stone (OGS)	
	Weight Passing	Approximate Percentage Passing
2" Sieve	36.99	100.0%
3/4" Sieve	34.04	92.0%
3/8" Sieve	21.5	58.0%
#4 Sieve	9.34	25.0%
#16 Sieve	203.3 grams	9.2%

3. The choker material shall be a clean washed screenings meeting the Turf Contractor's approval. Material shall be similar to the ALDOT # 89 classification material.

Choker Material:	(Porous Stone Sand)	
	Weight Passing	Approximate Percentage Passing
3/8" Sieve	579.3 grams	100.0%
#4 Sieve	561.5 grams	96.8%
#8 Sieve	420.0 grams	72.0%
#16 Sieve	260.1 grams	45.0%
#30 Sieve	148.8 grams	25.0%
#50 Sieve	74.9 grams	13.0%
#100 Sieve	29.9 grams	5.0%
#200 Sieve	14.7 grams	2.0%

## **PART 3 – EXECUTION**

### **3.1 VERTICALLY DRAINING BASE**

- A. The synthetic turf Base Contractor shall strictly adhere to the installation procedures outlined under this section. Any variance from these requirements must be accepted in writing, by the Turf Contractor's on-site representative, and submitted to the Architect/Owner, verifying that the changes do not in any way affect the warranty.
- B. Install geotextile fabric over excavated and prepared sub-grade in accordance Architect's recommendations. Provide a 36" minimum overlap at all seams. Fabric shall first be installed in the drainage trenches prior to installation of perimeter collector lines. After backfilling of all trenches is complete, the entire field shall be covered with fabric prior to the base aggregate application.
- C. Trenching, Drainage Pipe Installation and Backfilling: All piping shall be as specified and connected by couplers, plugs etc. Design of the drainage system for the Football Field shall be by this Contractor and accepted by the manufacture of the synthetic grass system prior to installation.
  - 1. The base grade shall be shaped to mirror the finished grade and approved by the Architect and/or Owner's Representative. The Base Contractor shall begin layout and trenching for the drainage network as indicated on the drainage plan and all details that apply. Collector lines shall be installed before lateral lines and shall begin with the deepest elevations. Collector lines shall be connected to discharge outlet at the onset of operations. Trenching progress shall work upward in elevation to allow for immediate discharge of water from the entire field in the event of a rainfall.
  - 2. No trenches, with or without pipe, shall be permitted, to remain unfilled overnight and/or while crews are not progressively working on site.
  - 3. All perimeter trenches must be dug in accordance with the field drainage plan details.
  - 4. After all collector and lateral lines have been installed, the Base Contractor shall repair any sub grade undulations prior to installing geotextile fabric.
- D. Concrete Header Curb and Pressure Treated Wood Turf Nailer: The synthetic turf perimeter fastening structure shall be installed before the drainage aggregate.
  - 1. The General Contractor shall furnish and install a 6" x 12" concrete header curb around the entire inside of the track at the football field, top of header of the curb shall be flush with track surface. Curb shall be installed in accordance with the manufactures requirements. The foundation of the concrete header curb shall be a compacted free draining aggregate. Future water entering the foundation shall have a free draining path directly to the perimeter collector pipe.
  - 2. Install a pressure treated wood 2" x 4" nailer. Pressure treated wood nailer shall be set below top of the curb as specified by means of a Tapcon or ramset every 12 inches. This shall be the responsibility of the Base Contractor.
- E. Base Drainage Aggregate: The installation of the base drainage aggregate shall only begin after the drainage pipe installation has been inspected and approved by Architect/Owner's Representative. Installation of the Free Draining Base Aggregate shall follow procedures that protect the base grade soils and drainage pipe. The drainage pipe network and its existing elevations shall not be disrupted through ground pressures from trucks, dozers or by any other means.
  - 1. The base grade subsoil shall be dry before undertaking the placement of base aggregate.
  - 2. Delivery trucks shall enter the field only from the designated entrance point. Base course stone shall be dumped closest to the entrance first and continuously worked towards the furthest point of the field. Extreme care must be taken not to disturb sub grade or drainage network.

3. Track-type dozers shall push out the stone from behind the pile onto and toward the field center. Dozers shall only traffic the aggregate they are spreading.
  4. Bulldozer blades shall be equipped with a laser-guided hydraulic system. Care shall be taken not to disturb or contact the base grade soils with the dozer blades or tracks. All equipment trafficking over the drainage aggregate shall insure there is a minimum depth of 4" of aggregate between the geotextile fabric and the dozer track ground contact position.
  5. When the aggregate spreading is completed, the surface shall be further-firmed by a 5-ton roller. Static vibration shall not be part of this process.
  6. The stone shall be left firm, but not over-compacted as to protect the porosity and drainage capabilities of the aggregate profile.
  7. After the drainage stone has been uniformly spread throughout the surface, the surface shall receive a final laser finished grade. This process shall be accomplished using a turf-type tractor, or lightweight grader, equipped with high flotation tires and a hydraulically controlled laser blade.
  8. The free-draining base course must be installed to a depth of 5 inches and shall be independently tested for an overall compaction rate of 95% proctor.
- F. Choker Levels: The base drainage stone final elevations shall mirror the proposed choker layer final grade material. Care shall be taken not to allow the coarser aggregate to surface into the profile or finished grade of the choker layer.
1. The choker layer shall be applied using high flotation grading equipment. The choker material shall be evenly spread throughout the proposed field surface to the final pre-pad or pre-turf elevations.
  2. After the choker material has been uniformly spread throughout the surface by the described method, the surface shall receive a final laser finish grade. This process shall be accomplished using a turf-type tractor, or lightweight grader, equipped with high flotation tires and a hydraulically controlled laser blade.
  3. Care shall be taken throughout the installation not to force the choker material into the porosity of the base aggregate below.
  4. Final choke layer must be graded by means of a laser within 0 to 1/2 inch from design grade. The finished surface tolerance must not exceed 1/4 inch over 10 feet in all directions. Base Contractor must provide a topographical survey with a minimum of 200 shots demonstrating finished grade meets all written requirements.
  5. Final layer of stone must be installed at a depth of one (1) inch. Finished aggregate base must be proof-rolled by means of 2- to 5-ton roller. The finished aggregate base must achieve an overall compaction rate of 95% proctor in accordance with ASTM D1557. It shall also be flush with top of pressure treated wood nailer.
  6. The Contractor is required to stringline the entire field every five feet to identify high and low spots. And identified high and low spots must be eliminated prior to installation of the synthetic turf.
- G. Base Acceptance: The Architect and/or Owner's Representative and Turf Contractor must jointly approve the base before turf installation can begin.
- H. Verify that all sub-base leveling is complete prior to installation.
- I. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.
1. Acceptance is dependent upon the Contractors test results indicating compaction and planarity are in compliance with manufacturer's specifications.
  2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- J. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified



Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2" from design grade.

- K. Correct conditions detrimental to timely and proper completion of Work.
- L. Do not proceed until unsatisfactory conditions are corrected.
- M. Beginning of installation means acceptance of existing conditions.

### **3.2 EXAMINATION**

- A. Verify that all sub-base leveling is complete prior to installation.
- B. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.
- C. Acceptance is dependent upon the Owner's test results indicating compaction and planarity are in compliance with manufacturer's specifications.
- D. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- E. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2" from design grade.
- F. Correct conditions detrimental to timely and proper completion of Work.
- G. Do not proceed until unsatisfactory conditions are corrected.
- H. Beginning of installation means acceptance of existing conditions.

### **3.3 PREPARATION**

- A. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.
- B. Sub-base acceptance shall be subject to receipt of test results (by others) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.
- C. Dimensions of the field and locations for markings shall be measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.
- D. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the slit-film turf. A sub base that drains poorly is an unacceptable substrate

### **3.4 INSTALLATION – GENERAL**

- A. The installation shall be performed in full compliance with approved Shop Drawings.
- B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.
- C. the designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.
- D. Designs, markings, layouts, and materials shall conform to all currently applicable National Collegiate Athletic Association rules, NFHS rules, and/or other rules or standards that may apply to this type of synthetic grass installation. Designs, markings and layouts shall first be approved by the Architect or Owner in the form of final shop drawings. All markings will be in full compliance with final shop drawings.

### **3.5 INSTALLATION**

- A. Install at location(s) indicated, to comply with final shop drawings, Manufacturers / installer's instructions.
- B. The Contractor shall strictly adhere to specified procedures. Any variance from these requirements shall be provided in writing, by the manufacturer's on-site representative, and

submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with the manufacturer's standard procedures.

- C. Carpet rolls shall be installed directly over the properly prepared aggregate base. Extreme care shall be taken to avoid disturbing the aggregate base, both in regard to compaction and planarity.
- D. Repair and properly compact any disturbed areas of the aggregate base as recommended by manufacturer
- E. Full width rolls shall be laid out across the field.
- F. Turf shall be of sufficient length to permit full cross-field installation from sideline to sideline.
- G. No cross seams will be allowed in the main playing area between the sidelines.
- H. Each roll shall be attached to the next roll utilizing standard state-of-the-art sewing procedures.
- I. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing surface.
- J. Artificial turf panel seams shall be sewn. Seams secured by other means including gluing are unacceptable. Installation shall be 99% sewn.
- K. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications.
- L. Seams shall be flat, tight, and permanent with no separation or fraying.
- M. In the case of all lines and logos, turf carpet/field fibers must be sheared to the backing (do not cut the backing) and adhered using hot melt adhesives.
- N. Infill Materials:
  - 1. Infill materials shall be applied in numerous thin lifts. The turf shall be brushed as the mixture is applied.
  - 2. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The Infill installation consists of a mixture of the sand and the cryogenically processed rubber. Infill density shall consist of 3.65 pounds of sand and at least 2.6 pounds of rubber per square foot. The Infill shall be placed so that there is a void of a minimum of  $\frac{3}{4}$ " to the top of the fibers.
  - 3. Non-tufted or inlaid lines and markings shall be painted in accordance with turf and paint manufacturers' recommendations. Number of applications will be dependent upon installation and field conditions.
  - 4. Synthetic turf shall be attached to the perimeter edge detail in accordance with the manufacturer's standard procedures.
  - 5. Upon completion of installation, the finished field shall be inspected by the installation crew and an installation supervisor.

### **3.6 FIELD MARKINGS**

- A. Field markings shall be installed in accordance with approved shop drawings. If football is designated as the primary sport, all five yard lines will be tufted-in.
- B. Balance of sports markings will be inlaid in accordance with the Drawings.

### **3.7 ADJUSTMENT AND CLEANING**

- A. Do not permit traffic over unprotected surface.
- B. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- C. All usable remnants of new material shall become the property of the Owner.
- D. The Contractor shall keep the area clean throughout the project and clear of debris.

- E. Surfaces, recesses, enclosures, and related spaces shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

### **3.8 PROTECTION**

- A. Protect installation throughout construction process until date of final completion.

**END OF SECTION**

## SECTION 02790 – SYNTHETIC TURF AND DRAINAGE FIELD

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

#### 1.2 SCOPE OF WORK

- A. **The Owner shall demo the existing field to sub-grade level (containing any electrical conduit, boxes, irrigation piping, concrete pads, etc.) prior to the installation of the drainage field and surface materials specified herein. This Contractor shall coordinate all work with the Owner prior to installation.**
- B. The field turf at the Football Stadium shall be furnished with a drainage field as indicated on the drawings.
- C. The General Contractor shall be responsible for **all** quantities of all materials for the furnishing and installation of the synthetic turf system. As stated in the General Conditions the General Contractor shall field verify all existing conditions prior to submitting his proposal. Therefore, the actual quantity of the coverage area for the field turf shall be the responsibility of the General Contractor.
- D. It shall be the responsibility of the turf contractor to provide all labor, materials, equipment and tools necessary for the complete installation of a synthetic grass system, with a specially formulated resilient infill component and a porous vertical drainage stone base. The tufted infill system and the porous vertical drainage system shall consist of, but not necessarily be limited to, the following:
  - 1. A complete synthetic grass system, consisting of a nominal 2-1/4" to 2-1/2" minimum, helix shaped monofilament fibers tufted into a primary backing with a secondary backing. The backing will be perforated to ensure positive drainage.
  - 2. A resilient infill system consisting of rubber granules and sand, specifically designed to provide the feel, performance, and safety of an optimally maintained natural grass surface. The finished surface shall have the planarity and subtle undulations normally associated with typical natural grass athletic fields/soccer.
  - 3. A vertical draining field base consisting of a compacted layer of Open Graded Stone (OGS) with a under-drain system installed above a geo-textile membrane. The end of the drains are placed directly into the perimeter trench system containing a properly sized perforated pipe covered with free draining stone that discharges into a designated storm water outlet.
  - 4. The artificial turf shall be specifically designed, manufactured and installed for the intended sports and events. Typically sports include but are not limited to football.
  - 5. Acceptance of prepared sub-base.
  - 6. Coordination with related trades to ensure a complete, integrated, and timely installation: Aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.
  - 7. All bidders and/or turf contractors must directly employ the installers of the synthetic grass, layered infield systems and base. Subcontractors shall NOT be acceptable for the synthetic grass, infill system and or base installation.

#### 1.3 REFERENCE STANDARDS

- A. FM Factory Mutual
- B. P7825 - Approval Guide; Factory Mutual Research Corporation; current edition
- C. ASTM – American Society for Testing and Materials.
- D. D1577 - Standard Test Method for Linear Density of Textile Fiber

- E. D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
- F. D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Covering
- G. D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
- H. D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)
- I. F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
- J. D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- K. D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
- L. F355 - Standard Test Method for Shock-Absorbing Properties of Playing Surfaces.
- M. F1936 - Standard Test Method for Shock-Absorbing Properties of North American Football Field Playing Systems as Measured in the Field
- N. D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- O. ASTM F355-10, Procedure A: Testing Services Inc test number TSI 1202

#### **1.4 SUBMITTALS**

- A. Substitutions: Other products are acceptable if in compliance with all requirements of
- B. these specifications. Submit alternate products to Architect for approval prior to bidding
- C. in accordance
- D. Product Substitution Procedures:
  - 1. Provide substantiation that proposed system does not violate any other manufacturer's patents, patents allowed or patents pending.
  - 2. Provide a sample copy of insured, non-prorated warranty and insurance policy information.
- E. Comply with Submittals Procedures. Submit for approval prior to fabrication.
- F. Prior to order of materials, the Turf Contractor shall submit the following:
  - 1. Product Data including Independent Test Lab Results
  - 2. Installation Details
  - 3. Sample Warranty
  - 4. Field layout and striping plans
  - 5. Details on construction, especially any details that may deviate from plans and specifications.
- G. Shop Drawings:
  - 1. Indicate field layout; field marking plan and details for the specified sports; i.e., NCAA Football; roll/seaming layout; methods of attachment, field openings and perimeter conditions.  
Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage.
  - 2. Provide joint submission with related trades when requested by Architect.
- H. Product Data:
  - 1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
  - 2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
  - 3. Submit data in sufficient detail to indicate compliance with the contract documents.
  - 4. Submit manufacturer's instructions for installation.

5. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.
- I. Samples: Submit samples, 6 x 6 inches, illustrating details of finished product in amounts as required by General Requirements, or as requested by Architect.
- J. Product Certification:
  1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
  2. Submit test results indicating compliance with Reference Standards.
- K. Project Record Documents: Record actual locations of seams, drains and other pertinent information in accordance with Division 1 Specifications Series, General Requirements.
- L. List of existing installations: Submit list including respective Owner's representative and telephone number.
- M. Warranties: Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.
- N. Testing data to the Owner to substantiate that the finished field meets the required shock attenuation, as per ASTM F1936.
- O. Testing Certification: Submit certified copies of independent (third-party) laboratory reports on ASTM testing:
  1. Pile Height, Face Weight & Total Fabric Weight ASTM D5848.
  2. Primary & Secondary Backing Weights ASTM D5848.
  3. Tuft Bind ASTM D1335.
  4. Grab Tear Strength ASTM D1682 or D5034
  5. Shock Attenuation ASTM F1936
  6. Water Permeability ASTM D4491

## 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The turf contractor and/or the turf manufacturer:
  1. Shall be experienced in the manufacture and installation of specified type of synthetic infill and **monofilament** fiber tufted grass system for a minimum of five (5) years with the same manufacturer, product and company they are proposing for this field.
  2. Shall have 10 fields in play for at least three years with the same manufacturer and company they are proposing for this field. Fields shall be 65,000 ft<sup>2</sup> or more that are at least 3 years old, which is equal to the respective warranty period, with the same infill system.
  3. Shall provide third party certification confirming that the tuft bind exceeds the Synthetic Turf Council minimums.
  4. Manufactures documentation of field turf compliance of DOC FF-1 "pill test" (CPSC 16 CFR, Part 1630), must be obtained prior to installation.
- B. Installer: It is the owners desire to insure both quality materials and installation. Therefore, all prospective bidders must comply with the following:
  1. All turf contractors must have been actively installing infilled synthetic grass systems for a minimum of eight years.
  2. All turf contractors must directly employ the installers of the synthetic grass and layered infilled turf systems. Subcontractors shall NOT be acceptable for the infilled synthetic grass installation. Installer shall be certified by the manufacturer and licensed.
  3. All turf contractors shall demonstrate that they meet the minimum eight-year experience requirement by submitting in writing the project names, contacts and telephone numbers of

past installations, where the turf contractor has installed in-filled synthetic grass systems over the last three years.

4. The designated Supervisory Personnel on the project shall be certified, in writing by the turf manufacturer, as competent in the installation of specified monofilament material, including sewing seams and proper installation of the infill mixture.
  5. The installer supervisor shall have a minimum of 5 years experience as either a construction manager or a supervisor of synthetic turf installations
- C. Pre-Installation Conference: Conduct conference at project site at time to be determined by Architect. Review methods and procedures related to installation including, but not limited to, the following:
1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
  2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner's representative, and the Architect.
- D. The Contractor shall verify special conditions required for the installation of the system.
- E. The Contractor shall notify the Architect of any discrepancies.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with Section, Product Requirements.
- B. Prevent contact with materials that may cause dysfunction.
- C. Deliver and store components with labels intact and legible.
- D. Store materials/components in a safe place, under cover, and elevated above grade.
- E. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.
- F. Inspect all delivered materials and products to ensure they are undamaged and in good condition.
- G. Comply with manufacturer's recommendations.

#### **1.7 SEQUENCING AND SCHEDULING**

- A. Coordinate the Work with installation of work of related trades as the Work proceeds.
- B. Sequence the Work in order to prevent deterioration of installed system.

#### **1.8 WARRANTY AND GUARANTEE**

- A. The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf and sub-base for a period of eight (8) years from the date of substantial completion.
- B. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; pre paid for the entire 8 year term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an "AM Best" A rated carrier and must reflect the following values:
  1. Pre-Paid 8-year insured warranty.
  2. Insured Warranty Coverage must be provided in the form of 1 single policy.
  3. Maximum per claim coverage amount of \$10,000,000.

4. Minimum of ten million dollar (\$10,000,000) annual aggregate
  5. Must cover full 100% replacement value of total square footage installed, minimum of \$7.00 per sq ft. (in case of complete product failure, which will include removal and disposal of the existing surface).
  6. Policies that include self insurance or self retention clauses shall not be considered.
  7. Policy cannot include any form of deductible amount.
  8. Sample policy must be provided at time of contract execution to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.
- C. At the time of substantial completion, the system's shock attenuation shall have an average G-max value less than **130** based on ASTM-F355A. At no time shall the G-max value exceed **190** throughout the life of the warranty.

## 1.9 MAINTENANCE SERVICE

- A. Contractor shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.
- B. Manufacturer must provide maintenance guidelines and a maintenance video to the
- C. facility maintenance staff.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  1. Basis of Design: 46 oz. Martix Turf by Hellas Construction; [www.hellasconstruction.com](http://www.hellasconstruction.com); [www.matrix-turf.com](http://www.matrix-turf.com); 12710 Research Blvd. Suite 240, Austin, TX, 78759.
- B. The following manufactures are hereby approved subject to the specifications:
  1. Astroturf; [www.astroturf.com](http://www.astroturf.com); Contact: Zack Riddleberger (336)238-9060; email:zriddleberger@astroturf.com
  2. FieldTurf; [www.fieldturf.com](http://www.fieldturf.com); Craig Yancey, Regional Sales Manager, (205)908-5608; Calhoun, Georgia
  3. Sprinturf, LLC; [www.sprinturf.com](http://www.sprinturf.com); Charlie Welsh, (651)239-0400; Daniel Island, SC 29492.
- C. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than ten (10) days prior to scheduled bid opening. Additionally, submit for approval a 12 inch by 12-inch sample, detailed specifications, and a complete material testing of the synthetic grass to be used on this project. The Architect will notify all material manufactures in writing of specification and product approval, prior to the bid opening. All manufactures shall include a sample manufacturer's warranty with request for approval.

### 2.2 MATERIALS - SYNTHETIC GRASS MATERIALS

- A. The synthetic turf material and resilient infill shall be in accordance with the following:
  1. Synthetic turf shall be comprised of a helix-shaped mono fiber tufted and coated with a secondary backing of high grade polyurethane. The synthetic turf yarn shall be comprised of a C8-based linear low density polyethylene polymer (LLDPE) with a 10,000 PPM UV Stabilizer. The fibers shall be tufted to a finished pile height of approximately 2 1/8" – 2 1/2". The turf fabric shall be filled with a layered system of pea gravel and rubber.
  2. All components and their installation method shall be designed and manufactured for use on outdoor and indoor athletic fields. The materials, as hereinafter specified, should be able to withstand full climatic exposure in all climates, be resistant to insect infestation, rot, fungus and mildew; to ultra-violet light and heat degradation, and shall have the basic characteristic of flow through-drainage allowing free movement of surface run-off through the turf fabric where such water may flow to the existing subbase and into the field drainage system.



3. The finished playing surface shall appear as mowed grass with no irregularities and shall afford excellent traction for conventional athletic shoes of all types. The finished surface shall resist abrasion and cutting from normal use. The installed system shall be suitable for football, soccer, lacrosse, baseball, softball, physical education classes, intramurals and recreational use.
4. The pile yarn (polyethylene) shall be a proven athletic caliber yarn designed specifically for outdoor use and stabilized to resist the effect of ultraviolet degradation, heat, foot traffic, water and airborne pollutants.
5. Infill material shall be layered system of pea gravel and rubber in accordance with the manufacturer's recommendations and the owner's preference and shall be constructed in accordance with the United States Patent #6,800,339 B.
6. Perimeter and interior edge details, underground storm sewer piping and connections, and goal post foundations required for the system shall be as detailed and recommended by the manufacturer and as approved by the Architect.
7. All designs, markings, layouts, and materials shall conform to all currently applicable National Federation or NCAA rules and other standards that may apply to this type of synthetic grass installation.
8. All field markings including numbers, arrows, hash marks, and sport specific lines or other designations will either be tufted in at the factory or inlaid on site. **Painted markings are not to be used.** Provide as follows:
  - a. **Logo at mid-field ("Tiger" Symbol – School Logo to be verified with the Owner prior to execution)**
  - b. **Each end zone lettering (2 color tone "TIGERS" "DESHLER" - 15' high)**
  - c. **Coach's Area (Owner to choose Color)**
  - d. **Players Bench Area (Owner to choose Color)**
  - e. **6' Perimeter Marking (Owner to choose Color)**
9. Composition:

<u>Standard</u>	<u>Property</u>	<u>Specification</u>
ASTM D418/D5848	Pile Weight	46 oz. /Sq. Yd.
ASTM D5848	Primary and Secondary Backing Weight	7.9 oz. /Sq. Yd.
ASTM D5848	Secondary Coating Weight	26 oz. /Sq. Yd.
ASTM D5848	Total Weight	79.9 oz. /Sq. Yd.
ASTM D1907	Yarn Denier	12,400
ASTM D418/D5848	Pile Height	Finished 2 ½"
ASTM D5793	Tufting Gauge	1/2"
ASTM D5848	Primary Backing	Tri-layer woven Polypropylene
ASTM D5848	Secondary Coating	Polyurethane
ASTM D1335	Tuft Bind without Infill	10 lbs. +/-
ASTM D1682/D5034	Grab Tear (length)	>300 lbs. Force
ASTM D1682/D5034	Grab Tear (width)	>350 lbs. Force

ASTM D4991	Carpet Permeability	>40 inches/hour
ASTM D2859	Flammability (Pill Burn)	Pass
ASTM F355	G-max (Impact Attenuation)	<130 at installation <190 over warranty life
ASTM E-11	Realfill™ Infill	4.5 - 6 lbs +/- per square foot
	Fabric Width	15'
	Perforation	3/16" Holes 4" X 4"
ASTM D3218	Yarn	Average thickness 170 microns C8 LLDPE Resin 10,000 PPM UV Stabilizer

10. All Characteristics listed above nominal +/- 5%.
11. Turf incorporates life like individual blades of grass, tufted into stable backing filled with a pea gravel (2-3 lbs) and cuboidal rubber infill (2.5-3.0 lbs) - Realfill™.
12. Infill will be a minimum of 75% of synthetic turf pile height.
13. Helix shape fibers during the manufacturing/extrusion process which

## 2.3 FIELD GROOMER & SWEEPER

- A. **Contractor shall furnish a field groomer and sweeper as part of the work.**
  1. Field Groomer and Field Sweeper shall be by the manufacture of the turf system.
  2. Field Sweeper shall include a towing attachment compatible with a field utility vehicle.

## 2.4 VERTICAL DRAINAGE BASE MATERIALS

- A. Excavation: Existing natural grass field shall be excavated to the depth as shown on the grading plan. The sub grade shall be shaped to achieve a .5% (one half of one percent) slope from the center of the field to each sideline in order to mirror the grade of the finished synthetic turf surface. The sub grade shall also be compacted and proof rolled to a minimum of a 95% compaction rate.
- B. Geotextile Filter Fabric:
- C. Non-woven polypropylene geotextile fabric shall be chemically and biologically inert and shall be equivalent to Mirafi, Mirafi Inc., Pendergrass, GA (888) 795-0808.
  1. Mirafi 140N or equal for Permeable applications
  2. Mirafi 500X or equal for Silty/Clayey Subgrades with fines content <35% and a PI<20.
  3. 16 Mil Woven Coated Polyethylene line for Impervious applications over moisture sensitive soils.
  4. Liner Selection to be made by Geotechnical Engineer of Recoed.
- D. Drainage Pipe: A network of perforated HDPE highway grade drainage pipe (1" x 12" flat panel pipe) shall be installed under a 6" layer of free draining base aggregate. The drainage pipe will be installed in a herringbone pattern every 15 feet on center and will be connected to perimeter collector lines. See Civil Drawings for complete drainage field requirements.
  1. ADS AdvanEdge, 800-821-6710 or Hydraway 2000.
  2. 1 inch by 12-inch flat drain.
  3. 8-inch diameter perforated collector drainpipe.
- E. Stone Base Courses:
  1. The following gradation of stone is proven and recommended when available in the vicinity of the project.

2. The Base Contractor is required to focus on achieving the planarity, porosity and compaction requirements to provide a sound crushed stone base for synthetic turf installation.
3. The free-draining base aggregate base layer shall consist of a consistent depth of open graded material. Base drainage aggregate used must achieve a 95% minimum overall compaction rate. Material shall be similar to the ALDOT # 57 classification material. The open graded aggregate material shall conform to the following criteria:

<u>Base Aggregate:</u>	Open Graded Stone (OGS)	
	<u>Weight Passing</u>	<u>Approximate Percentage Passing</u>
2" Sieve	36.99	100.0%
3/4" Sieve	34.04	92.0%
3/8" Sieve	21.5	58.0%
#4 Sieve	9.34	25.0%
#16 Sieve	203.3 grams	9.2%

- F. The choker material shall be a clean washed screenings meeting the Turf Contractor's approval. Material shall be similar to the ALDOT # 89 classification material.

<u>Choker Material:</u>	(Porous Stone Sand)	
	<u>Weight Passing</u>	<u>Approximate Percentage Passing</u>
3/8" Sieve	579.3 grams	100.0%
#4 Sieve	561.5 grams	96.8%
#8 Sieve	420.0 grams	72.0%
#16 Sieve	260.1 grams	45.0%
#30 Sieve	148.8 grams	25.0%
#50 Sieve	74.9 grams	13.0%
#100 Sieve	29.9 grams	5.0%
#200 Sieve	14.7 grams	2.0%

## 2.5 QUALITY CONTROL IN MANUFACTURING

- A. The manufacturer shall own and operate its own manufacturing plant in North America. Both tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer. Outsourcing of either is unacceptable.
- B. The manufacturer shall have full-time certified in-house inspectors at their manufacturing plant that are experts with industry standards.
- C. The manufacturer's full-time in-house certified inspectors shall perform pre-tufting fiber testing on tensile strength, elongation, tenacity, denier, shrinkage, and twist i.e., turns per inch, upon receipt of fiber spools from fiber manufacturer.
- D. Primary backing shall be inspected by the manufacturer's full-time certified in-house inspectors before tufting begins.
- E. The manufacturer's full-time in-house certified inspectors shall verify "pick count", yarn density in relation to the backing, to ensure the accurate amount of face yarn per square inch.
- F. The manufacturer's full-time, in-house, certified inspectors shall perform turf inspections at all levels of production including during the tufting process and at the final stages before the turf is loaded onto the truck for delivery.
- G. The manufacturer shall have its own, in-house laboratory where samples of turf are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.

- H. The manufacturer must have ISO 9001, ISO 14001 and OHSAS 18001 certifications demonstrating its manufacturing efficiency with regards to quality, environment and safety management systems.

## **PART 3 – EXECUTION**

### **3.1 GENERAL**

- A. Prior to ordering materials, submit a seam layout of field, striping plan and all details of construction that deviate from the plans and specifications.

### **3.2 EXAMINATION**

- A. Base Acceptance: The Architect and/or Owner's Representative and Turf Contractor must
- B. jointly approve the base before turf installation can begin.
- C. Verify that all sub-base leveling is complete prior to installation.
- D. Installer shall examine the surface to receive the synthetic turf and accept the sub-base
- E. planarity in writing prior to the beginning of installation.
  - 1. Acceptance is dependent upon the Contractors test results indicating compaction and planarity are in compliance with manufacturer's specifications.
- F. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- G. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2" from design grade.
- H. Correct conditions detrimental to timely and proper completion of Work.
- I. Do not proceed until unsatisfactory conditions are corrected.
- J. Beginning of installation means acceptance of existing conditions.

### **3.3 PREPARATION**

- A. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.
- B. Sub-base acceptance shall be subject to receipt of test results (by the Contractor) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.
- C. Dimensions of the field and locations for markings shall be measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.
- D. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the turf. A sub base that drains poorly is an unacceptable substrate.

### **3.4 VERTICALLY DRAINING BASE**

- A. The synthetic turf Base Contractor shall strictly adhere to the installation procedures outlined under this section. Any variance from these requirements must be accepted in writing, by the Turf Contractor's on-site representative, and submitted to the Architect/Owner, verifying that the changes do not in any way affect the warranty.
- B. Install geotextile fabric over excavated and prepared sub-grade in accordance Architect's recommendations. Provide a 36" minimum overlap at all seams. Fabric shall first be installed in the drainage trenches prior to installation of perimeter collector lines. After backfilling of all trenches is complete, the entire field shall be covered with fabric prior to the base aggregate application.
- C. Trenching, Drainage Pipe Installation and Backfilling: All piping shall be as specified and connected by couplers, plugs etc. Design of the drainage system for the Football Field shall be by

this Contractor and accepted by the manufacture of the synthetic grass system prior to installation.

1. The base grade shall be shaped to mirror the finished grade and approved by the Architect and/or Owner's Representative. The Base Contractor shall begin layout and trenching for the drainage network as indicated on the drainage plan and all details that apply. Collector lines shall be installed before lateral lines and shall begin with the deepest elevations. Collector lines shall be connected to discharge outlet at the onset of operations. Trenching progress shall work upward in elevation to allow for immediate discharge of water from the entire field in the event of a rainfall.
  2. No trenches, with or without pipe, shall be permitted, to remain unfilled overnight and/or while crews are not progressively working on site.
  3. All perimeter trenches must be dug in accordance with the field drainage plan details.
  4. After all collector and lateral lines have been installed, the Base Contractor shall repair any sub grade undulations prior to installing geotextile fabric.
- D. Concrete Header Curb and Pressure Treated Wood Turf Nailer: The synthetic turf perimeter fastening structure shall be installed before the drainage aggregate.
1. The General Contractor shall furnish and install a 6" x 12" concrete header curb around the entire inside of the track at the football field, top of header of the curb shall be flush with track surface. Curb shall be installed in accordance with the manufactures requirements. The foundation of the concrete header curb shall be a compacted free draining aggregate. Future water entering the foundation shall have a free draining path directly to the perimeter collector pipe.
  2. Install a pressure treated wood 2" x 4" nailer. Pressure treated wood nailer shall be set below top of the curb as specified by means of a Tapcon or ramset every 12 inches. This shall be the responsibility of the Base Contractor.
- E. Base Drainage Aggregate: The installation of the base drainage aggregate shall only begin after the drainage pipe installation has been inspected and approved by Architect/Owner's Representative. Installation of the Free Draining Base Aggregate shall follow procedures that protect the base grade soils and drainage pipe. The drainage pipe network and its existing elevations shall not be disrupted through ground pressures from trucks, dozers or by any other means.
1. The base grade subsoil shall be dry before undertaking the placement of base aggregate.
  2. Delivery trucks shall enter the field only from the designated entrance point. Base course stone shall be dumped closest to the entrance first and continuously worked towards the furthest point of the field. Extreme care must be taken not to disturb sub grade or drainage network.
  3. Track-type dozers shall push out the stone from behind the pile onto and toward the field center. Dozers shall only traffic the aggregate they are spreading.
  4. Bulldozer blades shall be equipped with a laser-guided hydraulic system. Care shall be taken not to disturb or contact the base grade soils with the dozer blades or tracks. All equipment trafficking over the drainage aggregate shall insure there is a minimum depth of 4" of aggregate between the geotextile fabric and the dozer track ground contact position.
  5. When the aggregate spreading is completed, the surface shall be further-firmed by a 5-ton roller. Static vibration shall not be part of this process.
  6. The stone shall be left firm, but not over-compacted as to protect the porosity and drainage capabilities of the aggregate profile.
  7. After the drainage stone has been uniformly spread throughout the surface, the surface shall receive a final laser finished grade. This process shall be accomplished using a turf-type tractor, or lightweight grader, equipped with high flotation tires and a hydraulically controlled laser blade.

8. The free-draining base course must be installed to a depth of 5 inches and shall be independently tested for an overall compaction rate of 95% proctor.
- F. Choker Levels: The base drainage stone final elevations shall mirror the proposed choker layer final grade material. Care shall be taken not to allow the coarser aggregate to surface into the profile or finished grade of the choker layer.
1. The choker layer shall be applied using high flotation grading equipment. The choker material shall be evenly spread throughout the proposed field surface to the final pre-pad or pre-turf elevations.
  2. After the choker material has been uniformly spread throughout the surface by the described method, the surface shall receive a final laser finish grade. This process shall be accomplished using a turf-type tractor, or lightweight grader, equipped with high flotation tires and a hydraulically controlled laser blade.
  3. Care shall be taken throughout the installation not to force the choker material into the porosity of the base aggregate below.
  4. Final choke layer must be graded by means of a laser within 0 to 1/2 inch from design grade. The finished surface tolerance must not exceed 1/4 inch over 10 feet in all directions. Base Contractor must provide a topographical survey with a minimum of 200 shots demonstrating finished grade meets all written requirements.
  5. Final layer of stone must be installed at a depth of one (1) inch. Finished aggregate base must be proof-rolled by means of 2- to 5-ton roller. The finished aggregate base must achieve an overall compaction rate of 95% proctor in accordance with ASTM D1557. It shall also be flush with top of pressure treated wood nailer.
  6. The Contractor is required to stringline the entire field every five feet to identify high and low spots. And identified high and low spots must be eliminated prior to installation of the synthetic turf.

### **3.5 TURF INSTALLATION - GENERAL**

- A. The installation shall be performed in full compliance with approved Shop Drawings.
- B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.
- C. The designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including seams and proper installation of the Infill mixture.
- D. Designs, markings, layouts, and materials shall conform to all currently applicable National
- E. Collegiate Athletic Association rules, NFHS rules, and/or other rules or standards that may
- F. apply to this type of synthetic grass installation. Designs, markings and layouts shall first be approved by the Architect or Owner in the form of final shop drawings. All markings will be in full compliance with final shop drawings.

### **3.6 INSTALLATION**

- A. Install at location(s) indicated, to comply with final shop drawings, manufacturers' / installer's instructions.
- B. Only factory-trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the synthetic turf manufacturer's
- C. installation supervisors shall undertake the placement of the system.
- D. The surface to receive the synthetic turf shall be inspected and certified by the turf manufacturer as ready for the installation of the synthetic turf system and must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.

- E. The Contractor shall strictly adhere to specified procedures. Any variance from these requirements shall be provided in writing, by the manufacturer's on-site representative, and submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with the manufacturer's standard procedures.
- F. The subbase and curbs shall be inspected by the Engineer or Sitework Contractor by means of a laser level and plotted on a 10-foot grid. Based upon the Turf Contractor's inspection of the topological survey, the Sitework Contractor shall fine grade the subbase suitably - including properly rolling and compacting the base to achieve a surface planarity within  $\frac{1}{4}$ " in 10 feet (+0, -  $\frac{1}{4}$ "0). OWNER, ENGINEER OR PRIME CONTRACTOR SHALL NOT APPROVE THE SUBBASE FOR TOLERANCE TO GRADE WITHOUT OBTAINING THE TOPOLOGICAL SURVEY.
- G. The Turf Project Superintendent shall thoroughly inspect all materials delivered to the site both for quality and quantity to assure that the entire installation shall have sufficient materials to maintain the schedule and proper mixing ratios.
- H. Synthetic turf shall be loose laid across the field and attached to the perimeter edge detail. Turf shall be of sufficient length to permit full cross-field installation. No head or cross seams will be allowed, except as required for inlaid fabric striping or to accommodate programmed cut-outs.
- I. All seams shall be flat, tight, and permanent with no separation or fraying. All seams and markings shall be adhered to a special tape with a single component, high strength polyurethane adhesive applied per the Turf Contractor's standard procedures for outdoor applications.
- J. Infill materials shall be properly applied in numerous thin lifts using special broadcasting equipment to produce a layered system of pea gravel and SBR rubber particles. The turf shall be raked and brushed properly as the mixture is applied. The infill material shall be installed to a depth of about 1.75 inches. The layered system of pea gravel and rubber infill materials can only be applied when the turf fabric is dry.

### **3.7 FIELD MARKINGS**

- A. Field markings shall be installed in accordance with approved shop drawings. Football is designated as the primary sport, all yard lines will be tufted-in.
- B. All sports markings will be inlaid in accordance with the Drawings.
- C. Center field logo shall be inlaid according to artwork indicated on Drawings and in accordance with Owners palette of colors.
- D. End-zone letters and logos shall be inlaid according to artwork and fonts indicated on the Drawings, and in accordance with Owners palette of colors.

### **3.8 ADJUSTMENT AND CLEANING**

- A. Do not permit traffic over unprotected surface.
- B. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- C. All usable remnants of new material shall become the property of the Owner.
- D. The Contractor shall keep the area clean throughout the project and clear of debris.
- E. Surfaces, recesses, enclosures, and related spaces shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

### **3.9 PROTECTION**

- A. Protect installation throughout construction process until date of final completion.

### **END OF SECTION**

## SECTION 02810 - SODDING AND TOPSOIL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Sod:
  - 1. Provide strongly rooted **419 Bermuda Sod**
  - 2. Sod shall be not less than 2 years old and free of weeds and undesirable native grasses.
  - 3. Only provide sod capable of growth and development when planted (viable, not dormant).
  - 4. Provide machine cut sod of a uniform minimum soil thickness of 5/8 inch, plus thickness of top growth and thatch. Sod pieces to be consistent in size and shape.

### PART 3 - EXECUTION

#### 3.1 GENERAL REQUIREMENTS

- A. Sodding shall be restricted to those as instructed or recommended by the local Cooperative Extension Agent except when special instructions to the contrary are issued in writing by the Architect.
  - 1. The Contractor shall furnish, in writing to the Architect, those recommendations of the Extension Agent before proceeding with any operations.
  - 2. Grassing also shall comply with State of Alabama Highway Department specifications, latest Edition.
  - 3. Contractor shall water and maintain newly grassed areas until acceptable stand of grass is established and approved by the Architect.
- B. Preparation of Subgrade Soil:
  - 1. The subgrade soil in those areas to be sodded whether shown or not shown on the plans shall be loosened to a minimum depth of 3 inches and graded to remove all ridges and depressions so that it will be, after settlement everywhere parallel to and at the proper level to provide finished grades specified.
  - 2. All stones over 1" in dimension, sticks, rubbish and other extraneous matter shall be removed during this operation.
- C. Topsoil:
  - 1. Contractor shall furnish and spread layer of topsoil over all areas.

Topsoil shall be spread in loose layers to provide finished grades specified and shall have an equal depth of not less than 4" over the site after natural settlement and light rolling.
- D. All areas shall be carefully graded and raked to accurate specified grades and uniform slopes following topsoil spreading. The surface, when finished and settled shall conform to required grades and shall be free from hollows and other inequalities, from stones over 1" in diameter, sticks and other debris, and shall be satisfactory to the Architect.
- E. Initial fertilization of sodded area prior to sodding and following preparation, commercial fertilizer 4-10-10 or 4-12-12 shall be applied on all grass areas at the uniform rate of 20 pounds per 1,000 square feet each.



### **3.2 SODDING**

- A. Prepare all areas to receive sod.
- B. **The Contractor shall fully sod all graded and disturbed areas, including the Contractors staging area and all areas disturbed by vehicular construction traffic, whether shown on plans or not.**

### **3.3 TOPSOIL**

- A. General:
  - 1. Provide topsoil of natural, friable, fertile, fine loamy, soil possessing the characteristics of representative top soils in the vicinity which produces a heavy growth; free from subsoil, weeds, litter, clods, stiff clay, stones, stumps, roots, trash, toxic substances or any other material which may be harmful to plant growth or hinder planting operations.
  - 2. The topsoil shall not be in a muddy or frozen condition. Topsoil shall be that material stripped and stockpiled, or as required to provide 4" of coverage.
  - 3. The topsoil shall have a pH range of 5.9 to 7.0.
  - 4. Limestone or aluminum sulfate (or acceptable substitute) may be used to adjust the pH of the topsoil to an acceptable level.

**END OF SECTION**

## SECTION 02811 - SEEDING AND TOPSOIL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Seed:
  - 1. Seeds shall be **Tifton Bermuda** in accordance with State of Alabama Highway Department Specification Section 652.

### PART 3 - EXECUTION

#### 3.1 GENERAL REQUIREMENTS

- A. Seeding season(s) shall be restricted to those as instructed or recommended by the local Cooperative Extension Agent except when special instructions to the contrary are issued in writing by the Architect.
  - 1. The Contractor shall furnish, in writing to the Architect, those recommendations of the Extension Agent before proceeding with any operations.
  - 2. Seeding also shall comply with State of Alabama Highway Department specifications, latest Edition.
  - 3. Contractor shall water and maintain newly seeded areas until acceptable stand of grass is established and approved by the Architect.
- B. Preparation of Subgrade Soil:
  - 1. The subgrade soil in those areas to be seeded whether shown or not shown on the plans shall be loosened to a minimum depth of 3 inches and graded to remove all ridges and depressions so that it will be, after settlement everywhere parallel to and at the proper level to provide finished grades specified.
  - 2. All stones over 1" in dimension, sticks, rubbish and other extraneous matter shall be removed during this operation.
- C. Topsoil:
  - 1. Contractor shall furnish and spread layer of topsoil over all areas.
  - 2. Topsoil shall be spread in loose layers to provide finished grades specified and shall have an equal depth of not less than 4" over the site after natural settlement and light rolling.
- D. All areas shall be carefully graded and raked to accurate specified grades and uniform slopes following topsoil spreading. The surface, when finished and settled shall conform to required grades and shall be free from hollows and other inequalities, from stones over 1" in diameter, sticks and other debris, and shall be satisfactory to the Architect.
- E. Initial fertilization of sodded area prior to sodding and following preparation, commercial fertilizer 4-10-10 or 4-12-12 shall be applied on all grass areas at the uniform rate of 20 pounds per 1,000 square feet each.

#### 3.2 SEEDING

- A. Prepare all areas to receive seeding.
- B. **The Contractor shall fully seed all areas indicated on the drawings.**
- C. **If not indicated, the Contractor shall fully Sod the areas per Section 02810, Sodding and**

### **Topsoil.**

- D. Seedbeds shall be firmed by rolling before seedings are made.
- E. The seed or seed mixture for lawn areas as recommended shall be sown at the rate of six pounds per one thousand square feet exercising great care that a uniform distribution of seed is obtained.
- F. Seeding shall be done on a still day, using a hopper type seeder, one-half of the seed or seed mixture for each area being sown in a direction at right angles to the other half.
- G. After seeding, the surface shall be lightly raked, rolled once with a roller weighing not less than one hundred pounds per lineal foot, and thoroughly watered with a fine spray.

### **3.3 TOPSOIL**

- A. General:
  - 1. Provide topsoil of natural, friable, fertile, fine loamy, soil possessing the characteristics of representative top soils in the vicinity which produces a heavy growth; free from subsoil, weeds, litter, clods, stiff clay, stones, stumps, roots, trash, toxic substances or any other material which may be harmful to plant growth or hinder planting operations.
  - 2. The topsoil shall not be in a muddy or frozen condition. Topsoil shall be that material stripped and stockpiled, or as required to provide 4" of coverage.
  - 3. The topsoil shall have a pH range of 5.9 to 7.0.
  - 4. Limestone or aluminum sulfate (or acceptable substitute) may be used to adjust the pH of the topsoil to an acceptable level.

### **3.4 MULCHING**

- A. Mulching of seeded areas is required and shall consist of hand or machine application of mulch.
- B. The mulch shall be loose enough to permit air to circulate but compact enough to reduce erosion.
- C. If baled mulch material is used, care shall be taken that the material is in a loosened condition and contains no lumps or knots of compacted material.
- D. The rate of application shall be sufficient to provide a layer of mulch ½ inch thick in depth over the entire seeded area.
- E. Mulching shall begin immediately following completion of seed sowing operations.

### **END OF SECTION**

## SECTION 02831 - VINYL COATED CHAIN LINK FENCES AND GATES

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. Extent of chain link fences and gates is indicated on drawings.

#### 1.3 SECTION INCLUDES

- A. Fence framework, fabric, and accessories.
- B. Excavation for post bases; concrete foundation for posts gate assemblies.
- C. Manual swing gates and related hardware.

#### 1.4 REFERENCES

- A. ANSI/ASTM A123 - Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- B. ASTM A116 - Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric.
- C. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- D. ASTM A569 - Steel, Carbon (0.15 Maximum Percent), Hot-Rolled Sheet and Strip Commercial Quality.
- E. ASTM C94 - Ready-mixed Concrete.

#### 1.5 SYTEM DESCRIPTION

- A. **Fence Height:** As indicated on drawings, otherwise 4 feet.
- B. **Fence Length:** As indicated on drawings.
- C. **Location:** As indicated on drawings.
- D. Intervals not exceeding 10 feet on center in straight runs and 8 feet on center curves.

#### 1.6 SUBMITTALS

- A. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
- B. Qualifications:
- C. Manufacturer: Company specializing in manufacturing the products specified in this Section to have minimum three years documented experience.

#### 1.7 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings prior to installation.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

- A. Fence System:
  - 1. Master-Halco, Inc
  - 2. Merchants Metals
  - 3. Stephens Pipe and Steel, LLC.
  - 4. Equal products of other manufacturers may be used in the work provided, such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

- B. Fence Framework:
  - 1. Allied Tube: Product SS 40.
  - 2. Century Tube: Product CMT 40.
- C. Chain Link Fabric:
  - 1. Merchants Metals.
  - 2. Cargill.
- D. Padlocks:
  - 1. Yale.
  - 2. Master.
  - 3. Sargent.

## **2.2 MATERIALS & COMPONENTS**

- A. Framing Materials: Round SS 40, steel pipe, vinyl coated per ASTM F1234 outside. Post to have tops to exclude moisture.
- B. Fabric: 9 gage fused bonded fabric shall have PVC coating of 7 to 12 mils per ASTM F668 Class 2B.
- C. Swing Gates: Size as shown on Drawings covered with chain link fabric. Gates shall be complete with industrial type, fixed pin, 180 degree hinges and drop latches with padlock left in proper operating condition.
- D. Padlocks: Industrial grade and shall be keyed alike, and as Owner's existing locks, when more than one is required.
- E. Components:
  - 1. Line Posts: 2.0 inch outside diameter.
  - 2. Corner and Terminal Posts: 3.0 inch outside diameter.
  - 3. Swing Gate Posts: 3.0 inch minimum outside diameter for less than 6 foot gate leaf. 4.0 inch minimum outside diameter for 6 foot gate leaf or greater or outside diameter as required by design. Posts shall be of sufficient diameter and weight to prevent deflection or gate sagging.
  - 4. Top and Bottom Rail: 1-5/8 inch diameter, plain end, sleeve coupled with 0.111 inch wall thickness. Provide Mid-Rails at fences and gates in excess of 5 feet in height.
  - 5. Swing Gate Frame: 1-5/8 inch minimum diameter welded or fitting type fabrication. Welded fabrication shall be vinyl coated after weld connections are made. The frame components shall be of sufficient diameter, weight and design to avoid sagging and allow easy operation.
  - 6. Fabric: 2 inch vinyl coated diamond mesh interwoven wire, 9 gage thick, top selvage twisted tight, bottom selvage knuckle end closed.
  - 7. Tension Wire: 7 gage thick steel, single strand, vinyl coated.
  - 8. Tie Wire: Aluminum alloy steel wire, vinyl coated.
- F. Accessories:
  - 1. Caps: Cast steel vinyl coated; sized to post diameter, set screw retainer.
  - 2. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel, vinyl coated.
  - 3. Swing Gate Hardware: Fork latch with gravity drop, center gate stop and drop rod; three 180 degree gate hinges per leaf and hardware for padlock.
- G. Finishes:
  - 1. Components: Vinyl coated to ASTM F123, 10-14 mil coating.

2. Hardware: Vinyl coated.
3. Accessories: Same finish as fabric.
4. Color: Shall be selected by Architect and Owner.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Install framework, fabric, accessories and gates in accordance with ANSI/ASTM F567 and manufacturer's instructions.
- B. Set all posts plumb, in concrete footings with top of footing 1 inch above finish grade. Slope top of concrete for water runoff.
- C. Line Post Footing Depth Below Finish Grade: Minimum three feet (18 inches in solid rock) and not less than 12 inches in diameter.
- D. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: Minimum three feet (18 inches in solid rock) and not less than 12 inches in diameter.
- E. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate posts.
- F. Provide top rail through line post tops and splice with 6 inch long rail sleeves.
- G. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
- H. Position bottom of fabric 2 inches above finished grade.
- I. Fasten fabric to top, bottom and mid- rails, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- J. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips. Install bottom tension wire stretched taut between terminal posts.
- K. Do not swing gate from building wall; provide gate posts.
- L. Install gates with fabric to match fence. Install three hinges per leaf, latch, catches, drop bolt, foot bolts and sockets, torsion spring, retainer and locking clamp.
- M. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.
- N. Clean all excess grout, concrete, grease, paint, etc., from fence.
- O. Erection Tolerances:
  1. Maximum Variation From Plumb: 1/4 inch.
  2. Maximum Offset From True Position: 1 inch.
  3. Components shall not infringe adjacent property lines.

#### **3.2 SCHEDULE**

- A. Fence and gate location(s) as indicated on Drawings.
- B. Fence and gate size(s) as indicated in this section, otherwise as indicated on drawings.

### **END OF SECTION**

## **SECTION 02900 - IRRIGATION SYSTEM**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 GENERAL**

- A. Work included: General Contractor shall provide irrigation system as designed by Irrigation supplier for sodded and landscaped areas, and as specified herein. The work includes, but is not limited to:
  - 1. For sodded and landscaped areas as indicated on the drawings, complete in place, tested and approved, including but not necessarily limited to, the lawn and shrub sprinkler system, automatic controller and remote control valves and separate irrigation water meter.
  - 2. Trench, backfill and compaction for irrigation lines.
  - 3. Automatically controlled landscape irrigation system; backflow preventer; pressure reducing valve; isolation gate valves; piping and sleeves under paving; repair of paving, main and lateral lines; electrical valves and wiring; valve boxes and controllers; sprinklers; couplings; connectors; fittings; and if needed, tape and meter.
  - 4. Test all systems and make operative.
  - 5. Submit Record Drawings and Maintenance Manual.
  - 6. One-year Guarantee Period.
  - 7. Maintain and operate for 1-year beyond Date of completion of Substantial Completion punch list.

#### **1.3 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Installer Qualifications:
  - 1. Firm shall hold Alabama General Contractors License for Specialty Construction, Sub-classification - Landscaping or Other Specialty Construction (specified as Irrigation). Firm experienced in the successful installation of a minimum of five (5) projects within the past five (5) years similar in scope, quality, and contract value to that indicated for this project. Firm shall have sufficient manpower, equipment and financial resources to complete the Work of this Section.
  - 2. The Owner and the Architect reserve the right to reject any and all materials and workmanship, which they deem to be not in accordance with Drawings and Specifications. Rejected materials and work shall be removed from site immediately and replaced with that of the specified quality.
- C. Applicable Standards:
  - 1. ASTM:
    - a. D1785: Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40.
    - b. D2464: Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Threaded, Schedule 40.
    - c. D2466: Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Socket Type, Schedule 40.
    - d. D2564: Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
  - 2. Applicable Codes:
    - a. Most current edition of Uniform Plumbing Code.
    - b. Applicable Building Code.

- c. All applicable local codes and ordinances.
  - d. National Electrical Code.
  - e. Should Specification's requirements differ from local requirements, consider Contract Document requirements to be the minimum acceptable and comply with any more stringent local requirements.
- D. Permits and Fees:
- 1. Obtain all permits and pay required fees to any agency having jurisdiction over the work.
  - 2. Arrange inspections required by local ordinances during the course of construction.
  - 3. Upon completion of the work, furnish satisfactory evidence to show that all work has been installed in accordance with the ordinances and code requirements.

#### **1.4 SUBMITTALS**

- A. Product Data: Within thirty (30) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
- 1. Materials list of items proposed to be provided under this Section.
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
  - 3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used for the Work.
- B. As-built Drawings: Any changes in the layout and/or arrangements of the proposed irrigation system, or any other differences between the proposed system and actual installed conditions are to be recorded by the Irrigation Contractor in the form of an "As-Built" drawing. Provide the Owner and the Architect with a copy of the drawings before work under this Contract will be considered for acceptance. All isolation valve locations shall be shown with actual measurements to reference points so they may be located easily in the field.

#### **1.5 WARRANTY**

- A. Warranty for all work for a period of one (1) year after date of final acceptance of the work in total, against defects in materials, equipment, workmanship and any repairs required resulting from leaks or other defects of workmanship, material or equipment.
- 1. Repair unsatisfactory conditions promptly at no cost to the Owner.
  - 2. Emergency repairs may be made by the Owner without relieving the Irrigation Contractor of his warranty obligations.
  - 3. Repair settling of backfilled trenches occurring during the warranty period, including restoration of damaged plantings, paving or improvements resulting from settling of trenches or repair operations.
  - 4. Respond to Owner's request for repair work within five (5) calendar days. If not, Owner may proceed with such necessary repairs at the Contractor's expense.

### **PART 2 – PRODUCTS**

#### **2.1 PIPE**

- A. Plastic Pipe:
- 1. Use three quarter inch ( $\frac{3}{4}$ " ) and one inch (1" ) sizes, Class 200 polyvinyl chloride; and one and one quarter inch ( $1\frac{1}{4}$ " ) and up, Class 160 polyvinyl chloride, bearing the seal of the National Sanitation Foundations, unless otherwise specified by local codes.
  - 2. Fittings: Use Schedule 40 polyvinyl chloride, type I-II, bearing the seal of the National Sanitation Foundation, and complying with ASTM D2466.



3. For joining, use a solvent complying with ASTM D2466 and recommended by the manufacturer of the approved pipe.
4. Plastic Pipe Identification: Continuously and permanently mark with manufacturer's name, pipe size, schedule number, type of material and code number.

## **2.1 RISERS**

- A. Lawn Heads: Polyethylene cut-off type or swing joints.
- B. Shrub Head: Use Schedule 80 threaded PVC.
- C. Quick Coupling Valves: Use Schedule 80 PVC. Pipe nipples and Schedule 40 Street Ells as a three elbow swing joint to permit readjustment of valve angle.

## **2.2 VALVES**

- A. Gate Valve:
  1. Provide one hundred and twenty-five (125) pound rated screwed valve of size required for the line as shown on the Drawings.
  2. Acceptable manufacturers:
    - a. Harvard
    - b. Crane
    - c. Equal products of other manufacturers may be used in the work provided, such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. Quick Coupling Valves
  1. Provide specified size, one piece construction, all brass to fit single or double lug couplers.
  2. Deliver to the Owner the following items, all matching the approved quick coupling valves:
    - a. coupler keys - quantities as specified
    - b. hose swivels - quantities as specified
  3. Acceptable Manufacturers:
    - a. Toro
    - b. Rainbird
    - c. Equal products of other manufacturers may be used in the work provided, such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

## **2.3 MANUAL AND AUTOMATIC VALVE SLEEVES**

- A. For Manual Control Valve: Provide flexible plastic sleeve and four inch (4") cyclolac marker.
- B. For Gate Valves:
  1. Provide round reinforced plastic boxes with lids, with the word "WATER" cast into the lids.
- C. Acceptable manufacturers:
  1. Ametek
  2. Equal products of other manufacturers may be used in the work provided, such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

## **2.4 SPRINKLER HEADS**

- A. Provide the sprinkler heads as located by Irrigation Contractor.

## **2.5 BACKFLOW PREVENTER**

- A. Provide as shown on the schedule on the Drawings. Double check type backflow preventer.
- B. Acceptable manufacturers:
  - 1. Watts #700
  - 2. Equal products of other manufacturers may be used in the work provided, such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

## **2.6 OTHER MATERIALS**

- A. Provide other materials, not specifically described but required for a complete and proper installation as selected by the Contractor subject to the approval of the Architect.

# **PART 3 – EXECUTION**

## **3.1 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

## **3.2 FIELD MEASUREMENTS**

- A. Make necessary measurements in the field to ensure precise fit of items in accordance with the approved design.

## **3.3 TRENCHING AND BACKFILLING**

- A. Trench, backfill and compact in accordance with the detail on the drawings.

## **3.4 INSTALLATION OF PIPING**

- A. Lay out the piping system in accordance with arrangement shown on the Drawings.
- B. Where piping is shown on the Drawings to be under paved areas but running parallel and adjacent to planted areas, the intention is to install the piping in the planted areas.
- C. Unless otherwise indicated, comply with requirements of Uniform Plumbing Code.
- D. Piping Depth: Install piping with at least the following minimum depth:
  - 1. Main lines - 18"
  - 2. Laterals - 12"
- E. Plastic Pipe:
  - 1. Exercise care in handling, loading, unloading and storing plastic pipe and fittings:
    - a. Store under cover until ready to install.
    - b. Transport only in a vehicle with a bed long enough to allow the pipe to lay flat to avoid undue bending and concentrated external load.
    - c. Repair dented and damaged pipe by cutting out and discarding the dented or damaged section, and rejoining with a coupling.
    - d. In jointing, use only the specified solvent and make joints in accordance with the manufacturer's recommendations as approved by the Landscape Architect.
    - e. Center load plastic pipe with a small amount of backfill to prevent arching and whipping under pressure.
    - f. For plastic-to-steel connections:
      - i. Work the steel connection first.
      - ii. Use Teflon tape on threaded plastic-to-steel connections.

- iii. Use only light wrench pressure.

### **3.5 INSTALLATION OF EQUIPMENT**

- A. Install manual and automatic control valves where indicated on the Drawings and in accordance with the manufacturer's recommendations as approved by the Architect.
- B. Quick Coupling Valves:
- C. Install in lawn areas with the top flush with the finish grade, and eight inches (8") from pavements and heads.
- D. Install in planting areas with tops two inches (2") above grade and eight inches (8") from pavement and heads.
- E. Lawn Sprinkler Heads:
  - 1. Install where indicated on the Drawings and in accordance with the manufacturer's recommendations as approved by the Architect. Set heads at finished grade.
- F. Shrub Spray Heads:
  - 1. Install where indicated on the Drawings and in accordance with the manufacturer's recommendations as approved by the Architect.

### **3.6 TESTING AND INSPECTING**

- A. Testing:
  - 1. Notify Architect twenty-four (24) hours prior to pressure test. Unless otherwise instructed, Architect shall be present at pressure test.
  - 2. Make necessary provision for thoroughly bleeding the line of air and debris.
  - 3. After valves have been installed, test live water lines for leaks at a pressure of one hundred (100) psi for a period of two (2) hours, with a five (5) psi pressure loss.
  - 4. Observe lateral lines for leaks during operation.
  - 5. Provide required testing equipment and personnel.
  - 6. Repair leaks, and retest until acceptance by the Architect.
- B. Final Inspection:
  - 1. Clean, adjust, and balance all systems. Verify that:
    - a. Remote control valves are properly balanced.
    - b. Heads are properly adjusted for radius and arc of coverage;
    - c. The installed system is workable, clean and efficient.

### **3.7 INSTRUCTIONS**

- A. Attach legible legend inside each controller door, stating the areas covered by each remote control valve.
- B. After the system has been completed, inspected and approved, instruct the Owner's maintenance personnel in the operation and maintenance of the system.

### **3.8 CLEAN UP AND PROTECTION**

- A. During irrigation work, keep pavements clean and work area in an orderly condition.
- B. Upon completion of work, clear grounds of debris, superfluous materials and all equipment. Remove from site to satisfaction of Architect and Owner.
- C. Protect landscape work and materials from damage due to irrigation operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged work as directed, at no additional cost to the Owner.

**END OF SECTION**

## SECTION 03310 – CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. Extent of concrete work is shown on drawings.

#### 1.3 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:
  - 1. ACL 301 "Specifications for Structural Concrete for Buildings".
  - 2. ACI 318 "Building Code Requirements for Reinforced Concrete"
  - 3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
- B. Concrete Testing Service: The **Owner** will engage and pay a testing laboratory to perform material evaluation tests.
- C. Materials and installed work may require retesting, as directed by Architect, at anytime during progress of work. Provide free access to material stockpiles and facilities. Retesting of rejected materials and installed work, shall be done at Contractor's expense.

#### 1.4 SUBMITTALS

- A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joints systems, curing compounds, dry-shake finish materials and others as requested by Architect.
- B. Shop Drawings Reinforcements: Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement.
- C. Material Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

### PART 2 - PRODUCTS

#### 2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.
- B. Use plywood complying with U. S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- C. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two (2) edges and one (1) side for tight fit.
- D. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

## **2.2 REINFORCING MATERIALS**

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed, unless otherwise noted.
- B. Steel Wire: ASTM A 82, plain, cold-drawn, steel.
- C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications, unless otherwise acceptable.
  - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
  - 2. For exposed to view concrete surfaces, where legs of supports are in contact with forms, provide support with legs which are plastic protected (CRSI, Class I) or stainless steel protected (CRSI, Class 3).

## **2.3 CONCRETE MATERIALS**

- A. Portland Cement: ASTM C 150, Type 1, unless otherwise acceptable to Architect.
  - 1. Use one brand of cement throughout project, unless otherwise acceptable to Architect.
- B. Normal Weight Aggregate: ASTM C 33, and as herein specified. Provide aggregate from a single source for all concrete.
  - 1. Do not use fine or coarse aggregates containing spalling-causing deleterious substances.
- C. Water: Drinkable.
- D. Air-Entraining Admixture: ASTM C 260.
  - 1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
    - a. Air-Mix, Euclid Chemical Co.
    - b. Sika-Ai", Sika Corp.
    - c. Darex AEA, W. R. Grace
    - d. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- E. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.1% chloride ions.
  - 1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
    - a. Accelguard 80; Euclid Chemical Company
    - b. Pozzolith High Gally; Master Builders
    - c. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- F. Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and contain not more than 0.1% chloride ions.
  - 1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
    - a. Edoco 20006; Edoco Technical Products
    - b. Pozzolith 300-R; Master Builders

- c. Eucon Retarder 75; Euclid Chemical Company
  - d. Daratard; W. R. Grace
  - e. Plastiment; Sika Chemical Company
  - f. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- G. Certification: Provide admixture manufacturer's written certification that chloride ion content complies with specified requirements.
- H. Calcium chloride or admixtures containing more than 0.1% chloride ions are not permitted.

## **2.4 RELATED MATERIALS**

- A. Moisture Barrier: Provide moisture barrier cover over prepared base material where indicated. Use only materials which are resistant to decay when tested in accordance with ASTM E 154, as follows:
- 1. Polyethylene sheet not less than 10 mils thick.
- B. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- C. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
- 1. Waterproof paper
  - 2. Polyethylene film.
  - 3. Polyethylene-coated burlap.
- D. Liquid Membrane Forming Curing Compound: Liquid type membrane forming curing compound complying with ASTM C 309, Type 1-D, Class A unless other type acceptable to Architect. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal. Equal to "Kure-N-Seal" - 30; Sonneborn-Contech
- 1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
    - a. Master Builders
    - b. Euclid Chemical Company
    - c. A.C. Horn
    - d. The Burke Company
    - e. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- E. Bonding Compound: Polyvinyl acetate or acrylic base, re-wettable type.
- 1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
    - a. Welcrete; Larsen Products
    - b. EucoWeld; Euclid Chemical Company
    - c. Hornweld; A. C. Horn
    - d. Sonocrete; Sonneborn-Contech
    - e. Acrylic Bondcrete; The Burke Company
    - f. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

- F. Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade", and "Class" to suit project requirements.
1. MANUFACTURERS: The following manufacturers' products have been used establish minimum standards for materials, workmanship and function:
    - a. Epoxitite; A. C. Horn
    - b. Sikadur Hi-Mod; Sika Chemical Corporation
    - c. Euco Epoxy 463 or 615; Euclid Chemical Company
    - d. Patch and Bond Epoxy; The Burke Company
    - e. Sure-Poxy; Kaufman Products, Inc.
    - f. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- G. Subfloor Patching and Leveling: The following manufacturers' products have been used establish minimum standards for materials, workmanship and function:
1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
    - a. Ardex K-15; Ardex Engineered Cements 400 Ardex Park Drive Aliquippa, PA 15001; (724) 203-5000
    - b. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

### **PART 3 - EXECUTION**

#### **3.1 PROPORTIONING AND DESIGN OF MIXES**

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete as indicated on drawings and schedules.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.
- E. Admixtures:
  1. Use water-reducing admixture in all concrete for ease of placement and workability.
  2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F.
  3. Use air-entraining admixture in all concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 6% with a tolerance of plus-or-minus 1-1/2%.
- F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
  1. Ramps, slabs and sloping surfaces: 3" to 5".

2. Reinforced foundation systems: 2" to 5".
3. Other concrete: 3" to 5".

### **3.2 CONCRETE MIXES**

- A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.
  1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.
  2. When air temperature is between 85 degrees F and 90 degrees, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

### **3.3 FORMS**

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
- B. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms to sizes, shapes, lines and dimensions shown and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, off-sets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses and the like, to prevent swelling and for easy removal.
- E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set time to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- G. Form Ties: Factory-fabricated, adjustable-length, removable, or snap-off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.
  1. Unless otherwise indicated, provide ties so portion remaining within concrete after removal is 1" inside concrete and will not leave holes larger than 1" diameter in concrete surface.
- H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.
- I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

### **3.4 PLACING REINFORCEMENT**

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice and other materials which reduce or destroy bond with concrete.



- C. Accurately position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers as required.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

### **3.5 JOINTS**

- A. Construction Joints: Locate and install construction joints as indicated, or if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect.
  - 1. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints.
- B. Isolation Joints in Slabs-On-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs on ground and vertical surfaces, such as column pedestals, and elsewhere as indicated.
  - 1. Joint filler and sealant materials are specified in Division-7 sections of these specifications.
- C. Construction Joints in Slabs-On-Ground: Construct construction joints in slabs-on-ground to form panels of patterns no larger than 600 square feet and as shown and as detailed. An alternative control joint detail may be inserts 1/8" to 1/4" wide x 1/4 of slab depth.
  - 1. Form contraction joints by inserting premolded plastic, hardboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris, fill groove with joint sealant.
  - 2. Joint sealant material is specified in Division-7 sections of these specifications.

### **3.6 INSTALLATION OF EMBEDDED ITEMS**

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface.
  - 1. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

### **3.7 PREPARATION OF FORM SURFACES**

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.
- B. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.
- C. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

### **3.8 CONCRETE PLACEMENT**

- A. Replacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately

before placing concrete where form coatings are not used.

1. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.
- B. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete", and as herein specified.
  1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
  1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.
  2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
  1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  2. Bring slab surfaces to correct level with straightedge and strike-off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
  3. Maintain reinforcing in proper position during concrete placement operations.
- E. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
  1. When air temperature has fallen to or is expected to fall below 40 degrees F uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F. and not more than 80 degrees F at point of placement.
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Do not place concrete when air temperature has fallen to or is expected to fall below 35 ° F. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
- F. Hot Weather Placing:
  1. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACE 305 and as herein specified.
  2. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

3. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
4. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.
5. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

### **3.9 FINISH OF FORMED SURFACES**

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete such as waterproofing, dampproofing. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Smooth Rubbed Finish: For formed concrete surfaces exposed to view provide smooth rubbed finish, not later than one day after form removal.
  1. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### **3.10 MONOLITHIC SLAB FINISHES**

- A. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for randomly trafficked floor surfaces:
  1. Specified overall values of flatness, F(F) 38: and levelness, F(L) 25: with minimum local values of flatness, F(F) 19: levelness, F(L) 13: for slabs on grade.
- B. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo and other bonded applied cementitious finish flooring material, and as otherwise indicated.
- C. Slope surface uniformly to drains where required. After leveling, roughen surfaces before final set, with stiff brushes, brooms or rakes.
- D. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing membrane or elastic roofing, or sand-bend terrazzo, and as otherwise indicated.
  1. After screeding consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- E. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint or other thin film finish coating system.

1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance. Grind smooth surface defects which would telegraph through applied floor covering system.
- F. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps and elsewhere as indicated.
  1. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

### **3.11 CONCRETE CURING AND PROTECTION**

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
  1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Keep continuously moist for not less than 7 days.
  2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least seven (7) days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
  1. Provide moisture curing by one of the following methods or by a combination of the following methods:
    - a. Keep concrete surface continuously wet by covering with water.
    - b. Continuous water-fog spray.
    - c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
- C. Provide moisture-cover curing as follows:
  1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- D. Provide curing and sealing compound to interior slabs with resilient flooring, carpet over cushion, or left exposed; and to exterior slabs, walks, and curbs as follows:
  1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within two hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.
- E. Do not use membrane curing compounds on surface which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, damp-proofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting and other coatings and finish materials, unless otherwise acceptable to Architect.
- F. Curing Formed Surfaces: Cure formed concrete surfaces, by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- G. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.

- H. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.
- I. Sealer and Dust-proofer: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

### **3.12 REMOVAL OF FORMS**

- A. Formwork not supporting weight of concrete, such as sides of walls, and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees F for twenty-four (24) hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided cutting and protection operations are maintained.
- B. Formwork supporting weight of concrete, may not be removed in less than fourteen (14) days and until concrete has attained design minimum compressive strength of in place concrete by testing field-cured specimens representative of concrete location in members.
- C. Form facing material may be removed four (4) days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

### **3.13 RE-USE OF FORMS**

- A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

### **3.14 MISCELLANEOUS CONCRETE ITEMS**

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
- D. Reinforced Masonry: Provide concrete grout for reinforced masonry, masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

### **3.15 CONCRETE SURFACE REPAIRS**

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms when acceptable to Architect.
  - 1. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
  - 2. For exposed to view surfaces, blend white portland cement and standard portland cement so that when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

- B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.
1. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets and other objectionable conditions.
  2. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
  3. Correct low areas in unformed surfaces during, or immediately after, completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.
  4. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and exposed reinforcing steel with at least 3/4" clearance all around.
  5. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
  6. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than seventy-two (72) hours.
  7. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.
  8. Repair methods not specified above may be used, subject to acceptance of Architect.

### **3.16 QUALITY CONTROL TESTING DURING CONSTRUCTION**

- A. The Owner will employ and pay for a testing laboratory to perform tests and to submit test reports. The Contractor shall notify testing agency 24 hours in advance of requirements.
- B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.
- C. The Owner shall maintain equipment on site to cast cylinders, perform slump and air tests, and field cure specimens. Should the project testing agency be absent from the site, the Contractor will be responsible for performing the field tests below.
- D. Sampling Fresh Concrete: ASTM C 172, except as modified for slump to comply with ASTM C 94.

1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
  2. Concrete Temperature: Test hourly when air temperature is 40 degrees F. and below, and when 80 degrees F. and above; and each time a set of compression test specimens made.
  3. Compression Test Specimen: ASTM C 31; one set of four (4) standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
- E. Compressive Strength Tests: ASTM C 39; one set for each day's pour plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at seven (7) days, two specimen tested at twenty-eight (28) days, and one specimen retained in reserve for later testing if required. Minimum compressive strength of concrete shall be 3,000 psi at 28 days unless otherwise indicated.
1. When frequency of testing will provide less than five (5) strength tests for a given class of concrete, conduct testing from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.
  2. When total quantity of a given class of concrete is less than 50 cu. yds., strength test may be waived by Architect if, in his judgment, adequate evidence of satisfactory strength is provided.
  3. When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
  4. Test results shall be reported in writing to Architect and Contractor within twenty-four (24) hours that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at twenty-eight (28) days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.
- F. Nondestructive Testing: Impact hammer, sonoscope, or other non- destructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- G. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
1. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

**END OF SECTION**

## SECTION 03368 - UV FLOOR SYSTEM (SEALED CONCRETE)

### PART I – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes UV Floor Systems for interior concrete floors denoted on Finish Floor Schedule as SC (Sealed Concrete) or UVFS (UV Floor System). UV Floor System finished for pre- cast concrete, vertical cast-in-place concrete, and exterior concrete are specified in the sections for those types of concrete.
- B. Furnish all labor, material, equipment and services necessary for the dry diamond grinding and UV Floor Systems of concrete floors.
- C. Applying densifying impregnator/UV Floor Sealer and grinding to specified sheen level and aggregate exposure.
- D. Concrete must be cured a minimum of 28 days prior to installation of UV Floor System.

#### 1.3 REFERENCES

- A. American Concrete Institute (ACI):
- B. American Society for Testing and Materials
  - 1. ASTM C779, Standard Test Method for Abrasion of Horizontal Concrete Surfaces.
  - 2. ASTM C805, Impact Strength
  - 3. ASTM G23-8, Ultraviolet Light and Water Spray
  - 4. ASTM 1028-07e1, Co-Efficient of Friction
  - 5. ASTM C 150, Type I, II Portland cement conformity, depending on soil conditons
  - 6. ASTM C33, Aggregate conformity
  - 7. ASTM D4060-10, Abrasion Resistance of Organic Coatings by the Taber Abraser.
  - 8. ASTM C1583-13, Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull- off Method)

#### 1.4 SUBMITTALS

- A. Submit the following in accordance with submittal Procedures in Division 1 Sections.
- B. Product data for concrete densifying impregnator, UV sealer, concrete dyes, joint filler and any other chemicals used in the process.
- C. Applicators qualification data.
- D. UV concrete samples: size 3"x3" for each UV Concrete finish required.



## 1.5 QUALITY ASSURANCE

- A. Basis of design. UV Floor System
- B. Certified Contractors:
  - 1. Pre-qualified contractors meeting ALL requirements set forth within specifications.
  - 2. No substitutions will be allowed or approved.
- C. Pre –Pour Installations Conference: conduct conference at project site to comply with requirements in Division 1 Sections “Special Conditions” and Administrative Requirements.
- D. Manufacturer’s Certification: Provide letter of certification stating that the installer is a Bavara DOI certified applicator and is familiar with proper procedures and installation requirements recommended by the manufacturer.
- E. Mock-Ups:
  - 1. Mock ups to be approximately 100 square feet per color and UV finish in location indicated or if not indicated, as directed by the Architect or Owner Representative.
  - 2. Install mock-ups to verify selections make under sample submittal and to demonstrate methods and “workmanship proposed for the project. If mock-up not possible, submitted samples will be accepted as demonstrated methods and workmanship.
  - 3. Control joints should be included in mock-up. Sawing performed by General Contractor can begin as soon as the surface is firm enough not to displace any of the aggregate.
  - 4. Edges should be included in mock-up.
- F. Protection: General contractor shall protect areas to receive UV Floor System finish at all times during construction to prevent oils, dirt, metal, excessive water and other potentially damaging materials from affecting the finished concrete surface. Protection measures listed below shall begin immediately after the concrete slab is poured.
  - 1. All hydraulic powered equipment shall be diapered to avoid staining of the concrete.
  - 2. All vehicle parking shall be prohibited on the finish slab area. If necessary to complete their scope of work, drop clothes shall be placed under vehicles at all times.
  - 3. No pipe cutting machine shall be used on the finish floor slab.
  - 4. Steel shall not be placed on the finish slab to avoid rusting.
  - 5. Acids and acidic detergents will not come in contact with slab.
  - 6. All painters will use drop cloths on the concrete. If paint gets on the concrete, it must be removed immediately.
  - 7. All trades will be informed that the slab must be protected at all times
- G. Environmental Limitations
  - 1. Comply with manufacturers written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation and other conditions affecting chemical performance.
  - 2. Flatness and Levelness
    - a. Finished concrete shall have a minimum Floor Flatness rating of at least 40
    - b. Finished concrete shall have a minimum floor Levelness rating of at least 30

- c. Finished concrete shall be cured a minimum of 28 days or at which point equipment can be put on the slab and does not displace aggregate.
- 3. Finished concrete area shall be closed to traffic during UV Floor System application and after application, for the time as recommended by the manufacturer.

#### H. Concrete Mix Design

- 1. Concrete Mixture shall be 3000 PSI or higher, non-air entrained.
  - a. Any admixtures, plasticizers, slag, fly ash or anything taking the place of Portland based cement shall be kept to a minimum.
  - b. The cement shall be Portland Cement Type I, conforming to ASTM C150.
  - c. Maintain concrete temperature below 85 degrees. Keep concrete cool and moist for as long as possible. In essence, decrease rate of hydration and drying to minimizing crackling.
  - d. A dissipating cure and seal may be used if required.
  - e. All mix designs must be approved by the Architect. Send all approved mix designs to Installer/Applicator.
  - f. The Engineer/Architect shall determine the saw cut pattern, color and layout.
  - g. Color loads for integral color should never be smaller than three (3) cubic yards.
  - h. Use on (1) source for cement, aggregates, and pozzolans throughout the job. Monitor and control incoming material consistency. Do not use calcium chloride- based admixtures. Non-chloride admixtures may be used.
  - i. Wash out all drums before loading. Keep slumps consistent with a maximum of four (4). Minimize driver added water maintaining a .45 water content ratio.
  - j. Place concrete to achieve as true and smooth of a top surface as possible. Mounds or dips are not acceptable. General contractor shall control overall flatness and levelness, including on sloping areas to within tolerances permitted by specification ASTM E1155.
  - k. Slab shall be protected from indentation and footprints during pour and curing.

## PART 2- PRODUCTS

### 2.1 GRINDING AND UV MATERIALS

- A. Three-phase 480 Volt Generator
- B. Three (3) head or four (4) head counter rotating, variable speed, electric floor grinding/polishing machines with at least 600 pounds down pressure.
- C. Ultraviolet Curing Equipment.
- D. HTC/Pullman Ermator Dust Extraction System, pre separator and squeegee attachments with minimum flow rating of 322 cubic feet per minute. NO substitutes allowed.
- E. Grinding Tools
  - 1. Metal bond diamonds

- F. Grinding Pads for Edges
  - 1. Metal bond
- G. Hand Grinder with dust extraction attachment and pads.
- H. Densifier: A concrete hardener chemically reactive, waterborne solution of inorganic silicate or siliconize materials and proprietary components, odorless, colorless which hardens and densifies concrete surfaces to protect against abrasion, dusting, and absorption of liquids.
  - 1. Ultrasil LI, Lithium Silicate; The Euclid Chemical Company
  - 2. Scofield Formula One Lithium Densifier; L.M. Scofield Company
  - 3. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening
- I. Control Joint and Sawcut Filler, two part polyurea.
  - 1. Spal-Pro RS88 Semi-Rigid Polyurea Joint Filler; Metzger-McGuire
  - 2. Hi-Tech Polyurea PE-85, Hi-Tech systems
  - 3. Euco Quick-Joint 200, The Euclid Chemical Company
  - 4. NO substitutions allowed.
- J. Dye: A penetrating dye that chemically combines with cured concrete to produce permanent, variegated or translucent color effects. SOLVENT BASED FORMULAS ONLY.
  - 1. Ameripolish Surelock Dye; American Decorative Concrete
  - 2. Scofield formula One Liquid Dye concentrate; L.M. Scofield Company
  - 3. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening
- K. (If specified) Floor Striping material and layout to be specified by owner/architect.
- L. UV Coating: Bavara DOI – UV Clear; Desko International, Inc.
  - 1. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

## PART 3- EXECUTION

### 3.1 PREPARATION

- A. Installer shall examine and approve concrete substrate for conditions affecting performance of UV Floor System Finish. General contractor shall correct conditions that area found to be out of compliance with the requirements of this section.  
Repairs are acceptable unless specifically approved on a case-by-case basis by the Architect.

- B. Verify that base slab meets finish and surface profile requirements listed in Division 3, Section “ Cast in Place Concrete”
- C. Provide floor clean of materials and debris
- D. Protect adjacent surfaces as required to prevent damage by the concrete polishing procedure.
- E. Set up grinding machine, dust extraction system, tooling and generator.  
Ensure floor cured to accept UV Floor System Installation application

### 3.2 UV FLOOR SYSTEM APPLICATION

- A. Applicator shall examine the areas and conditions under which work of this section will be provided and the General contractor shall correct conditions detrimental to the timely and proper completion of the work and the Applicator shall not proceed until unsatisfactory conditions are resolved.
- B. Fill construction joints and cracks with filler products as specified in accordance with manufacturer's instructions colored to match (or contrast) with concrete color as specified by architect. All control joint and decorative saw cut filling must be performed prior to grinding application.
- C. Grind the concrete floor to within 2-3 inches of walls removing construction debris and achieve uniform scratch pattern.
- D. Grind the edges with grinding pads, prior to grinding the floor with each step on the larger diamond grinder, removing all the scratches from the previous grit. Vacuum the floor thoroughly after each grind using a squeegee vacuum attachment.
- E. (If specified) Apply dye color per manufacturer's recommendations. Apply two (2) coats of dye to achieve desired coloration.
- F. Apply densifying impregnator undiluted as per manufacturer's specifications and guidelines.
- G. Apply Bavara UV Floor Coating per manufacturer's instructions.
- H. Upon Completion, the work shall be ready for final inspection and acceptance by the client.

END OF SECTION

## **SECTION 04200 - UNIT MASONRY**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Extent of each type of masonry work is indicated on drawings and schedule.
- B. Types of masonry work required include.
  - 1. Concrete unit masonry.
  - 2. Brick masonry.

#### **1.3 QUALITY ASSURANCE**

- A. Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E 119 by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.
- B. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- C. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- D. Samples: Submit the following samples:
  - 1. Unit masonry samples for each type of exposed masonry unit required; include in each set the full range of exposed color and texture to be expected in completed work.
  - 2. Include size variation data verifying that actual range of sizes for brick falls within ASTM C652 dimension tolerances for brick where modular dimensioning is indicated. The grade shall be SW and the type HBS.
- E. Field Constructed Mock-Up Panel: Prepare mock-up panel for the following types of masonry. Purpose of mock-up is further verification of selections made for color and finish under sample submittals and establishing standard of quality for aesthetic effects expected in completed work. Build mock-up panel to comply with the following requirements:
  - 1. Locate mock-up panel on site where directed by the Architect.
  - 2. Build mock-up panel of typical exterior masonry wall, approximately 4'-0" long by 4'-0" high, showing all typical components, connections, attachments to building structure and methods of installation.
  - 3. Retain mock-up panel during construction as standard for judging completed masonry work. When directed, demolish mock-up panel and remove from site.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes. Store masonry units off the ground.
- C. Store cementitious materials off the ground, under cover and in dry location.
- D. Store aggregates where grading and other required characteristics can be maintained.

- E. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

## **1.5 PROJECT CONDITIONS**

- A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.
- B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- C. Do not apply uniform floor or roof loading for at least 24 hours after building masonry walls or columns.
- D. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- E. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
- F. Protect sills, ledges and projections from droppings of mortar.
- G. Environmental Protection:
  - 1. Maintain air temperature and materials to a minimum of 40 degrees F and a maximum of 90 degrees F prior to and during masonry work
  - 2. Do not lay masonry units which are wet or frozen.
  - 3. Remove masonry damaged by freezing conditions.
- H. For clay masonry units with initial rates of absorption (suction) which require them to be wetted before laying, comply with the following requirements.
  - 1. For units with surface temperatures above 32°F wet with water heated to above 70°F.
  - 2. For units with surface temperatures below 32°F wet with water heated to above 130°F.

## **PART 2 - PRODUCTS**

### **2.1 CONCRETE MASONRY UNITS**

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
  - 1. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.
  - 2. Provide bullnose units for outside corners, except where indicated as square-edged.
- B. Concrete Block: Provide units complying with characteristics indicated below for Grade, Type, face size, exposed face and under each form of block included, for weight classification.
  - 1. Grade N
  - 2. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high x thickness indicated.
  - 3. Type I: moisture-controlled units.
  - 4. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
  - 5. Hollow Loadbearing Block: ASTM C 90 and as follows:
    - a. Weight Classification: Lightweight
  - 6. All CMU sills shall be bullnose concrete block, unless another material is indicated on the drawings. If the sills are indicated to receive another material (ie: Solid Surface fabrication, wood, etc.) placed on top of the CMU sill, the CMU sill shall be straight edged concrete block units.

## 2.2 BRICK MADE FROM CLAY OR SHALE

- A. MANUFACTURERES: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. ACME Brick Company, Montgomery, AL
  - 2. Boral Bricks, Phenix City, AL
  - 3. Henry Brick Company, Selma, AL
  - 4. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.
- C. Provide special molded shapes where indicated and for application requiring brick of form, size and finish on exposed surfaces which cannot be produced from standard brick sizes by sawing.
- D. For sills, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncured or unfroged units with all exposed surfaces finished.
- E. Facing Brick: Submit samples for approval of equals prior to bids. Eased edge brick shall not be allowed.
- F. BRICK ALLOWANCES
  - 1. *Face Brick* shall have a value of **\$550.00 dollars per thousand** (Allowances shall be for material only, based on actual number of bricks purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses brick of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.
  - 2. *Accent Brick* shall have a value of **\$550.00 dollars per thousand** (Allowances shall be for material only, based on actual number of bricks purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses brick of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.

## 2.3 MORTAR AND GROUT MATERIALS

- A. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. Atlas
  - 2. Citadel
  - 3. Lone Star
  - 4. Magnolia
  - 5. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. Masonry Cement: ASTM C 91.
  - 1. Type S for CMU walls
  - 2. Type N for Exterior Face and Accent brick – color pigment.
- C. ALLOWANCES:
  - 1. *Face and Accent Brick* to have a value of **\$18.50 dollars per bag**. (Allowances shall be for material only, based on actual number of bags purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses mortar of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.

- D. Hydrated Lime: ASTM C 207, Type S.
- E. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.
- F. Water: Clean and potable.

## **2.4 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES**

- A. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. Dur-O-Wall, Inc.
  - 2. Heckman Building Products, Inc.
  - 3. Masonry Reinforcing Corp. of America.
  - 4. National Wire Products Corp.
  - 5. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics.
- C. Use individual galvanized steel metal ties installed in horizontal joints to bond wythes together **only** where wood or metal stud backup occurs. Provide ties as shown, but not less than one metal tie for 4 sq. ft. of wall area spaced not to exceed 24" o.c. horizontally and vertically. Stagger ties in alternate courses. Provide additional ties within 1'-0" of all openings and space not more than 3'-0" apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24" o.c. vertically.
- D. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 123, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.
- E. Application: Use where indicated.
- F. Joint Reinforcement: Provide truss-type, welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below:
  - 1. Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" else- where.

## **2.5 EMBEDDED FLASHING MATERIALS**

- A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
  - 1. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet.
  - 2. Provide splice plates at joints of formed, smooth metal flashing.
  - 3. Fabricate through-wall metal flashing embedded in masonry from, with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.
  - 4. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
  - 5. Fabricate through-wall flashing with drip edge where indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees.
  - 6. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 3/8 inch to form a stop for retaining sealant backer rod.



7. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam will shed water.
  8. Metal Drip Edges: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees.
  9. Metal Flashing Terminations: Fabricate from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 3/8 inch to form a stop for retaining sealant backer rod.
  10. Metal Expansion-Joint Strips: Fabricate from stainless steel to shapes indicated.
- B. Flexible Flashing: For flashing not exposed to the exterior, use one of the following, unless otherwise indicated:
1. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy as follows:
    - a. Monolithic Sheet: Elastomeric thermoplastic flashing, 0.040 inch thick.
    - b. Self-Adhesive Sheet: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015-inch thick coating of rubberized-asphalt adhesive.
    - c. Self-Adhesive Sheet with Drip Edge: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015-inch thick coating of rubberized-asphalt adhesive. Where flashing extends to face of masonry, rubberized-asphalt coating is held back approximately 1-1/2 inches from edge.
    - d. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
  2. EPDM Flashing: Sheet flashing product made from ethylene-propylene-dieneterpolymer, complying with ASTM D 4637, 0.040 inch thick.
- C. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
- D. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship, and function:
1. Vinyl Sheet Flashing: (Thickness: 20 mils)
    - a. Vi-Seal Plastic Flashing; Afco Products, Inc.
    - b. BFG Vinyl Water Barrier; B.F. Goodrich Co.
    - c. Nuflex; Sandell Manufacturing Co., Inc.
    - d. Wascosea"; York Manufacturing, Inc.
    - e. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

## 2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. See drawings for locations of all required control joints.
- B. Non-Metallic Expansion Joint Strips: Pre-molded, flexible cellular neoprene rubber filler strips complying with ASTM D 1056, Grade RE41E1, capable of compression up to 35%, of width and thickness indicated.
- C. Premolded Control Joint Strips: Material as indicated below designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
1. Polyvinyl chloride complying with ASTM D 2287, General Purpose Grade, Designation PVC-63506.

- D. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Mortar Net Solutions; Mortar Net with Insect Barrier or comparable product by one of the following:
    - a. Advanced Building Products Inc.
    - b. Heckmann Building Products, Inc.
    - c. Wire-Bond.
  - 2. Configuration: Provide one of the following:
    - a. Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.

## **2.7 MASONRY CLEANERS**

- A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2 cup dry measure) and laundry detergent (1/2 cup dry measure) dissolved in one gallon of water.

## **2.8 MORTAR AND GROUT MIXES**

- A. General: Do not add admixtures including air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
- B. Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.
  - 1. For Exterior Brick, use Type N mortar, equal to Flamingo, Blue Circle or Lehigh.
  - 2. For Other Masonry Units use Type S mortar without coloring pigment.

# **PART 3 - EXECUTION**

## **3.1 INSTALLATION, GENERAL**

- A. Wetting Clay Brick: Wet brick made from clay or shale which have ASTM C 67 initial rates of absorption (suction) of more than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated but surface dry when laid.
- B. Do not wet concrete masonry units.
- C. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.
- D. Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown. Build single wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.
- E. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.
- F. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- G. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

1. Use wet cutting saws to cut concrete masonry units.

### **3.2 LAYING MASONRY WALLS**

- A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.
- B. Coursing and Bonding:
  1. **All CMU shall be Running Bond.**
- C. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.
- D. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.
  1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

### **3.3 MORTAR BEDDING AND JOINTING**

- A. Lay masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.
- B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.
- C. Maintain joint width shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.
- D. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- E. Tool all exposed joints, except where otherwise indicated, slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- F. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

### **3.4 STRUCTURAL BONDING OF MULTI-WYTHE MASONRY**

- A. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes. Install at not more than 16" o.c. vertically.
- B. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.
  1. For horizontally reinforced masonry, provide continuity at corners with prefabricated "L" units, in addition to masonry bonding.
- C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as shown below:
  1. At juncture of interior partitions and exterior walls, rake and caulk vertical joint.
  2. Provide metal ties as shown below.
  3. Provide individual metal ties at not more than 16" o.c. vertically.
  4. Provide continuity with horizontal joint reinforcement using prefabricated "T" units.

- D. Intersecting Load-bearing Walls: If carried up separately, block or tooth vertical joint with 8" maximum offsets and provide rigid steel anchors spaced not more than 4'-0" o.c. vertically, or omit blocking and provide rigid steel anchors at not more than 2'-0" o.c. vertically. Form anchors of galvanized steel not less than 1-1/2" x 1/4" x 2'-0" long with ends turned up not less than 2" or with cross-pins. If used with hollow masonry units, embed ends in mortar-filled cores.
- E. Non-bearing Interior Partitions: Build full height of story to underside of roof structure above, unless otherwise shown.

### **3.5 CAVITY WALLS**

- A. Keep cavity clean of mortar droppings and other materials during construction. Strike joints facing cavity flush.
- B. Tie exterior wythe to new back-up with continuous horizontal joint reinforcing, installed in mortar joints at not more than 16" o.c. vertically.
- C. Provide weep holes (Open Head Joints) in exterior wythe of cavity wall located as directed on the drawings, spaced 32" o.c., unless otherwise indicated.

### **3.6 CAVITY WALL INSULATION**

- A. On units of plastic insulation, install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
  - 1. Fill all cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

### **3.7 HORIZONTAL JOINT REINFORCEMENT**

- A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls, 1/2" elsewhere. Lap reinforcing a minimum of 6".
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Reinforce walls with continuous horizontal joint reinforcing unless specifically noted to be omitted.
- D. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.
  - 1. In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

### **3.8 CONTROL AND EXPANSION JOINTS**

- A. General: Provide vertical and horizontal expansion, control and isolation joints in masonry where shown. Build-in related items as the masonry work progresses.

### **3.9 LINTELS**

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide formed-in-place masonry lintels. Temporarily support formed-in-place lintels.
- C. Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

### **3.10 FLASHING OF MASONRY WORK**

- A. General: Provide concealed flashing in masonry work at, or above shelf angles, lintels, ledges and other obstructions to the down-ward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and turn down to form drip.
- B. Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2". At heads and sills turn up ends not less than 2" to form a pan.
- C. Interlock end joints of deformed metal flashings by over-lapping deformations not less than 1-1/2" and seal lap with elastic sealant.
- D. Install flashing to comply with manufacturer's instructions.
- E. Provide weep holes (open head joints) in the head joints of the first course of masonry immediately above concealed flashings. Space weep holes 32" o.c., unless otherwise indicated.

### **3.11 REPAIR, POINTING AND CLEANING**

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point- up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  - 3. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.
  - 4. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clean water.
  - 5. Use bucket and brush hand cleaning method described in BIA "Technical Note No. 10 Revised" to clean brick masonry made from clay or shale, except use masonry cleaner indicated below.
    - a. Detergent
  - 6. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

### **END OF SECTION**

## **SECTION 05500 - MISCELLANEOUS STEEL AND METAL FABRICATIONS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Definition: Metal fabrications include items made from iron and steel shapes, plates bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere.
- B. Extent of metal fabrications is indicated on drawings and schedules.
- C. Types of work in this section include metal fabrications for:
  - 1. Rough hardware.
  - 2. Nosing.
  - 3. Loose bearing and leveling plates.
  - 4. Loose steel lintels.
  - 5. Miscellaneous framing and supports.
  - 6. Miscellaneous steel trim.
  - 7. Shelf angles.
  - 8. Steel railings.
  - 9. Pipe Bollards.

#### **1.3 QUALITY ASSURANCE**

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in miscellaneous metal fabrications, including paint products and grout.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.
  - 1. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis.
- C. Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by Architect.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

##### **A. FERROUS METALS**

- 1. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- 2. Steel Structural, Shapes and Bars: ASTM A 36, wide flange, ASTM A572, fy50ks.

3. Steel Tubing: Hot-rolled, ASTM A 500. FY=46KSI
4. Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.
5. Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.
6. Steel Pipe: ASTM A 53; Type and grade (if applicable) as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.
7. Gray Iron Castings: ASTM A 48, Class 30.
8. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.
9. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
10. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.
11. Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

#### B. FASTENERS

1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
3. Lag Bolts: Square head type, FS FF-B-561.
4. Machine Screws: Cadmium plated steel, FS FF-S-92.
5. Wood Screws: Flat head carbon steel, FS FF-S-111.
6. Plain Washers: Round, carbon steel, FS FF-W-92.
7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
8. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
9. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

#### C. PAINT:

1. Shop Primer for Ferrous Metal: Manufacturer's or Fabricator's standard, fast-curing, lead-free, "universal" primer; selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.
2. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, complying with the Military Specifications MIL-P-21035 (Ships) or SSPC-Paint-20.

#### D. CONCRETE FILL:

1. Concrete Materials and Properties: Comply with requirements of Division-3 section "Concrete Work" for normal weight, ready-mix concrete with minimum 28-day compressive strength of 3000 psi, and W/C ratio of 0.58 maximum, unless higher strengths indicated.
2. Non-Slip Aggregate Finish: Factory-graded, packaged material containing fused aluminum oxide grits or crushed emery as abrasive aggregate; rust-proof and non-glazing; unaffected by freezing, moisture or cleaning materials.

## **2.2 FABRICATION - GENERAL**

- A. Workmanship: Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts.
- E. Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- F. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- G. Galvanizing: Provide a zinc coating for those items indicated or specified to be galvanized, as follows:
  - 1. ASTM A\_ 153 for galvanizing iron and steel hardware.
  - 2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
  - 3. ASTM A\_ 386 for galvanizing assembled steel products.
- H. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- I. Shop Painting:
  - 1. Apply shop primer to surfaces of metal fabrications except those which are galvanized or as indicated to be embedded in concrete or masonry, unless otherwise indicated, and in compliance with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.
    - a. Stripe paint all edges, corners, crevices, bolts, welds and sharp edges.
- J. Surface Preparation: Prepare ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
  - 1. Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast cleaning".
  - 2. Interior (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning".

## **2.3 ROUGH HARDWARE**

- A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division-6 sections.
- B. Fabricate items to sizes, shapes and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

## **2.4 LOOSE STEEL LINTELS**

- A. Provide loose structural steel lintels for openings and recesses in masonry walls and partitions as shown and scheduled. Weld adjoining members together to form a single unit where indicated.



Provide not less than 8" bearing at each side of openings, unless otherwise indicated. All steel lintels shall be hot-dipped galvanized steel.

## **2.5 MISCELLANEOUS FRAMING AND SUPPORTS**

- A. Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete work.
- B. Fabricate miscellaneous units to sizes, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
- C. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
  - 1. Except as otherwise indicated, space anchors 24" o.c. and provide minimum anchor units of 1-1/4" x 1/4" x 8" steel straps.

## **2.6 FABRICATION - STEEL RAILINGS AND HANDRAILS**

- A. Structural Performances: Provide assemblies which, when installed, comply with the following minimum requirements for structural performance, unless otherwise indicated.
  - 1. Handrails and Toprails: Capable of withstanding the following loads applied as indicated when tested per ASTM E 935.
  - 2. Concentrated Load: of 200lb applied at any point and any direction.
  - 3. Uniform load of 50 lb per linear ft. applied in any direction.
  - 4. Concentrated and uniform loads above need not be assumed to act concurrently.
  - 5. Guards: Intermediate rails, balusters and panel fillers capable of withstanding a uniform load of 25 lb per sq. ft. of gross area of guard, including any open areas, of which they are a part.
- B. Fabricate steel railings and handrails to design, dimensions, and details indicated. Provide railings and handrails members formed of steel tubing of shapes, sizes and wall thickness indicated, but not less than that required to support design loading.
- C. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
  - 1. At tee and cross intersections provide coped joints.
  - 2. At bends interconnect tubing by means of prefabricated elbow fittings or flush radius bends, as applicable, or radiuses indicated.
  - 3. At elbow bends provide mitered joints.
  - 4. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe, at fabricator's option.
- D. Form simple and compound curves by bending tubing in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
- E. Provide wall returns at ends of wall-mounted handrails, except where otherwise indicated.
- F. Close exposed ends of pipe by welding 3/16" thick steel plate in place or by use of prefabricated fittings.
- G. Toe Boards: Where indicated, provide toeboards at railings around openings and at the edge of open-sided floors and platforms. Fabricate to dimensions and details indicated, or if not indicated, use a 4" high x 1/8" plate welded to, and centered between, each railing post.
- H. Brackets, Flanges, Fittings and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and

handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.

1. For railing posts sets in concrete provide sleeves of galvanized steel pipe not less than 6" long and with an inside diameter not less than 1/2" greater than the outside dimensions of tubing. Provide steel plate closure welded to bottom of sleeve and of width and length not less than 1" greater than outside diameter of sleeve.
- I. Stair Railings and Handrails: Comply with applicable requirements specified elsewhere in this section for steel railings and handrails, and as follows:
  1. Railings may be bent at corners, rail returns and wall returns, instead of using prefabricated fittings.
  2. Connect railing posts to stair framing by direct welding, unless otherwise indicated.

## **2.7 IMPACT BOLLARDS**

- A. Provide concrete filled steel pipe bollards as indicated on drawings as follows:
  1. Unless otherwise indicated, bollards are to be 4" Schedule 40 steel pipe.
  2. Locate bollards as indicated on drawings. Install bollards such that they are vertically aligned and plumb so they do not appear to lean from any direction.
  3. Install pipe to depth and heights as indicated on drawings.
  4. Pipe to be bedded and filled with concrete with hand-formed domed cap, as indicated on drawings.
  5. Prime and Paint pipe bollards. Color to be selected by architect.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
- B. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

### **3.2 INSTALLATION - GENERAL**

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plus, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete masonry or similar construction.
  1. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- C. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

- D. Setting Loose Plates: Clean concrete and masonry bearing surfaces of any bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
1. Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with the edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic non-shrink grout in exposed locations, unless otherwise indicated.

### **3.3 INSTALLATION - STEEL RAILINGS AND HANDRAILS**

- A. Adjust railing prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated, or if not indicated, as required by design loadings. Plumb posts in each direction. Secure posts and railing ends to building construction as follows:
1. Anchor posts in concrete by means of sleeves preset and anchored into concrete. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with non-shrink, non-metallic grout, mixed and placed to comply with grout manufacturer's directions.
  2. Leave anchorage joint exposed; wipe off excess grout and level 1/8" build-up, sloped away from post. For installation exposed on exterior or to flow of water, seal grout to comply with grout manufacturer's directions.
- B. Secure handrails to wall with wall brackets and end fittings. Provide bracket with not less than 1-1/2" clearance from inside face of handrail and finished wall surface. Locate brackets as indicated, or if not indicated, at spacing required for design loading. Secure wall brackets and wall return fittings to building construction as follows:
1. Use type of bracket with pre-drilled hole for exposed bolt anchorage.
  2. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.
  3. For hollow masonry anchorage, use toggle bolts having square heads.
  4. For stud partitions use lag bolts set into wood backing between studs. Coordinate with stud installations for accurate location of backing members.
- C. Expansion Joints: Provide expansion joints at locations indicated, or if not indicated, at intervals not to exceed 40 feet. Provide slip joint with internal sleeve extending 2" beyond joint on either side; fasten internal sleeve securely to one side; locate joint within 6" of posts.
- D. Cast Treads and Thresholds: Install cast treads and thresholds with anchorage system indicated to comply with manufacturer's recommendations. Seal units exposed to exterior mastic to provide a watertight installation.

### **3.4 ADJUST AND CLEAN**

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting.
- B. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- C. For galvanized surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

### **END OF SECTION**

## **SECTION 05540 - METAL STUDS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Types of work include:
  - 1. Light-gage metal support system for installation of gypsum and other materials.

#### **1.3 QUALITY ASSURANCE**

- A. Fire-Resistance Ratings: Where gypsum drywall systems with fire- resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories acceptable to authorities having jurisdiction.
  - 1. Provide fire-resistance rated assemblies identical to those indicated by reference to GA File No.'s. in GA "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's product specifications and installation instructions, including other data as may be required to show compliance with these specifications.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store material inside under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. Mill Steel Company; 2905 Lucerne Dr SE, Grand Rapids, MI 49546; Phone: (812) 670-4195; [www.millsteel.com](http://www.millsteel.com).
  - 2. ClarkDietrich; 9050 Centre Pointe Dr., Suite 400, West Chester, OH 45069; Phone: (513) 870-1100; Fax: (513) 870-1300; Website: [www.clarkdietrich.com](http://www.clarkdietrich.com).
  - 3. MarinoWARE; 400 Metuchen Rd., South Plainfield, NJ 07080; Phone: (800) 627-4661; Website: [www.marinoware.com](http://www.marinoware.com).
  - 4. Cemco; 13191 Crossroads Pkwy. N. Suite 325, City of Industry, CA 91746; [www.cemcosteel.com](http://www.cemcosteel.com).
  - 5. Ironline, LLC; 300 Technology Drive, Walterboro, SC 29488; Phone: 800.308.5673; [www.ironlinemetals.com](http://www.ironlinemetals.com).
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect not less than Ten (10) days prior to scheduled bid opening.

## **2.2 METAL FRAMING**

- A. Fabrication: Fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A446, A570 or A611.
- B. Finish: Provide galvanized finish to metal framing components complying with ASTM A525 for minimum G60 coating.
- C. "C"-Shape Studs and Resilient Channels. Provide as follows:
  - 1. Manufacturer's standard 22 gauge at all interior gypsum board locations, size to be as noted on the drawings.
  - 2. Gauge at all exterior locations to be 18 gauge at exterior walls or as noted on the Structural Drawings, size to be as noted on the drawings.
  - 3. Resilient hat channels, 18 gauge, size as noted on the drawings.
- D. "C"H-Shape Studs: Provide manufacturer's standard 20 gauge unless otherwise noted on the Structural Drawings, size to be as noted on the drawings.
- E. Fastenings: Attach components by welding, bolting, or screw fastenings, as standard with manufacturers.

## **2.3 INSTALLATION**

- A. Manufacturer's Instructions: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, unless otherwise indicated.
- B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24" o.c. spacing for nail or power-driven fasteners, or 16" o.c. for other types of attachment. Provide fasteners at corners and ends of tracks.
  - 1. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
  - 2. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.
  - 3. Install supplementary framing, blocking and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.
- C. Installation of Wall Stud System: Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges.
  - 1. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame except where more than 2 are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.
  - 2. Frame both sides of expansion and control joints, with separate studs; do not bridge the joint with components of stud system.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Space framing member 24" o.c., unless noted otherwise on the drawings or by UL Classification.
- B. Install auxiliary framing at termination of drywall work, and at openings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.

C. Supplementary Supports:

1. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co.
2. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
3. Extend supplementary supports to the structural support system.
4. Frame openings to comply with details indicated or if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co. Attach vertical studs at jambs directly to frames; install runner track section (for jack studs) at head and secure to jamb studs.
5. Erect thermal insulation vertically. Until gypsum board is installed hold insulation in place with 18-gage tie wire or by an equally acceptable method.

**END OF SECTION**

## **SECTION 06100 - ROUGH CARPENTRY**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.
- B. Work Included: All wood, nails, bolts, screws, framing anchors and other rough hardware, and all other items needed for rough and finished carpentry in this work but not specifically described in other sections of these specifications.
- C. Quality Assurance: In addition to complying with all pertinent codes and regulations, all materials of this section shall comply with pertinent provisions of:
  - 1. Southern Pine Southern Pine Inspection Bureau Plywood 'Softwood Plywood - Construction and Industrial' (Amended June 1969), Product Standard PD 1-66 of U.S. Department of Commerce, Bureau of Standards, and A.P.A.
  - 2. Rough Hardware "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings of the American Institute of Steel Construction"
  - 3. Building Paper Federal Specification UU-B-790a, dated February 5, 1968
  - 4. Wood Preservative Standard P-5 of the American Wood Preservers Institute
  - 5. Other Similar and pertinent reference standards for the products needed.
- D. Conflicting Requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the provisions of the more stringent shall govern.
- E. Qualifications of Workmen: Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.
- F. Rejection: In the acceptance or rejection of rough carpentry, no allowance will be made for lack of skill on the part of workmen.

#### **1.2 PRODUCT HANDLING**

- A. Protection: Store all materials in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather.
  - 1. Use all means necessary to protect lumber materials before, during and after delivery to the job site, and to protect the installed work and materials of all other trades.
  - 2. Deliver the materials to the job site and store all in a safe area, out of the way of traffic, and shored up off the ground surface.
  - 3. Protect all metal products with adequate weather-proof outer wrappings.
  - 4. Use extreme care in the off-loading of lumber to prevent damage, splitting and breaking of materials.
  - 5. Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately stored to prevent its inadvertent use.
  - 6. Do not allow installation of damaged or otherwise non-complying material.
  - 7. Use all means necessary to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

## **PART 2 – MATERIALS**

### **2.1 MATERIALS - GENERAL**

- A. Grade Stamps:
- B. Framing Lumber: Identify all framing lumber by proper grade stamp.
- C. Plywood: Identify all plywood as to species, grade and glue type by the stamp of the American Plywood Association.
- D. Other: Identify all other materials of this section by the appropriate stamp of the agency listed in the reference standards, or by such other means as are approved in advance by the Architect.
- E. Moisture Content: Moisture content of any material for framing not to exceed 19% for boards 8" in width or less. Boards exceeding 8" in width not to exceed 15% at time of installation. All material used for finish and trim work to be kiln dried material with moisture content not to exceed that allowed by FHA for intended use.

### **2.2 MATERIALS - WOOD**

- A. All materials of this Section, unless specifically otherwise approved in advance by the Architect, shall meet or exceed the following:
  - 1. Plates, Grounds or furring
    - a. Pressure treated #2 KD Southern Yellow Pine in contact w/concrete, masonry or plaster
  - 2. All Framing Members
    - a. Lodge Pole Spruce #2 KD
  - 3. Wood Preservative
    - a. Ammonical copper arsenite or 5% solution of pentachlorophenol

### **2.3 MATERIALS – MISCELLANEOUS**

- A. All materials of this Section, unless specifically otherwise approved in advance by the Architect, shall meet or exceed the following:
  - 1. Steel Hardware
    - a. ASTM A-7 or A-36 (Use galvanized at exterior locations)
  - 2. Machine Bolts
    - a. ASTM A-307
  - 3. Lag Bolts
    - a. Federal Specifications FF-B-561
  - 4. Nails
    - a. Common (Except as noted) Federal Specifications FF-N-1-1 (Use galvanized at exterior locations)
  - 5. Flashing
    - a. Nervastral Seal Prof HD-20 except where metal is indicated. Nervastral Seal Prof HD shall be installed on all sills and heads ½" inward from outside face of wall and extended 6" on each side of opening brick veneer construction. The sheeting shall not be allowed to hang free prior to completion of brick work but shall be secured to the siding with nails and discs or furring strips.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**



- A. Stockpiling: Stockpile all materials sufficiently in advance of need to ensure their availability in a timely manner for this work.
- B. Delivery Schedules: Make as many trips to the job site as are necessary to deliver all materials of this section in a timely manner to ensure orderly progress of the total work.
- C. Compliance: Do not permit materials not complying with the provisions of this section of these specifications to be brought onto or to be stored at the job site; immediately remove from the job site all non-complying materials and replace them with materials meeting the requirements of this section.
- D. Inspection: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
  - 1. Verify that rough carpentry may be performed in strict accordance with the original design and all pertinent codes and regulations.
- E. Discrepancies: In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
- F. Workmanship: All rough carpentry shall produce joints true, tight, and well nailed with all members assembled in accordance with the drawings and with all pertinent codes and regulations.
- G. Selection of Lumber Pieces: Carefully select all members; select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing or making proper connections.
  - 1. Cut out and discard all defects which render a piece unable to serve its intended functions; lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
- H. Shimming: Do not shim sills, joists, short studs, trimmers, headers, lintels, or other framing components.
- I. Treated Lumber: Use only treated lumber for all wood blocks and nailing grounds, etc. (other than foundation grade redwood) in, or in contact with, concrete.
- J. Treatment: Treat all wood less than two feet above finished grade by spraying with the preservative specified in this section of these specifications, to a minimum distance of six inches from the ends, or otherwise treat as approved in advance by the Architect. Perform all treatment in strict accordance with published recommendations of the manufacturer of the treatment preservative.
- K. General Framing: In addition to all framing operations normal to the fabrication and erection indicated on the drawings, install all backing required for the work of other trades. Set all horizontal or sloped members with crown up. Do not notch, bore, or cut members for pipes ducts conduits, or other reasons except as shown on the drawings or as specifically approved in advance by the Architect.
- L. Bearing: Make all bearings full unless otherwise indicated on the drawings. Finish all bearing surfaces on which structural members are to rest so as to give sure and even support; where framing members slope, cut or notch the ends as required to give uniform bearing surface.
- M. Blocking: Install all blocking required to support all items of finish and to cut off all concealed draft openings, both vertical and horizontal, between ceiling and floor areas.
  - 1. All other locations where openings could afford passage for rodents or flames.
  - 2. Fire-block in the following specific locations:
    - a. In all stud walls at ceiling and floor levels.
    - b. In all stud walls, including furred spaces, so that the maximum dimension of each concealed space is not more than eight feet.

- c. All other locations where openings could afford passage for rodents or flames.
- N. Stud Walls and Partitions: Make all studs single length, unspliced, and platform framed.
- O. Corners and intersections: Unless otherwise indicated on the drawings, frame all corners and intersections with three or more studs and all required bearing for wall finish.
- P. Alignment: On all framing members to receive a finished wall or ceiling, align the finish subsurface to vary not more than 1/8 inch from the plane of surfaces of adjacent framing and furring members.
- Q. Nailing: Use only common wire nails or spikes except where otherwise specifically noted in the drawings.
  - 1. Provide penetration into the piece receiving the point of not less than 1/2 the length of the nail or spike provided, however, that 16 d nails may be used to connect two pieces of the two inch (nominal) thickness.
  - 2. Do all nailing without splitting wood, preboring as required; replace all split members.
- R. Bolting: Drill holes 1/16 inch larger in diameter than the bolts being used; drill straight and true from one side only. Bolt threads must not bear on wood; use washers under head and nut where both bear on wood; use washers under all nuts.
- S. Screws: For lag screws and wood screws, prebore holes same diameter as root of thread; enlarge holes to shank diameter for length of shank.
  - 1. Screw all lag screws and wood screws. Do NOT Drive screws.
- T. Installation of Building Paper: Install the specified building paper over all exterior framing members where indicated to be installed, lapping all joints to prevent penetration of water into the stud spaces, and securely fastening the paper in place in accordance with the manufacturer's published recommendations.
- U. Cleaning Up: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends, and debris.

**END OF SECTION**

## **SECTION 07115 - BITUMINOUS DAMPPROOFING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 SUMMARY**

- A. This Section includes cold-applied, emulsified-asphalt dampproofing applied to the following surfaces:
  - 1. Exterior face of inner wythe of exterior masonry cavity walls and concrete walls above top of foundation.
  - 2. Exterior, below-grade surfaces of concrete and masonry foundation walls.

#### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include recommendations for method of application, primer, number of coats, coverage or thickness, and protection course.
- B. Material Certificates: For each product, signed by manufacturers.

#### **1.4 QUALITY ASSURANCE**

- A. Source Limitations: Obtain primary dampproofing materials and primers through one source from a single manufacturer. Provide secondary materials recommended by manufacturer of primary materials.

#### **1.5 PROJECT CONDITIONS**

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt dampproofing to be performed according to manufacturers' written instructions.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Cold-Applied, Emulsified-Asphalt Dampproofing:
  - 2. Euclid Chemical Company (The)
  - 3. Gardner Asphalt Corporation
  - 4. Henry Corporation
  - 5. Koppers Industries, Inc.
  - 6. Malarkey Roofing Company
  - 7. Meadows, W. R., Inc.
  - 8. Sonneborn, Div. Of ChemRex, Inc.
  - 9. Tamms Industries

#### **2.2 BITUMINOUS DAMPPROOFING**

- A. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class I.

## **2.3 MISCELLANEOUS MATERIALS**

- A. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class I, except diluted with water as recommended by manufacturer.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, with Applicator present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.
  - 1. Begin dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Protection of Other Work: Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- B. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

### **3.3 APPLICATION, GENERAL**

- A. Comply with manufacturers written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.
- B. Apply additional coats if recommended by manufacturer or required to achieve coverage's indicated.
- C. Allow each coat of dampproofing to cure 24 hours before applying subsequent Coats.
- D. Apply dampproofing to top of footings and grade beams where applicable, whether indicated or not.
  - 1. Apply from finished-grade line to top of footing.
  - 2. Extend 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
  - 3. Install flashings and corner protection stripping at internal and external corners, changes in plan, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch (200 mm) wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat required for embedding fabric is in addition to other coats required.
- E. Apply dampproofing to provide continuous plane of protection on exterior face of inner wythe of exterior masonry cavity walls.
  - 1. Lap dampproofing at least ¼ inch (6 mm) onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.
  - 2. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe, and lap dampproofing at least ¼ inch (6 mm) onto shelf angles supporting veneer.

### **3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING**

- A. On Exterior Face of Inner Wythe of Cavity Walls: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft. (0.4 L/sq.m).

### **3.5 CLEANING**

- A. Remove dampproofing materials from surfaces not intended to receive dampproofing.

## **END OF SECTION**

## SECTION 07200 - INSULATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections shall apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. Extent of insulation work is shown on drawings and indicated by provisions of this section.
- B. Applications of insulation specified in this section include the following:
  - 1. Blanket-type at all exterior stud walls.
  - 2. Blanket type building above new ceiling or blown insulation in attic area - Contractors Option.
  - 3. Sound Attenuation at interior stud walls.
  - 4. Sound Attenuation above acoustical ceilings – at partition walls.
  - 5. Cavity Wall Insulation.
  - 6. Foam Insulation at CMU Cells
  - 7. Metal Building Roof and Wall Insulation
  - 8. Retrofit Metal Roofing Insulation

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications and installation instructions for each type of insulation and vapor barrier material required.

#### 1.4 PRODUCT HANDLING

- A. General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

### PART 2 - PRODUCTS

#### 2.1 BATT INSULATION

##### A. MANUFACTURERS:

- 1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
  - a. Certain-Teed Products Corp.; Valley Forge, PA
  - b. Manville Bldg. Materials Corp.; Denver, CO.
  - c. Owens-Corning Fiberglass Corp.; Toledo, OH.
- 2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

##### B. MATERIALS:

- 1. Mineral/Glass Fiber Blanket/Batt Insulation (M/GFB-Ins): Inorganic (nonasbestos) fibers formed into resilient flexible blankets or semi-rigid batts; FS HH-1-521. Manufacturer's standard lengths and widths as required to coordinate with spaces to be insulated.
- 2. Exterior Walls: Provide foil faced (FSK ASTM 84 – non-flammable) batts at all exterior walls that will have no interior wall covering applied.
  - a. Thickness: 3 ½" Batts will have a minimum R13

- b. Thickness: 6" Batts will have a minimum R19
- 3. Exterior Walls: Provide unfaced batts at all exterior wall applications that receive interior wall coverings (ie: sheetrock, plywood, etc.).
  - a. Thickness: 3 ½" Batts will have a minimum R13
  - b. Thickness: 6" Batts will have a minimum R19
- 4. Interior Stud Walls: Provide unfaced Sound Attenuation batts at interior stud partitions.
  - a. Thickness: 3 ½" (nominal), unfaced batts.
- 5. Above Ceilings: Provide unfaced batts at exposed wood framed roof areas between the trusses at the bottom cord or joists that will receive interior coverings at the bottom of the system (ie: sheetrock, plywood, concrete, etc.).
  - a. Thickness: R-Factor: 30 (minimum) as follows:
- 6. Above Ceilings Contractor Option: Provide Granulated Loose fill insulation conforming to Federal Spec. Hh-1-1030, Type I, Class B, in attic area above the air barrier. Labeling shall include the data above as well as the recommended installation density. Provide insulation baffles. This option MUST include insulation baffles as specified below.
  - a. Thickness: R-Factor: 30 (minimum) as follows:
  - b. Provide and install Insulation Baffles equal to Owens Corning Raft-R-Mate Attic Rafter Vents with Air Stop/Insulation Block. Extruded Polystyrene; Air Channel Depth, 1.5"; Net Free Air Flow, 22.3 sq.in.; Dimension to fit between rafters. Install per manufacturer's instructions.
- 7. Above New Acoustical Ceilings: Provide unfaced Sound Attenuation batts above all interior metal stud partition-divider walls as indicated on drawings.
  - a. Thickness: 3 ½" (nominal), Unfaced batts laid over acoustical ceiling.
  - b. Install 4'-0" out from each side of partition/divider wall.
  - c. Install entire length of partition/divider wall.

## 2.2 CAVITY WALL INSULATION - POLYSTYRENE

### A. MANUFACTURERS:

- 1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
  - a. Styrofoam SM/SB; Dow Chemical USA.
  - b. Foamular 250; UC Industries.
  - c. Certifoam, Minnesota Diversified Products, Inc.
- 2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

### B. MATERIALS:

- 1. Extruded Polystyrene Board Insulation: Rigid cellular polystyrene thermal insulation with closed cells and integral high density skin, formed by the exposition of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV; 5-year aged
- 2. All Cavity Walls: Provide rigid thermal insulation at the cavity space.
  - a. R-value of 5.0 Btu/ (hr x sf x degree F) at 75 degree F in manufacturer's standard lengths and widths
  - b. 1" thick, unless otherwise indicated.

## 2.3 METAL BUILDING ROOF AND WALL INSULATION – **SIMPLE SAVER SYSTEM**

### A. MANUFACTURERS:

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
  - a. Thermal Design, Inc., Simple Saver System, Madison, NE
2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

### B. References:

1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E 96 - Standard Test Method for Water Vapor Transmission of Materials in Sheet Form (Procedure B).
3. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
4. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
5. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
6. ASTM C 1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.

### C. Design Requirements:

1. Insulating system shall have a continuous vapor barrier inside of building purlins, girts, and insulation to provide complete isolation from inside conditioned air.

### D. MATERIALS:

1. Simple Saver System consists of Batt Insulation, Roof Insulation, Wall Insulation, Vapor Barrier Liner Fabric, Thermal Breaks, Straps, and other devices and components in a insulation system.
2. Batt Insulation: ASTM C 991 Type 1; preformed formaldehyde-free glass fiber batt conforming to the following:
  - a. Equal to purlin/girt spacing by manufacturer's standard lengths.
  - b. Unfaced.
3. Roof Insulation: Formaldehyde-free fiberglass batt or fiberglass blanket complying with ASTM C 991 Type 1 and ASTM E 84 with a thermal resistance and thickness as follows with Gym Guard:
  - a. Upper Layer: **R-11**; 3-1/2 inches (89 mm)
  - b. Bottom Layer: **R-19**; 6 inches (152 mm).
  - c. U Factor 0.035 (**R30**) installed.
  - d. Heated and Cooled Area: Total Installed Minimum R-25, U Factor 0.040.
  - e. Semi-Heated Area: Total Installed Minimum R-16, U Factor 0.060
4. Wall Insulation: Formaldehyde-free fiberglass blanket or batt complying with ASTM C 991 Type 1, ASTM E 136 and ASTM E 84 with a thermal resistance and thickness as follows:
  - a. **R-25**, U Factor U-0.040.
  - b. Heated & Cooled Area: Installed Minimum R-16.6, U Factor 0.062
  - c. Semi Heated Area: Installed Minimum R-13, U Factor 0.071

5. Vapor Barrier Liner Fabric: Syseal® type woven, reinforced, high-density polyethylene yarns coated on both sides with a continuous white or colored polyethylene coatings, as follows:
  - a. Product complies with ASTM C 1136, Types I through Type VI.
  - b. Perm rating: 0.02 for fabric and for seams in accordance with ASTM E 96.
  - c. Flame/Smoke Properties: 1) 25/50 in accordance with ASTM E 84. 2) Self-extinguishes with field test using matches or butane lighter.
  - d. Ultra violet radiation inhibitor to minimum UVMAX® rating of 8.
  - e. Size and seaming: Manufactured in large custom pieces by extrusion welding from roll goods and fabricated to substantially fit defined building area with minimum practicable job site sealing.
  - f. Provide with factory double, extrusion welded seams. Stapled seams or heat-melted seams are not acceptable due to degradation of fabric.
  - g. Factory-folded to allow for rapid installation.
  - h. Color: To be selected by Architect after bid date from manufactures standards.
6. Vapor Barrier Lap Sealant:
  - a. Solvent-based, Simple Saver polyethylene fabric adhesive.
7. Vapor Barrier Tape:
  - a. Double-sided sealant tape 3/4 inch (19 mm) wide by 1/32 inch (.79 mm) thick.
8. Vapor Barrier Patch Tape:
  - a. Single-sided, adhesive backed sealant tape 3 inches (76 mm) wide made from same material as Syseal® type liner fabric.
- 9. Thermal Breaks:**
  - a. Provide thermal blocks/breaks at all roof to purlin connections points.**
  - b. 1/8 inch (3 mm) thick by 3 inch (76 mm) wide white, closed-cell polyethylene**
  - c. foam with pre-applied adhesive film and peel-off backing.**
  - d. Polystyrene Snap-R snap-on thermal blocks.**
10. Straps:
  - a. 100 KSI minimum yield tempered, high-tensile-strength steel.
  - b. Size: Not less than 0.020 inch (0.50 mm) thick by 1 inch (25 mm) by continuous length.
  - c. Galvanized, primed, and painted to match specified finish color on the exposed side.
  - d. Color: As selected from manufactures standards
11. Primed and painted to match specified finish color on the exposed side.
12. High-tensile-strength stainless steel.
  - a. Woven polyester plastic. As selected from manufactures standards
13. Fasteners:
  - a. For light gage steel: #12 by 3/4 (19 mm) inch plated Tek 2 type screws with sealing washer, painted to match specified color.
  - b. For heavy gage steel: #12 by 1-1/2 inch (38 mm) plated Tek 4 type screws with sealing washer, painted to match specified color.
  - c. For wood, concrete, other materials: As recommended by manufacturer.
14. Wall Insulation Hangers:



- a. Fast-R preformed rigid hangers, 32 inch (813 mm) long galvanized steel strips with barbed arrows every 8 inches (203 mm) along its length.

E. INSTALLATION:

1. General:

- a. Install pre-engineered building insulation system in accordance with manufacturer's installation instructions and the approved shop drawings.
- b. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- c. Install in exterior spaces without gaps or voids. Do not compress insulation.
- d. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- e. Fit insulation tight in spaces and tight to exterior side of the sealed liner fabric and around mechanical and electrical services within plane of insulation.

2. Roof Insulation Installation:

a. Straps:

- i. Cut straps to length and install in the pattern and spacings indicated on shop drawings.
- ii. Tension straps to required value.

b. Vapor Barrier Fabric:

Install vapor barrier fabric in large one-piece custom fabricated pieces to substantially fit defined building areas with minimum practicable job site sealing.

- i. Position pre-folded fabric on the strap platform along one eave purlin.
- ii. Clamp the two bottom corners at the eave and also centered on the bay.
- iii. Pull the other end of the pleat-folded fabric across the building width on the strap platform, pausing only at the ridge to fasten the straps and fabric in position where plane of roof changes and to release temporary fasteners on the opposite ridge purlins.
- iv. Once positioned, install fasteners from the bottom side at each strap/purlins intersection.
- v. Trim edges and seal along the rafters.
- vi. All seams must be completely sealed and stapled seams not acceptable.

c. Insulation:

- i. Unpack, and shake to a thickness exceeding the specified thickness.
  - ii. Ensure that cavities are filled completely with insulation.
  - iii. Place on the vapor barrier liner fabric without voids or gaps.
  - iv. Place top layer of insulation over and perpendicular to the purlins without voids or gaps, as roof sheathing is applied.
  - v. Place thermal block on top of purlins or bottom of purlins for retrofit work if no other thermal break exists.
  - vi. Place new insulation between purlins at the required thickness for the R-value specified.
- d. Seal vapor barrier fabric to the wall fabric and elsewhere as required to provide a continuous vapor barrier.

3. Wall Insulation Installation:

- a. Install thermal break to exterior surface of girts as wall sheathing is applied.

- b. Install self-sticking foam thermal break to interior surface of girts prior to installation of insulation.
  - c. Position and secure Fast-R hangers to girts on the inside face of the wall sheathing.
  - d. Cut insulation to required lengths to fit vertically between girts.
  - e. Fluff the insulation to the full-specified thickness.
  - f. Neatly position in place and secure to Fast-R hangers.
  - g. Ensure that cavities are filled completely with insulation.
4. Vapor Barrier Fabric:
- a. Install vapor barrier fabric in large one-piece custom fabricated pieces to substantially fit defined building areas with minimum practicable job site sealing.
  - b. Apply the vapor barrier fabric by clamping it in position over eave strap and installing fasteners through the eave strap into each roof strap, permanently clamping the wall fabric between them.
  - c. Once in position, draw the vapor barrier fabric down over the column flanges to the base angle and install vertical straps along each column and 5 feet 0 inches on center, maximum, fastening to each girt to retain system permanently in place.
  - d. All seams must be completely sealed and stapled seams not acceptable.
5. Seal wall fabric to the roof fabric, to the base angle and up the columns to provide a continuous vapor barrier.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION AND PREPARATION**

- A. Installer must examine substrates and conditions under which insulation work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with insulation work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- B. Clean substrates of substances harmful to insulations or vapor barriers, including removal of projections which might puncture vapor barriers.
- C. Close off openings in cavities to receive poured-in-place and insulation, sufficiently to prevent escape of insulation. Provide bronze or stainless steel screen (inside) where openings must be maintained for drainage or ventilation.

### **3.2 INSTALLATION**

- A. General: Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.
- B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

### **3.3 CAVITY WALL INSULATION**

- A. On units of plastic insulation, install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
  - 1. Fill all cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

### **3.4 PROTECTION**

- A. General: Protect installed insulation and vapor barriers from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazards.

**END OF SECTION**

## SECTION 07410 - PREFORMED METAL ROOFING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. The work under this section consists of all preformed metal roofing, underlayment, ridge vent system, sheet metal, roof drainage accessories and all related items necessary to complete the roofing system work indicated on the drawings and herein specified including but not limited to the following:
  - 1. Formed Roof Panels for Standing Seam Installation
  - 2. Underlayment.
  - 3. Workmanship
  - 4. Inspection of Surfaces
  - 5. Protection
  - 6. Delivery, Samples and Shop Drawings

#### 1.3 QUALITY ASSURANCE

- A. The Contractor shall engage the services of a Professional Roof Consultant. The Consultant must hold a minimum title of Registered Roof Observer (RRO) through the International Institute of Building Enclosure Consultants (IIBEC) and provide evidence of adequate insurance as required below. The Consultant should perform three (3) inspections during the installation of each new roof system type (1 – Start up inspection; 2 – Interim inspection; 3 – Final inspection). The Consultant must document all site visits with photographs and written reports. All reports shall be forwarded to the Architect with documentation of the roofing progress and any deficiencies noted during the inspections. Upon completion of all punch list items, the Consultant should provide a letter of roof completion advising the new roof systems meet and/or exceed the project requirements. ***(Note: Although the contractor will be paying the roof consultant from their proceeds, the roof consultant will be considered an agent of the owner and architect throughout the project and will perform the required inspections on behalf of the owner and architect. The above specification shall be applied to individual facilities when multiple site locations are included in the project.)***
  - 1. Roof Consultant Insurance Requirements:
    - a. Gen. Liability - \$1,000,000 each occurrence - \$2,000,000 General Aggregate / Auto. Liability - \$1,000,000 / Umbrella Liability. - \$1,000,000 / Workers Compensation - \$1,000,000 per statute / Professional Liability - \$1,000,000
  - 2. Approved Roof Consulting Firm:
    - a. Roof Asset Management, Inc. | David Lee, RRO, CIT, FAA-107 | 4950 Woodfield Drive, Millbrook, Alabama 36054 | (334) 590-7999.
    - b. Substitutions: Roof consulting firms must be pre-approved by the Architect. Requests for a substituting firm must be submitted "In writing" 10 (Ten) days prior to the bid opening.
- B. Performance Test Standards: Provide preformed panel systems which have been pretested and certified by manufacturer to provide specified resistance to air and water infiltration and structural deflection and failure when installed as indicated and when tested in accordance with AAMA 501, "Methods of Test for Metal Curtain Walls".
- C. Field Measurements: Where possible, prior to fabrication of prefabricated panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units

where final dimensions cannot be established prior to fabrication.

- D. Impact Resistance: Roof coverings installed on low-slope roofs (roof slope <2:12) shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test "FM 4470.

#### 1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications, standard details, certified product test results, installation instructions and general recommendations, as applicable to materials and finishes for each component and for total system of preformed panels.
- B. Samples: Submit 2 samples 12" square, of each exposed finish material.
- C. Shop Drawings: Submit small-scale layouts of panels on roofs, and large-scale details of edge conditions, joints, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory and field assembly work.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store prefabricated components, sheets, panels and other manufactured items so they will not be damaged or deformed.
- B. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight ventilated covering. Store metal sheets or panels so that water accumulations will drain freely. Do not store sheets or panels in contact with other materials which might cause staining.

#### 1.6 ROOFER'S QUALIFICATIONS

- A. Installation of the metal roofing and roof related accessories shall be performed by **Certified / Preferred Roofers** authorized by the manufacturer as trained and qualified to erect the manufacturer's product.
- B. The Contractor shall submit a letter from the manufacturer of the metal roofing system, certifying the date of certification from the Manufacturer and the dates and year the Roofing Contractor attended school, prior to full certification that this Roofing Contractor is a certified roofer.

#### 1.7 ROOFING WARRANTIES & GUARANTEE

- A. Weather Tightness Warranty
  - 1. The entire installation (sub-framing, clips, panels, fasteners, rakes, eave, ridge, valley flashing conditions, roof to wall conditions as-well-as all materials specified as supplied by the manufacturer) shall be guaranteed weather tight for a minimum of **Twenty (20) years (NO Dollar Limit NDL)**. Provide written warranty, signed by metal roofing manufacturer and his authorized installer, agreeing to replace/repair defective materials and workmanship during the warranty period, certified by the third-party inspection firm as stated under QUALITY ASSURANCE. This warranty shall be identified as neither Non-Depreciating, Non-Pro-Rated, nor have exclusions that identify, valleys, curbs, and flashings. The warranty shall be signed by the Manufacture of the roofing materials and the authorized installer.
  - 2. Compatibility: Provide products which are recommended by manufacturers to be fully compatible with indicated substrates or provide separation materials as required to eliminate contact between incompatible materials.
- B. Manufacturer's Warranty
  - 1. **Manufacturer's roofing warranties which contain language regarding the governing of the warranty by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such warranties.**
  - 2. Roof Panels: Durability of the metallic coated and unpainted roof panels due to rupture, structural failure or perforation shall be warranted for a period of **Twenty (20) years** by the manufacturer.

3. Color Finish:
  - a. The exterior color finish for painted panels shall be warranted by the Manufacturer for **Twenty-five (25) years** against blistering, peeling, cracking, flaking, chalking and shipping.
  - b. Excessive color change and chalking shall be warranted for **Twenty-five (25) years**.
    - i. Color change shall not exceed 5 NBS units per ASTM D2244.68T, chalking shall not be less than a rating of 6 (white) or 8 (other colors) per ASTM D-659.
4. The roofing manufacture shall be required to provide documentation certifying that the roof design provided complies with the performance requirements as set forth in IBC Chapter 15, Section 1504. The documentation shall be attached to the roof warranty at the close out of the project.
- C. Contractor's Roofing Guarantee
  1. Contractor shall furnish Contractors 5 Year Alabama Division of Construction Management Roofing Guarantee. This roofing guarantee is included in the front end documentation of this project manual.
- D. All roof warranties/guarantees shall be provided to the Owner, by the Contractor at the Final Inspection to obtain the Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  1. American Buildings Company/A Nucor Company; (**Basis of Design and Quality**); [www.americanbuildings.com](http://www.americanbuildings.com); 1150 State Docks Road, Eufaula, Alabama 36027; Phone: 334.687.2032.
  2. Butler Manufacturing; [www.buttermfg.com](http://www.buttermfg.com); 1540 Genessee St., Kansas City, MO. 64102; Phone: 816.968.3000
  3. MBCI Manufacturing; [www.mbc.com](http://www.mbc.com); 2280 Monier Avenue, Lithia Springs, Georgia, 30122; Phone: 844.2506 or 770.729.4772.
  4. Varco Pruden; [www.vp.com](http://www.vp.com); 3200 Players Club Circle, Memphis, TN 38125; Phone: 1.901.748.8000
  5. Morin / A Kingspan Group Company; [www.kingspan.com/us/en-us/product-groups/metal-roof-wall-systems](http://www.kingspan.com/us/en-us/product-groups/metal-roof-wall-systems); 1975 Eidson Drive, Florida, 32724; Phone: 860.584.0900 or 800.640.9501
  6. ACI Building Systems, LLC.; [www.acibuildingsystems.com](http://www.acibuildingsystems.com); 10125 Highway 6 West, Batesville, MS 38606; Phone: 662.563.4574.
  7. AllSouth Pre-Engineered Components, LLC.; 985 Technology Drive, Dothan, Alabama, 36303; Phone: 334.699.8394; [www.buildwithape.com](http://www.buildwithape.com).
  8. Berridge Manufacturing Company; [www.berridge.com](http://www.berridge.com); 319 Lee Industrial Boulevard, Austell, Georgia; Ph: 770.941.5141.

### 2.2 MATERIALS

- A. All materials shall be from a single source.
- B. Sanding Seam II with Kynar 500 Finish by American Buildings Company/A Nucor Company.
  1. Standing seam roof panel shall have a configuration consisting of 2 inch high vertical rib spaced on 24 inch centers. The panel shall have flush horizontal and vertical surfaces to facilitate sealing at terminations. Panel configurations which create voids requiring supple metal closure devices shall not be considered acceptable. Panels shall be joined at the sidelap with an interlocking seam mechanically locked by a seaming machine after

installation. The female panel seam shall have a factory applied sealant, in compliance with UL90.

2. The panel shall be **24 gauge (minimum)** commercially pure aluminum coated steel meeting military specification MIL-C-4174A Type II, Galvalume or G90 galvanized. Minimum yield strength shall be 80,000 PSI.
3. Deviations in appearance from the quality standard manufacturer's panel must be approved by the owner before acceptance.
4. Changes in framing or variations in loading to the existing structure caused by alternate roof systems shall be subject to review and all costs for any modifications shall be the responsibility of the General Contractor.
5. System Description: The roof system is a concealed fastener interlocking standing seam system. ***Panel must not be roll formed on site, nor use a portable roll former whereby the contractor manufactures the panel versus a single sourced manufacture providing the finished materials with a single sourced warranty.***
6. Roof panels shall be standing seam interlocking design and secured to the supports with a concealed structural fastening system. UL certification must appear on the panel if so requested.
7. The concealed attachment system shall eliminate all through penetration of the exposed roofing surface into structural supports and allow the roof covering to move independently of any differential thermal movement by the framing system.
8. The panel to structural clip shall be designed to provide +/- one inch of thermal movement. It shall incorporate a self centered feature to assure one inch of movement in both directions.
9. The standing seam shall have integral male and female interlocking ribs with a factory applied, non-hardening sealant, and the seams shall be continuously locked or crimped together by mechanical means during installation.
10. Roof panels shall be fastened to the support framing members with a concealed clip or backing device of steel having a protective metallic coating. Through penetration of the roofing surface by exposed fasteners shall occur only for non-structural connection at panel termination and roof perimeter flashing location.
11. Panel termination and perimeter flashing (attached to roof panels) shall be sealed with sealants recommended by the manufacturer.
12. Required closures shall be metal. Non-metal closures shall not be acceptable.
13. Provide thermal blocks at all roof to purlin connection points/deck supports.

## 2.3 METAL FINISHES

- A. General: Apply coating either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Protect coating promptly after application and cure, by application of strippable film or removable adhesive cover and retain until installation has been completed.
- B. Color Finish on Roof Panels and Trim:
  1. Panels shall have a factory color finish on the exposed side. The exposed finish shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning.
  2. Color of the exterior roof panels and trim shall be selected from manufactures standard color pallet.
  3. The exterior color finish shall meet or exceed the performance requirements specified below.
    - a. Paint Color Test:

- i. Test: Film Thickness; Test Method: ASTM D-1005; Performance: 0.2 mil primer 0.8-0.9 mil topcoat
- ii. Test: 60° @ under 10 low gloss; Test Method: ASTM D-523; Performance: 25-35
- iii. Test: IR Reflectivity; Test Method: ASTM D-4803-97; Performance: Must meet 25% Minimum (exceeds)
- iv. Test: Pencil Hardness; Test Method: ASTM D-3363; Performance: HB-H
- v. Test: Flexibility, T-Bend; Test Method: ASTM D-4145; Performance: 2-T Galvalume Steel
- vi. Test: Adhesion; Test Method: ASTM D-3359; Performance: No adhesion Loss
- vii. Test: Reverse Impact; Test Method: ASTM D-2794; Performance: No cracking or loss of adhesion
- viii. Test: Abrasion, Falling Sand; Test Method: ASTM D-968; Performance: 65-85 1/mil
- ix. Test: Mortar Resistance; Test Method: ASTM C-267; Performance: No effect
- x. Test: Detergent Resistance; Test Method: ASTM D-2248 3% 72 hrs. @ 100°F; Performance: No effect
- xi. Test: Acid Pollutants; Test Method: ASTM D-1308 10% Muriatic Acid (15 min) 20% Muriatic Acid (15 min); Performance: No effect, AAMA 605.2 <5 units color change
- xii. Test: Acid Rain Test; Test Method: Kesternich; Performance: 15 cycles minimum, no objectionable color change
- xiii. Test: Alkali Resistance; Test Method: 20% Sodium Hydroxide (1hr); Performance: No effect
- xiv. Test: Salt Spray Resistance 5% @ 95° F; Test Method: ASTM B-117; Performance: 1000 hrs Galvalume steel
- xv. Test: Humidity Resistance 100% @ 100° F; Test Method: ASTM D-2247; Performance: Passes 1000 hrs Galvalume Steel
- xvi. Test: South Florida exposure; Test Method: ASTM D-2244; Performance: <5 units color change
- xvii. Test: UVB (313 bulbs); Test Method: ASTM G-53; Performance: Passes 3000 hrs
- xviii. Test: Chalk Resistance; Test Method: ASTM D-4214; Performance: Rating of 8 min

4. Colors must meet the following: The solar reflectance for a steep-sloped roof must be a minimum of 25%, dropping no less than to 15% after three years. Low sloped roofs (below 2:12) must be a minimum of 65% dropping to no less than 50% after three years.

## 2.4 ROOF PANELS

- A. General: Provide roofing sheets formed to the general profile or configuration indicated. All roof panels shall be full length, no end laps allowed.
- B. Zinc-Coated Steel Sheets: Provide structural quality hot-dip galvanized steel sheets, complying with requirements of ASTM A446, Grade C, with G90 coating complying with ASTM A525.
- C. Aluminum Coated Steel Sheets: Provide drawing quality aluminum coated steel sheets, complying with requirements of ASTM A463, with T1-40 coating.
  - 1. Metal thickness not less than 24 ga. (0.0179").
- D. Accessories: Provide the following sheet metal accessories factory formed of the same material and finish as the roofing and siding.



1. Flashings.
2. Fillers.
3. Metal expansion joints.
4. Facias
5. Ridge covers.
6. Cover exposed structural and secondary members at exterior.

E. Fasteners:

1. Provide self-tapping screws, bolts, nuts, self-locking rivets, self-locking bolts, end welded studs, and other suitable fasteners as standard with the manufacturer designed to withstand design loads.
2. Provide metal-backed neoprene washers under heads of fasteners bearing on weather side of panels.
3. Use stainless steel fasteners for exterior application and galvanized or cadmium plated fasteners for interior applications.
4. Locate and space fastenings in true vertical and horizontal alignment. Use proper type fastening tools to obtain controlled uniform compression for positive seal without rupture of neoprene washer.
5. Provide fasteners with heads matching color of roofing sheets by means of plastic caps or factory-applied coating.

F. Flexible Closure Strips: Provide closed-cell, expanded cellular rubber, self-extinguishing flexible closure strips. Cut or premold closure strips to match corrugation configuration of roofing and siding sheets. Provide closure strips where indicated or necessary to ensure weathertight construction.

G. Sealing Tape: Provide pressure sensitive 100 percent solids isobutylene tripolymer compound sealing tape with release paper backing. Provide permanently elastic, non-sag, non-toxic, non-staining tape not less than 1/2" wide and 1/8" thick.

H. Joint Sealants: Provide one-part elastomeric polyurethane polysulfide or silicone rubber sealant as recommended by the building manufacturer.

## **2.6 MISCELLANEOUS MATERIALS**

A. Internal Panel Framing: Manufacturer's standard.

B. Fasteners: Manufacturer's standard noncorrosive types, with exterior heads gasketed.

C. Accessories: Except as indicated as work of another specification section, provide components required for a complete roofing/siding system, including:

1. Trim
2. Copings
3. Fascias
4. Gravel stops
5. Mullions
6. Sills
7. Corner Units
8. Ridge Closures
9. Clips
10. Seam Covers
11. Battens

- 12. Flashings
- 13. Gutters
- 14. Downspouts
- 15. Louvers
- 16. Sealants
- 17. Gaskets
- 18. Fillers
- 19. Closure Strips
- 20. All similar items.

21. Match materials/finishes of preformed panels.

- D. Bituminous Coating: Cold-applied asphalt mastic, SSPC paint 12, compounded for 15 mil dry film thickness per coat.

## **2.7 SHEET METAL ACCESSORIES**

- A. General: Provide coated steel sheet metal accessories with coated steel roofing and siding panels.
- B. Gauges of Materials:
  - 1. Roof Panels - 24 ga.
  - 2. Rake Flashing - 26 ga.
  - 3. Gutters-26 ga. (non-corrugated)
  - 4. Fascia/Eave Trim – 26 ga.
- C. Roof Jacks: Openings 8" in diameter or smaller may be flashed and sealed to the roof panel by jacks. Material shall be an EPDM material with an aluminum sealing ring base. Jacks are acceptable providing attachment in flat of panel and no standing seam rib has been altered. If rib must be cut, a curb must be used. Installation of roof jacks must comply with manufacturer's instructions.

## **PART 3 - EXECUTION**

### **3.1 PRE-ROOFING CONFERENCE**

- A. A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect and attended by representatives of the Owner, Division of Construction Management Inspector, General Contractor, Roofing Contractor, Sheet Metal Contractor, Roof Deck Manufacturer (if applicable), and the Roofing Materials Manufacturer (if warranty is required of this manufacturer). If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting. Provide at least 72 hours advance notice to participants prior to convening pre-roofing conference.
- B. The pre-roofing conference is intended to clarify demolition and application requirements for work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details, and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer's requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.

- C. The following are to be accomplished during the conference:
1. To review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
  2. To establish trade-related job schedules, including the installation of roof-mounted mechanical equipment.
  3. To establish roofing schedule and work methods that will prevent roof damage.
  4. Require that all roof penetrations and walls be in place prior to installing the roof.
  5. To establish those areas on the job site that will be designated as work and storage areas for roofing operations.
  6. To establish weather and working temperature conditions to which all parties must agree.
  7. To establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.
- D. The Architect shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project record and copies furnished the General Contractor, the Owner, the Division of Construction Management, and the Division of Construction Management Inspector.

### **3.2 INSTALLATION**

- A. General: Comply with panel fabricator's and material manufacturer's instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal/structural movement.
1. Install panels with concealed fasteners.
- B. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4" in 20'-0" on level/plumb/slope and location/line as indicated, and within 1/8" offset of adjoining faces and of alignment of matching profiles.
- C. Joint Sealers: Install gaskets, joint fillers and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer.
- D. Refer to other sections of these specifications for product and installation requirements applicable to indicated joint sealers.
- E. Water shall be prevented from entering the building during the work. This shall involve keeping penetrations sealed, planning the work to reroof sections and sealing new to old or other precautionary and effective safeguards.

### **3.3 ROOFING**

- A. General: Arrange and nest sidelap joints so that prevailing winds blow over, not into, lapped joints. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line. Protect factory finishes from damage.
1. Provide weatherseal under ridge cap. Flash and seal roof panels at eave and rake with rubber, neoprene or other closures to exclude weather.
- B. Standing Seam Roof Panel System: Fasten roof panels to hat channels with concealed clip in accordance with the manufacturer's instructions.
1. Install clips at each support using self-drilling fasteners.
  2. At end laps of panels install two strips of tape caulk between panels.
  3. Install factory-caulked cleats at standing seam joints. Machine seam cleats to the panels to provide a weather-tight joint.

- C. Sheet Metal Accessories: Install gutters, downspouts, ventilators, louvers, and other sheet metal accessories in accordance with manufacturer's recommendations for positive anchorage to building and weathertight mounting. Adjust operating mechanism for precise operation.

### **3.4 CLEANING AND PROTECTION**

- A. Damaged Units: Replace panels and other components of the work which have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.
- B. Cleaning: Remove temporary protective coverings and strippable films (if any) as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer and maintain in a clean condition during construction.

**END OF SECTION**

## SECTION 07411 - METAL WALL PANELS AND SOFFIT PANELS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. Extent of each type of preformed wall panels/siding is indicated on the drawings and by provisions of this section. Preformed wall panels/siding is hereby defined to include panels which are structurally capable of spanning between supports spaced as indicated.
- B. Types of materials required include the following:
  - 1. Exterior and Interior Wall Panel
  - 2. Metal Soffit Panel
  - 3. Workmanship
  - 4. Inspection of Surfaces
  - 5. Protection
  - 6. Delivery, Samples and Shop Drawings

#### 1.3 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA): [www.aamanet.org](http://www.aamanet.org):
  - 1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
  - 2. AAMA 809.2 Voluntary Specification Non-Drying Sealants.
- B. American Society of Civil Engineers (ASCE): [www.asce.org/codes-standards](http://www.asce.org/codes-standards):
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): [www.astm.org](http://www.astm.org):
  - 1. ASTM A755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
  - 2. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
  - 3. ASTM C920 - Specification for Elastomeric Joint Sealants.
  - 4. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
  - 5. ASTM D4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
  - 6. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
  - 7. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
  - 8. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

#### 1.4 QUALITY ASSURANCE

- A. Performance Test Standards: Provide preformed panel systems which have been pretested and certified by manufacturer to provide specified resistance to air and water infiltration and structural

deflection and failure when installed as indicated and when tested in accordance with AAMA 501, "Methods of Test for Metal Curtain Walls".

- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum of five years of experience in manufacture of similar products in successful use in similar applications.
- C. Field Measurements: Where possible, prior to fabrication of prefabricated panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units where final dimensions cannot be established prior to fabrication.

## 1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications, standard details, certified product test results, installation instructions and general recommendations, as applicable to materials and finishes for each component and for total system of preformed panels.
- B. Samples: Submit 2 samples 12" square, of each exposed finish material.
- C. Shop Drawings: Submit small-scale layouts of panels, and large-scale details of edge conditions, joints, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory and field assembly work.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer: The following manufacturers' products have been used to establish minimum standard for materials, workmanship and function:
  - 1. American Buildings Company/A Nucor Company; (Basis of Design and Quality); [www.americanbuildings.com](http://www.americanbuildings.com); 1150 State Docks Road, Eufaula, Alabama 36027; Phone: 334.687.2032.
  - 2. MBCI Manufacturing; [www.mbc.com](http://www.mbc.com); 2280 Monier Avenue, Lithia Springs, Georgia, 30122; Phone: 844.2506 or 770.729.4772.
  - 3. Morin / A Kingspan Group Company; [www.kingspan.com/us/en-us/product-groups/metal-roof-wall-systems](http://www.kingspan.com/us/en-us/product-groups/metal-roof-wall-systems); 1975 Eidson Drive, Florida, 32724; Phone: 860.584.0900 or 800.640.9501
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

### 2.2 MATERIALS

#### A. EXTERIOR PANELS AND INTERIOR PANELS:

- 1. "Archtectural" Panel by American Buildings Company/A Nucor Company. Vertical installation onlySemi-Concealed Head Fasteners.
  - a. The panel shall have major ribs 1 ¼" high. Spaces 12" on center for an even shadowed appearance. The panels are to be reinforced between the ribs for added strength. Each panel shall provide 36" net coverage in width.
  - b. Panels shall conform to one of the following:
    - I. Panel material as specified shall be 26 gage zinc-coated(galvanized) steel, coating designation G90, conforming to the requirements of ASTM A 653, Grade 80. Minimum yield strength shall be 80,000 psi.
  - c. Fasteners for Wall Panels:
    - I. Shall be manufacturer's fastener with hex washer head, cadmium or zinc plated.
    - II. Shall be assembled with an EPDM washer.
    - III. The fasteners shall be color coordinated with a premium coating system which protects against corrosion and weathering.
  - d. Finish/Color:

- I. Finish shall be Smartkote Kynar 500® finish.
- II. Provide all trims, fasteners, sealants to match selected colors.
- III. Color of the panels shall be selected by the Architect after bid date from manufactures Standard Color pallet.

## 2.3 SOFFIT PANELS

- 1. Liner Panel (SLP) by American Buildings Company/A Nucor Company.
  - a. The panel shall have a configuration consisting of 1" interlocking ribs. The interlocking ribs are designed to conceal the panel fasteners. The panel shall provide a net coverage of 12" in width. Panel shall be smooth finish.
  - b. Panel shall conform to the following:
    - I. Panel material as specified shall be 24 gage 50,000 psi
      - a) G90 Zinc-coated (galvanized)
  - c. Fasteners for Liner Wall Panels (SLP):
    - I. Shall be manufacturer's fastener with hex washer head, cadmium or zinc plated.
    - II. Shall be assembled with an EPDM washer.
    - III. The fasteners shall be color coordinated with a premium coating system which protects against corrosion and weathering.
  - d. Finish/Color:
    - I. Finish shall be Smartkote Kynar 500® finish.
    - II. Provide all trims, fasteners, sealants to match selected colors.
    - III. Color of the panels shall be selected by the Architect after bid date from manufactures Standard Color pallet.

## 2.4 METAL FINISHES

- A. General: Apply coating either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability.
- B. Protect coating promptly after application and cure, by application of strippable film or removable adhesive cover, and retain until installation has been completed.
- C. Durability: Provide coating which has been field tested under normal range of weathering conditions for minimum of 20 years without significant peel, blister, flake, chip, crack or check in finish, and without chalking in excess of 8 (ASTM D 659), and without fading in excess of 5 NBS units.
- D. Color Finish on All Trim and All Wall Panels: Panels shall have a factory color finish on the exposed side. The exposed finish shall consist of a 70% KYNAR 500 resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than 0.8 mil. exclusive of the primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. The color finish shall meet or exceed the performance requirements specified below. Color selected from manufactures standard colors.
- E. Paint Color Test:
  - 1. Test: Film Thickness; Test Method: ASTM D-1005; Performance: 0.2 mil primer 0.8-0.9 mil topcoat

2. Test: 60° @ under 10 low gloss; Test Method: ASTM D-523; Performance: 25-35
  3. Test: IR Reflectivity; Test Method: ASTM D-4803-97; Performance: Must meet 25% Minimum (exceeds)
  4. Test: Pencil Hardness; Test Method: ASTM D-3363; Performance: HB-H
  5. Test: Flexibility, T-Bend; Test Method: ASTM D-4145; Performance: 2-T Galvalume Steel
  6. Test: Adhesion; Test Method: ASTM D-3359; Performance: No adhesion Loss
  7. Test: Reverse Impact; Test Method: ASTM D-2794; Performance: No cracking or loss of adhesion
  8. Test: Abrasion, Falling Sand; Test Method: ASTM D-968; Performance: 65-85 1/mil
  9. Test: Mortar Resistance; Test Method: ASTM C-267; Performance: No effect
  10. Test: Detergent Resistance; Test Method: ASTM D-2248 3% 72 hrs. @ 100°F; Performance: No effect
  11. Test: Acid Pollutants; Test Method: ASTM D-1308 10% Muriatic Acid (15 min) 20% Muriatic Acid (15 min); Performance: No effect, AAMA 605.2 <5units color change
  12. Test: Acid Rain Test; Test Method: Kesternich; Performance: 15 cycles minimum, no objectionable color change
  13. Test: Alkali Resistance; Test Method: 20% Sodium Hydroxide (1hr); Performance: No effect
  14. Test: Salt Spray Resistance 5% @ 95° F; Test Method: ASTM B-117; Performance: 1000 hrs Galvalume steel
  15. Test: Humidity Resistance 100% @ 100° F; Test Method: ASTM D-2247; Performance: Passes 1000 hrs Galvalume Steel
  16. Test: South Florida exposure; Test Method: ASTM D-2244; Performance: <5 units color change
  17. Test: UVB (313 bulbs); Test Method: ASTM G-53; Performance: Passes 3000 hrs
  18. Test: Chalk Resistance; Test Method: ASTM D-4214; Performance: Rating of 8 min
- F. Internal Panel Framing: Manufacturer's standard.
- G. Fasteners: Manufacturer's standard noncorrosive types, with exterior heads gasketed.
- H. Accessories: Except as indicated as work of another specification section, provide components required for a complete wall panel/siding system, including trim, closures, fascias, gravel stops, mullions, sills, corner units, ridge closures, clips, seam covers, battens, flashings, gutters, louvers, sealants, gaskets, fillers, closure strips and similar items. Match materials/finishes of preformed panels.
- I. Bituminous Coating: Cold-applied asphalt mastic, SSPC paint 12, compounded for 15 mil dry film thickness per coat.

## **2.5 WALL PANEL FABRICATION**

- A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, and as required to fulfill indicated performance requirements which have been demonstrated by factory testing. Comply with indicated profiles and dimensional requirements, and with structural requirements.
- B. Metal Gages: Thicknesses required for structural performances, but not less than manufacturer's recommended minimums for profiles and applications indicated, and not less than 22 gauge.
- C. Required Performances: Fabricate panels and other components of wall system for the following installed performances.



- D. Water Penetration: No significant, uncontrolled leakage at 4 lbs. per sq. ft. pressure with spray test.
- E. Air Infiltration: 0.02 cfm per sq. ft. for gross roof/wall areas, with 4 lbs. per sq. ft. differential pressure.
- F. Sound Transmission: STC rating of 28.
- G. Sound Absorption, Interior Surfaces: Coefficient of 0.75.
- H. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials which are noncompatible or could result in corrosion or deterioration of either material or finishes.
- I. Fabricate panel joints with captive gaskets or separator strips, which provide a tight seal and prevent metal-to-metal contact in a manner which will minimize noise from movements within panel system.
- J. Condensation: Fabricate panels for control of condensation, including vapor inclusion of seals and provisions for breathing, venting, weeping and draining.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. General: Comply with panel fabricator's and material manufacturer's instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal/structural movement.
- B. Install panels with concealed fasteners.
- C. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4" in 20'-0" on level/plumb/slope and location/line as indicated, and within 1/8" offset of adjoining faces and of alignment of matching profiles.
- D. Joint Sealers: Install gaskets, joint fillers and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer.
- E. Refer to other sections of these specifications for product and installation requirements applicable to indicated joint sealers.
- F. Joint Sealers: Refer to other sections of these specifications for post-installation requirements on joint sealers; not work of this section.

#### **3.2 CLEANING AND PROTECTION**

- A. Damaged Units: Replace panels and other components of the work which have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.
- B. Cleaning: Remove temporary protective coverings and strippable films (if any) as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

### **END OF SECTION**

## **SECTION 07600 - FLASHING AND SHEET METAL**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Extent of each type of flashing and sheet metal work is indicated on drawings and by provisions of this section.
- B. Types of work specified in this section include the following:
  - 1. Metal Counter Flashing and Base Flashing.
  - 2. Metal Diverters. Verify location with Architect for all entry doors.
  - 3. Exposed Metal Trim Units
  - 4. Eave Strip/Drip Edge
  - 5. Fascia
  - 6. Soffit
  - 7. Coping
  - 8. Scuppers and Leader Heads
  - 9. Gutters
  - 10. Downspouts
  - 11. Elastic flashing.
  - 12. Elastic roof/wall expansion joint systems.
- C. Integral masonry flashings are specified as masonry work in sections of Division 4.

#### **1.3 REFERENCE STANDARDS**

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.
- B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- E. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007, with Editorial Revision (2012).
- F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007, with Editorial Revision (2012).
- G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

#### **1.4 SUBMITTALS**

- A. Product Data; Flashing, Sheet Metal, Accessories: Submit manufacturer's product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

#### **1.5 JOB CONDITIONS**

- A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of

materials and finishes.

## **PART 2 - PRODUCTS**

### **2.1 SHEET METALS**

- A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.
- B. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
  - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

### **2.2 GUTTERS**

- A. Gutters: Provide flat shapes, no rolled formed stiffeners or ribbed allowed. Form gutters in "continuous" sections not less than 8 feet in length, complete with end pieces, outlet tubes and other special pieces as may be required. Join sections with riveted and soldered or sealed joints. Provide expansion-type slip joint at center of runs.
  - 1. Furnish gutter supports spaced at 36" on center constructed of same metal as gutters.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.
- C. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
  - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

### **2.3 DOWNSPOUTS**

- A. Downspouts: Form downspouts in sections approximately 10 feet long (**no corrugated sections**), complete with elbows and offsets. Join sections with not less than 1-1/2" telescoping joints. Provide fasteners, designed to securely hold downspouts not less than 1" away from walls; locate fasteners at top and bottom and equally spaced at approximately 5 feet on center in between.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.
- C. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
  - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

### **2.4 METAL SOFFIT SYSTEM – METAL BUILDINGS**

- A. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. Soffit Liner Panel (SLP) by American Buildings Company/A Nucor Company. (Basis of Design).

2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. Materials: The panel shall have a configuration consisting of 1" interlocking ribs. The interlocking ribs are designed to conceal the panel fasteners. The panel shall provide a net coverage of 12" in width. Panel shall be smooth finish.
  1. Panel material as specified shall be 24 gage 50,000 psi.
    - a. G90 Zinc-coated (galvanized)
    - OR**
    - b. AZ50 aluminum-zinc alloy-coated steel
- C. Fasteners for Soffit Liner Wall Panels (SLP):

Shall be manufacturer's fastener with hex washer head, cadmium or zinc plated.

  1. Shall be assembled with an EPDM washer.
  2. The fasteners shall be color coordinated with a premium coating system which protects against corrosion and weathering.
- D. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
  - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

## **2.5 SOFFIT VENTS**

- A. At wood soffits, provide and install aluminum screened under-eave vents.
- B. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  1. Air Vent Inc.
  2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- C. Materials:
  1. Size: 6" x 16" with screen
  2. Net Free Area: 42" per vent
  3. Finish: Aluminum mill finish to be painted same color of soffit
  4. Quantity: Vents to be spaced equally apart.

## **2.6 SHEET FLASHING**

- A. Provide EPDM synthetic rubber sheet except where metal is indicated.
- B. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  1. Nervastral Seal Pruf HD-20
  2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- C. Materials:

1. Elastic Sheet Flashing/Membrane: Manufacturer's standard flexible, elastic, black, nonreinforced, flashing sheet of 50 - 65 mils thickness.

## **2.7 MISCELLANEOUS MATERIALS & ACCESSORIES**

- A. Solder:
  1. For use with steel or copper, provide 50 - 50 tin/lead solder (ASTM B 32), with rosin flux.
  2. For use with stainless steel: Provide 60 - 40 tin/lead solder (ASTM B 32), with acid-chloride type flux, except use rosin flux over tinned surfaces.
- B. Fasteners: Same metal as flashing/sheet metal or, other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
- C. Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
- D. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, non-drying, nonmigrating sealant.
- E. Epoxy Seam Sealer: 2-part noncrossive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.
- F. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/ weather-resistant seaming and adhesive application of flashing sheet.
- G. Paper Slip Sheet: 5-lb. rosin-sized building paper.
- H. Polyethylene Underlayment: 6-mil carbonated polyethylene film; FS L-P-512.
- I. Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, noncrossive.
- J. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncrossive, size and gage required for performance.
- K. Roofing Cement: Must be compatible with materials with which it comes in contact.
- L. Provide precast concrete splashblock sloped away from building, approximately 12-inches wide x 24-inches long x 2-inches thick x 3-inches high, with 3-raised edges and one "open" end turned toward building – at locations where downspouts would otherwise drain on grade or paving.
  1. Provide 1-preformed metal pan with corrugated bottom and properly hemmed edges (minimum 12" x 24") at each downspout which drains onto a roof below.

## **2.9 FABRICATED UNITS**

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
- B. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.
- C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 2" deep, filled with mastic sealant (concealed within joints).
- D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

- E. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION REQUIREMENTS**

- A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual".
  - 1. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.
- B. Underlayment: Where aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.
- C. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
- D. Install reglets to receive counter-flashing in manner and by methods indicated. Where shown in concrete, furnish reglets to trades of concrete work for installation as work of Division-3 sections. Where shown in masonry, furnish reglets to trades of masonry work, for installation as work of Division-4 sections.
  - 1. Install counter-flashing in reglets, either by snap-in seal arrangement, or by wedging in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.

#### **3.2 CLEANING AND PROTECTION**

- A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.
- B. Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

### **END OF SECTION**

## **SECTION 07900 - JOINT SEALERS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. The extent of each form and type of joint sealer is indicated on drawings and by provisions of this section.
- B. The applications for joint sealers as work of this section include the following:
  - 1. Joints (Interior).
  - 2. Joints (Exterior).
  - 3. Flashing Joints.
  - 4. Interior wall/ceiling joints.
- C. General Performance: Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's product specifications, handling/installation/curing instructions, and performance tested data sheets for each elastomeric product required.

#### **1.4 JOB CONDITIONS**

- A. Weather Conditions: Do not proceed with installation of liquid sealants under unfavorable weather conditions. Install elastomeric sealants when temperature by manufacturer for installation.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. General: Manufacturers listed in this article include those known to produce the indicated category of prime joint sealant material, either as a nominally pure generic product or as an equivalent-performance modification thereof or proprietary product.
- B. Manufacturers: The following manufacturer's products have been used to establish minimum standards for materials, workmanship and function:
  - 1. Acrylic Emulsion Latex Sealants:
    - a. Bostik.
    - b. Pecora Corp.
    - c. Sonneborn Building Products.
    - d. Tremco, Inc.
  - 2. Polyurethane Sealants:
    - a. Bostik.
    - b. Master Builders.
    - c. Pecora Corp.
    - d. Sonneborn Building Products.
    - e. Tremco, Inc.

3. Butyl Sealants:
  - a. Bostik.
  - b. TEC Incorporated.
  - c. Tremco, Inc.
4. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

## **2.2 MATERIALS**

- A. NOTE: The use of silicone sealants shall not be used at any exterior conditions.
- B. General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component. (Silicone sealant shall not be used at exterior conditions).
  1. Color: Standard colors matching finished surfaces.
  2. Applications: Use for:
    - a. Control, expansion, and soft joints in masonry, stone or concrete.
    - b. Joints between concrete and other materials.
    - c. Joints between metal frames and other materials.
    - d. Other exterior joints for which no other sealant is indicated.
- C. Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
  1. Applications: Use for:
    - a. Concealed sealant bead in sheet metal work.
- D. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, single component, paintable.
  1. Color: Standard colors matching finished surfaces.
  2. Applications: Use for:
    - a. Interior wall and ceiling control joints.
    - b. Joints between door and window frames and wall surfaces.
    - c. Other interior joints for which no other type of sealant is indicated.
- E. Acoustical Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, nonskinning.
  1. Applications: Use for concealed locations only:
    - a. Sealant bead between top stud runner and structure and between bottom stud track and floor or wall.
- F. Paving Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Class 25, Uses T, M and A; single component.
  1. Color: Standard color matching finished surfaces.
  2. Applications: Use for:
    - a. Joints in sidewalks and paving, either vehicular or pedestrian.
    - b. Isolation joints and control joints in slabs on grade.
- G. Bituminous and Fiber Joint Filler (BtmF-JF) provide resilient and non-extruding type premolded bituminous-impregnated fiberboard units complying with ASTM D 1751; FS HH-F-341, Type I; or AASHTO M213.



H. Miscellaneous Materials:

1. Joint Primer/Sealer: Provide type of joint primer/sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.
2. Bond Breaker Tape (BB-Tp): Provide polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.
3. Sealant Backer Rod (S-BR): provide compressible rod stock of polyethylene foam, polyurethane foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other recommended by sealant manufacturer for back-up of and compatibility with sealant. Where used with hot-applied sealant, provide heat-resistant type which will not be deteriorated by sealant application temperature as indicated.
  - a. Rod Size to Joint Width: Size of all backer rod width shall be 2 times the width of joint/gap to be sealed.

### **PART 3 - EXECUTION**

#### **3.1 INSPECTION**

- A. Installer must examine substrate, (joint surfaces) and conditions under which joint sealer work is to be performed and must notify Prime Contractor of unsatisfactory conditions.

#### **3.2 JOINT PREPARATION**

- A. Clean joint surfaces immediately before installation of gaskets, sealants or caulking compounds. Remove dirt, insecure coatings, moisture and other substrate which could interfere with seal of gasket or bond of sealant or caulking compound. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer.
- B. Prime or seal joint surfaces where indicated, and where recommended by sealant manufacturer. Confine primer/sealer to areas of sealant bond; do not allow spillage or migration onto adjoining surfaces.

#### **3.3 INSTALLATION**

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown on specified, and except where manufacturer's technical representative directs otherwise.
- B. Set joint filler units at depth or position in joint as indicated to coordinate with other work, including installation of bond breakers, backer rods and sealant. Do not leave voids or gaps between ends of joint filler units.
- C. Install sealant backer rod for liquid-applied sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated.
- D. Install bond breaker tape where indicated and where required by manufacturer's recommendations to ensure that liquid-applied sealants will perform as intended.
- E. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
- F. Install sealant to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of beads;
- G. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
- H. Spillage: Do not allow sealants or compounds to overflow from confines of joints, or to spill onto adjoining work, or to migrate into voids of exposed finishes. Clean adjoining surfaces by whatever

means may be necessary to eliminate evidence of spillage.

- I. Recess exposed edges of gaskets and exposed joint fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.
- J. Bond ends of gaskets together with adhesive of "weld" by other means as recommended by manufacturer to ensure continuous watertight and airtight performance. Miter-cut and bond ends at corners unless molded corner units are provided.

### **3.4 CURE AND PROTECTION**

- A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Advise Prime Contractor of procedures required for cure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion. Cure and protect sealants in manner which will minimize increases in modulus of elasticity and other accelerated aging effects. Replace or restore sealants which are damaged or deteriorated during construction period.

**END OF SECTION**

## **SECTION 08001 –ALUMINUM STOREFRONT (IMPACT AND WIND RESISTANT SYSTEMS)**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Extent of exterior aluminum storefronts is indicated on drawings and schedules.
- B. Types of exterior aluminum storefronts required include the following:
  - 1. Exterior Storefront Type Framing System, Glass and Glazing.
  - 2. Exterior Storefront Window Type Framing System, Glass and Glazing.

#### **1.3 REFERENCES**

- A. AAMA - American Architectural Manufacturers Association
  - 1. AAMA/NWWDA 101/I.S.2-97 "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors"
  - 2. AAMA 502-02 "Voluntary Specification for Field Testing of Windows and Sliding Glass Doors"
  - 3. AAMA 611-98 "Voluntary Specification for Anodized Architectural Aluminum"
  - 4. AAMA 800-92 "Voluntary Specifications and Test Methods for Sealants"
  - 5. AAMA 2603-02 "Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels"
  - 6. AAMA 2604-02 "Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels"
  - 7. AAMA 2605-02 "Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels"
  - 8. AAMA CW-10-97 "Care and Handling of Architectural Aluminum from Shop to Site"
  - 9. AAMA 101.1 Performance Class AW
  - 10. AAMA 501.7-11 Standard test method and performance specifications of a side-hinged exterior door system
- B. ASTM - American Society for Testing and Materials
  - 1. ASTM E 283-99 "Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors" 07-021 08520-2 ALUMINUM WINDOWS (361)
  - 2. ASTM E 330-97 "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference"
  - 3. ASTM E 331-00 "Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference"
  - 4. ASTM E 1886-05 "Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials"
- C. ICC – International Construction Codes
  - 1. ICC-500 2014 Tornado and Hurricane Impact and Winds
- D. FEMA P-361 - 2015 - Design And Construction Guidance for Community Shelters: March 2015 Version

#### **1.4 PERFORMANCE REQUIREMENTS**

A. Conformance to:

1. FEMA P-361, 2015, 'Standard For The Design And Constructions Of Storm Shelters', (Hurricane And Tornado Shelters)
2. ICC 500-2014, 'Standard For The Design Of Storm Shelters'
3. AAMA 101.1, 'North American Fenestration Standard For Windows, Doors, And Skylights' (Performance Grade AW-100, \*Size Tested 48.0" x 100.0")
4. AAMA 506-08, 'Voluntary Specifications for Impact And Cycle Testing Of Fenestration Products'
5. ASTM E283, 'Test Method For Determining The Rate Of Air Leakage Through Exterior Windows, Curtain Walls, And Doors Under Specified Pressure Differences Across The Specimen'
6. ASTM E330, 'Test Method For The Structural Performance Through Exterior Windows, Curtain Walls, And Doors By Uniform Static Air Pressure Difference'
7. ASTM E331, 'Test Method For Water Penetration Of Exterior Windows, Curtain Walls, And Doors  
By Uniform Static Air Pressure Difference'
8. ASTM E1886, 'Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Missile(s) and Exposed To Cyclic Pressure Differentials'
9. ASTM E1996, 'Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Windborne Debris In Hurricanes'
10. AAMA 101 (modified).

B. Structural properties:

1. Design loads Positive (inward) design pressure of 45 psf Negative (outward) design pressure of 45 psf
2. Deflection limitations:
  - a. The deflection of any door member in a direction normal to the plane of the wall when subjected to the specified design loads shall not exceed 1/175 of its clear span or 3/4" whichever is less.
  - b. For cantilevers, the span shall be taken as two times the distance between anchor centerline and end of cantilever.
  - c. The deflection shall not exceed 50% of the nominal joint width at sealant joints occurring between door members and relatively stiff building elements, or less if required by sealant manufacturer.
  - d. Upon reversal of load direction at magnitudes up to and including 1.5 times design pressures, slippage at fastened and/or clamped connections, shall not exceed 1/8".
  - e. Glass deflection at full design load shall not exceed 1/100 of its span, or 3/4" whichever is less.
  - f. Metal panel deflection shall not exceed 1/90 of its span or 3/4" whichever is less. The span shall be taken as the lesser of the distances between the horizontal or vertical support members.
3. Structural design criteria and testing requirements.
  - a. The work shall be designed to withstand the design loads and pressures specified herein. Compliance shall be demonstrated by calculations performed in accordance with accepted engineering practice.
  - b. The work shall be designed to conform to ASTM E 330. Inward and outward acting test pressures shall be equal to 1.5 times the inward and outward acting design pressures to

demonstrate a safety factor of 1.5 design pressures. Satisfactory performance at these loads shall mean no glass breakage, no permanent damage to fasteners or anchors, hardware, parts or actuating mechanisms; no malfunction of door; no permanent deformation of main door members in excess of 0.2% of their clear span.

C. Provision for thermal movement:

1. The work shall be designed to provide for such expansion and contraction of component materials as will be caused by surface temperatures ranging from 20 degrees F to a high temperature of 180 degrees F.
2. The expansion and contraction caused by this temperature differential shall not cause buckling, undue stress on glass, failure of joint seals, undue stress on structural elements, demanding loads on fasteners, reduction of performance, or other detrimental effects.

**1.5 SUBMITTALS**

- A. Shop drawings: Window location chart; typical window elevations; details of assemblies and glazing details for field-glazed units.
- B. Product data: Manufacturer's specifications and test reports from an AAMA accredited laboratory.
- C. Samples: Each specified finish for aluminum; other samples as requested.

**1.6 QUALITY ASSURANCE**

- A. Wind Design Data:
  1. Refer to Structural Drawings for design data.
  2. Design pressure: Refer to Structural Drawings.
  3. Impact Resistance: Small and Large Missile per IBC 2009.

**1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Handle and protect windows and accessories in accordance with AAMA CW-10-97 until project completion.

**1.8 WARRANTY**

- A. Windows: Warrant for one year against defects in material or workmanship under normal use.
- B. Organic finish conforming to AAMA 2605-02: warrant for ten years against chipping, peeling, cracking, chalking, or fading.

**PART 2 – PRODUCTS**

**2.1 MANUFACTURERS**

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  1. Framing – TH600 Architectural Aluminum Framing System by Insulgard Security Products
  2. Doors – TH350 FEMA Compliant Door System by Insulgard Security Products
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

**2.2 MATERIALS- GENERAL**

- A. Aluminum extrusions: produced from commercial quality 6061-T6 alloy; free from defects impairing strength and durability.

**B. FRAMING SYSTEM DESCRIPTION**

1. 6" Framing System: Head, Jamb, Sill, Mullion and Intermediate Horizontal Members: 2 1/2" x

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

ALUMINUM STOREFRONT (IMPACT & WIND  
RESISTANT SYSTEMS)  
08001-3

6"

2. Finish: Anodized Aluminum - Color as selected by Architect from manufactures standards.
3. Frames: All framing shall be totally factory fabricated (field fabrication is not acceptable). All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members. The system shall incorporate a weep design allowing any water penetration or internal condensation to flow through the system and exit to the exterior at the horizontal members.
4. Material: All components will be constructed from extruded aluminum in 6061-T6 alloy / temper, or equal.
5. Glazing Material: Insulating Glass Clad Polycarbonate – TOR-GARD NBR IG.
6. Anchors: All anchorage will be a fully concealed.
7. Gasketing: Interior glazing gaskets shall be closed cellular EPDM and Exterior gaskets will be solid EPDM, both with molded corners.

#### **C. ALUMINUM DOOR SYSTEM DESCRIPTION**

1. 2 3/8" Narrow stile door system.
  - a. Stiles: 5" X 2 3/8"
  - b. Top Rail: 2 3/4" X 2 3/8"
  - c. Bottom Rail: 8 1/2" X 2 3/8"
  - d. Muntin: 1 5/8" x 2 3/8"
  - e. Glazing Stops: 1" Face
2. Finish: Factory-applied
3. Doors: All doors shall be totally factory fabricated (field fabrication is not acceptable). All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members. The system shall incorporate a weep design allowing any water penetration or internal condensation to flow through the system and exit to the exterior at the horizontal members.
4. Material: All components will be constructed from extruded aluminum in 6061-T6 alloy / temper, or equal.
5. Glazing Material: Glass Clad Polycarbonate, Laminated Glass, IGU
6. Anchors: All anchorage will be a fully concealed
7. Gasketing: Interior glazing gaskets shall be closed cellular EPDM and Exterior gaskets will be solid EPDM
8. Hardware Required:
  - a. 2 point lock
  - b. Continuous hinge
  - c. Continuous astragal
  - d. Door coordinator
  - e. Carry open device
  - f. Panic bar
  - g. Latch lock

### **2.3 FABRICATION**

- A. Frame and Door assembly: See details on approved shop drawings

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

ALUMINUM STOREFRONT (IMPACT & WIND  
RESISTANT SYSTEMS)  
08001-4

- B. Glass Type: Insulgard Security Products, Tor-GardNBR2 (1.272")

## **2.4 FINISHES**

- A. Application: On clean extrusions free from serious surface blemishes; on exposed surfaces visible when installed.
- B. Finish: Anodized Aluminum – Color as selected from manufactures standards.
  - 1. AAMA 607.1
  - 2. Applicator must be fully compliant with all applicable environmental regulations and permits, including wastewater and heavy metal discharge.

## **PART 3 – EXECUTION**

### **3.1 PREPARATION**

- A. Prepare openings to be in tolerance, plumb, level, provide for secure anchoring, and in accordance with approved shop drawings.

### **3.2 INSTALLATION**

- A. Install windows in accordance with manufacturer's recommendations and approved shop drawings.
  - 1. Glazing contractor must be approved by the manufacturer
  - 2. Manufacturer to provide detailed installation instructions.
- B. Provide required support and securely fasten and set windows plumb, square, and level without twist or bow.
- C. Apply sealant per window and sealant manufacturer's recommendations at all specified areas as shown on shop drawings and detailed in installation instructions. Wipe off excess, and leave exposed sealant surfaces clean and smooth.

### **3.3 ADJUSTING AND CLEANING**

- A. Adjust windows and doors as necessary for weather tightness, and leave windows and doors clean and free of construction debris.

### **3.4 PROTECTION**

- A. Protect window, door glazing and frames from damage during subsequent construction activities. Replace damaged materials and building assemblies at no additional cost to the Owner.

## **END OF SECTION**

## **SECTION 08100 - STEEL DOORS AND FRAMES**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 SUMMARY**

- A. This Section includes:
  - 1. Steel Doors
  - 2. Steel Frames.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 4 Section "Unit Masonry" for building anchors into and grouting frames in masonry construction.
  - 2. Division 8 Section "Wood Doors" for solid-core wood doors installed in steel frames.
  - 3. Division 8 Section "Finish Hardware" for door hardware and weatherstripping.
  - 4. Division 8 Section "Glazing" for glass in steel doors and sidelights.
  - 5. Division 9 Section "Gypsum Board Assemblies".
  - 6. Division 9 Section "Painting".

#### **1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- C. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
  - 1. Indicate coordination of glazing frames and stops with glass and glazing requirements.
- E. Samples for initial selection in the form of manufacturer's color charts showing the full range of colors available for factory-finished doors and frames.
- F. Samples for verification of each type of exposed finish required, prepared on Samples not less than 3 by 5 inches (75 by 125 mm) and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- G. Oversize Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit certification of a testing agency acceptable to authorities having jurisdiction that each door and frame assembly has been constructed to conform to design, materials, and construction equivalent to requirements for labeled construction.

#### **1.4 QUALITY ASSURANCE**

- A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.



- B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors conform to all standard construction requirements of tested and labeled fire-rated door assemblies except for size.
  - 2. Temperature-Rise Rating: Where indicated, provide doors that have a temperature-rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked doors to promote air circulation.

## **PART 2 – PRODUCTS**

### **2.1 MANUFACTURER**

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. Pioneer Industries
  - 2. Rocky Mountain Metals, Inc.
  - 3. Republic Doors & Frames/Allegion
  - 4. Steelcraft - Allegion

### **2.2 MATERIALS**

- A. Hot-Rolled Steel Sheets and Strip: Commercial-quality carbon steel, pickled and oiled, complying with ASTM A 569 (ASTM A 569M).
- B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M)
- C. Galvannealed Steel Sheets: Galvannealed Steel Sheet: ASTM A 653/ A 653M, commercial quality, hot dipped. Coating Thickness: A60 coating.
- D. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

### **2.3 DOORS**

- A. Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules:
  - 1. Interior Doors: Grade 2, heavy-duty, Model 1, visible edge seam design, 18 gauge / minimum 0.0478-inch thick cold-rolled steel sheet faces.

2. Exterior Doors: Grade 3, heavy-duty, Model 1, visible edge seam design, 16 gauge / minimum 0.0635-inch thick A60 galvanized steel sheet faces.
- B. Door Louvers: Provide louvers according to SDI 111C for interior doors where indicated, with blades or baffles formed of 0.0239-inch- (0.6-mm-) thick cold-rolled steel sheet set into minimum 0.0359-inch- (0.9-mm-) thick steel frame.
  1. Sight-Proof Louvers: Stationary louvers constructed with inverted V- shaped or Y-shaped blades.
- C. Low Profile Lite Kits: All lite kits must be minimum 18 ga. cold rolled steel, mitered and welded corners, welded reinforcing clips at corners, counter-sunk mounting screw- holes.

## **2.4 FRAMES**

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules.
- B. Conceal fastenings, unless otherwise indicated. Fabricate frames as follows:
  1. Fabricate frames with mitered or coped and face welded corners.
  2. Interior Frames: 16 gage cold rolled steel
  3. Exterior Frames: 14 gage A60 galvanized steel.
- C. Door Silencers: Except on weather stripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.
- D. Plaster Guards: Provide minimum 0.0179-inch- (0.45-mm-) thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- E. Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry."

## **2.5 FABRICATION**

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.
  1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
    - a. Interior Doors: 3/4" Cell Honeycomb
    - b. Exterior Doors: Insulated Polystyrene
  2. Clearances:
    - a. Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between non-fire-rated pairs of doors.
    - b. Not more than 3/4 inch (19 mm) at bottom.
    - c. Fire Doors: Provide clearances according to NFPA 80.
  3. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- B. Galvanized Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvanized steel sheet according to SDI 112.
  1. At exterior locations.
  2. Where indicated.
- C. Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum 0.0635-inch- (1.6-mm-) thick galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.

- D. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- E. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.
  - 1. Unless otherwise indicated, provide thermal-rated assemblies with U- value rating of 0.41 Btu/sq. ft. x h x deg F (2.33 W/sq. m x K) or better
- F. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier.
- G. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.
  - 1. For concealed overhead door closers, provide space, cutouts, reinforcing, and provisions for fastening in top rail of doors or head of frames, as applicable.
- H. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- I. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- J. Glazing Stops: Minimum 0.0359-inch- (0.9-mm-) thick steel or 0.040-inch- (1-mm-) thick aluminum.
  - 1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
  - 2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.

## **2.6 FINISHES, GENERAL**

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes. Apply primers and organic finishes to doors and frames after fabrication.

## **2.7 GALVANIZED STEEL SHEET FINISHES**

- A. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC- Paint 20.
- B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.
  - 1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

## **2.8 STEEL SHEET FINISHES**

- A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Pretreatment: Immediately after surface preparation, apply a conversion coating of type suited to organic coating applied over it.
- C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

## **PART 3 – EXECUTION**

### **3.1 INSTALLATION**

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
  - 1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
  - 2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
  - 3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
  - 4. Install fire-rated frames according to NFPA 80.
- A. Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.
  - 1. Fire-Rated Doors: Install with clearances specified in NFPA 80.
  - 2. Smoke-Control Doors: Comply with NFPA 105.

### **3.2 ADJUSTING AND CLEANING**

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

## **END OF SECTION**

## **SECTION 08211 - WOOD DOORS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Solid core doors with wood veneer faces.
  - 2. Factory finishing of flush wood doors.
  - 3. Louvers for flush wood doors.

#### **1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.
- C. Shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for veneer matching and factory finishing and other pertinent data.
  - 1. For factory-machined doors, indicate dimensions and locations of cutouts for locksets and other cutouts adjacent to light and louver openings.
- D. Samples for initial selection in the form of color charts consisting of actual materials in small sections for the following:
  - 1. Faces of factory-finished doors with transparent finish. Show the full range of colors available for stained finishes.
  - 2. Faces of factory-finished doors with opaque finish. Show the full range of colors available.
- E. Samples for verification in the form and size indicated below:
  - 1. Corner sections of doors approximately 12 inches (300 mm) square with door faces and edgings representing the typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.

#### **1.4 QUALITY ASSURANCE**

- A. Quality Standard: Comply with the following standard:
  - 1. NWWDA Quality Standard: I.S.1-A, "Architectural Wood Flush Doors," of the National Wood Window and Door Association.
  - 2. AWI Quality Standard: "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute for grade of door, core, construction, finish, and other requirements.
- B. Fire-Rated Wood Doors: Provide wood doors that comply with NFPA 80; are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152; and are labeled and listed by UL, Warnock Hersey, or another testing and inspection agency acceptable to authorities having jurisdiction.
  - 1. Oversized Fire-Rated Wood Doors: For door assemblies exceeding sizes of tested assemblies, provide manufacturer's certificate stating that doors conform to all standard construction requirements of tested and labeled fire-door assemblies except for size.
  - 2. Temperature Rise Rating: At stairwell enclosures, provide doors that have a temperature rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.

3. Temperature Rise Rating: At stairwell enclosures, provide doors that have a temperature rise rating of 250 deg F (139 deg C) maximum in 30 minutes of fire exposure.

- C. Single-Source Responsibility: Obtain doors from one source and by a single manufacturer.

## **1.5 DELIVERY, STORAGE & HANDLING**

- A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's instructions.
  1. Comply with Technical Bulletin 420-R for delivery, storage, and handling of doors.
- B. Identify each door with individual opening numbers as designated on shop drawings, using temporary, removable, or concealed markings.

## **1.6 PROJECT CONDITIONS**

- A. Conditioning: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

## **1.7 WARRANTY**

- A. General Warranty: Door manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch (6.35 mm) in a 42-by-84-inch (1067-by-2134-mm) section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span, or do not conform to tolerance limitations of referenced quality standards.
  1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
  2. Warranty shall be in effect during the following period of time after date of Substantial Completion.
    - a. Solid Core Interior Doors: Life of installation.

# **PART 2 - PRODUCTS**

## **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering doors that may be incorporated in the Work (No other Manufacturer to be used unless prior approved by addenda)
- B. Manufacturer: Subject to compliance with requirements, provide doors by one of the following:
  1. Oshkosh Door Company; 2501 Universal Street, P.O. Box 2468, Oshkosh, WI 54904; Ph.: 920.233.6161; [www.oshkoshdoor.com](http://www.oshkoshdoor.com).
  2. VT Industries; 1000 Industrial Park, P.O. Box 490, Holstein, IA 51025; Ph.: 712.368.4381; [www.vtindustries.com](http://www.vtindustries.com).
  3. Haley Brothers, Inc.; 6291 Orangethorpe Ave., Buena Park, CA 90620; Ph.: 714.670.2112; [www.haleybros.com](http://www.haleybros.com).

## **2.2 INTERIOR FLUSH WOOD DOORS**

- A. Solid Core Doors for Transparent Finish: Comply with the following requirements:
  1. Faces: Plain Sliced White Birch, Book/Run Matching
  2. Grade: Premium "A"

3. Construction: 5 ply, Hot Pressed
  4. Core: Particleboard Core to meet or exceed ANSI/A208.1 for 1-LD-1 or 1-LD-2 door core
  5. Bonding: Stiles and rails bonded to core, then entire unit abrasive planed before veneering.
  6. Pair Matching: Required at all pairs of doors.
- B. Fire-Rated Solid Core Doors: Comply with the following requirements:
1. Faces and Grade: Provide faces and grade to match non-fire-rated doors in same area of building, unless otherwise indicated.
  2. Construction: Manufacturer's standard core construction as required to provide fire-resistance rating indicated.
  3. Edge Construction: Provide manufacturer's standard laminated-edge construction for improved screw-holding capability and split resistance compatible hardwood
  4. Pairs: Furnish formed-steel edges and astragals for pairs of fire-rated doors, unless otherwise indicated.
  5. Pairs: Provide fire-rated pairs with fire-retardant stiles that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals.

## **2.3 FABRICATION**

- A. Fabricate flush wood doors to comply with following requirements:
1. In sizes indicated for job-site fitting.
  2. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels:
    - a. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements of NFPA 80 for fire-resistance-rated doors.
  3. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame shop drawings, DHI A115-W series standards, and hardware templates.
    - a. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory machining.
    - b. Metal Astragals: Pre-machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- B. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.
1. Light Openings: Trim openings with moldings of material and profile indicated.
  2. Louvers: Factory install louvers in prepared openings.

## **2.4 SHOP PRIMING**

- A. Transparent Finish: Shop-seal faces and edges of doors for transparent finish with stain (if required), other required pretreatments, and first coat of finish as specified.

## **2.5 FACTORY FINISHING**

- A. General: Comply with referenced quality standard's requirements for factory finishing.
- B. Finish wood doors at factory.
- C. Transparent Finish: Comply with requirements indicated for grade, finish system, staining effect, and sheen.
1. Grade: Premium.
  2. Finish: AWI System TR-6 or better in Factory standard color as directed by the Architect.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine installed door frames prior to hanging door:
  - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
  - 2. Reject doors with defects.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Hardware: For installation see Division 8 Section "Door Hardware."
- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and referenced quality standard and as indicated.
  - 1. Install fire-rated doors in corresponding fire-rated frames according to requirements of NFPA 80.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
  - 1. Fitting Clearances for Non-Fire-Rated Doors: Provide 1/8 inch (3.2 mm) at jambs and heads, 1/16 inch (1.6 mm) per leaf at meeting stiles for pairs of doors, and 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4-inch (6.4-mm) clearance from bottom of door to top of threshold.
  - 2. Fitting Clearances for Fire-Rated Doors: Comply with NFPA 80.
  - 3. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
  - 4. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) on lock edge; trim stiles and rails only to extent permitted by labeling agency.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish after installation, if fitting or machining is required at the job site.

### **3.3 ADJUSTING AND PROTECTION**

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
- C. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at the time of Substantial Completion.

## **END OF SECTION**



**SECTION 08220 – FIBERGLASS REINFORCED PLASTIC (FRP) DOORS & IMPACT RESISTANT  
ALUMINUM FRAME SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

**1.2 DESCRIPTION OF WORK**

- A. The extent of each type of door is shown on the drawings and schedules. The following types of doors are required:
  - 1. Fiberglass Reinforced Plastic (FRP) Doors & Impact Resistant Aluminum Frame Systems.

**1.3 QUALITY ASSURANCE**

- A. Manufacturer's Certification: Manufacturer is to have a minimum of 25 years experience in the production of pre-hardwood and pre-assembled door systems, using the type of materials specified for this project.
- B. Installer's Qualifications: For the installation of the entrance systems, use only mechanics who are thoroughly trained and experienced in the skills required and who are completely familiar with the manufacturer's recommended methods of installation plus the requirements of this work.

**1.4 WARRANTY**

- A. Warranty all fiberglass doors for a period of 10 years against failure due to corrosion. Additionally, warranty all fiberglass doors on materials and workmanship for a period of 10 years, including warp, separation or delaminating and expansion of the core.

**1.5 TEST REPORTS AND PERFORMANCE REQUIREMENTS FOR ALUMINUM HYBRID FRP  
NARROW STILE DOORS – HURRICANE RATED**

- A. Entrance systems must comply with requirements for system performance characteristics as determined by the testing methods that follow:
  - 1. Two copies of current test reports covering the test procedures as listed are to be included with the submittals.
- B. Complete System Requirements Test: Complete system units that include door, frame and hardware are to meet the following criteria:
  - 1. FBC Protocol for TAS 201; TAS 202; TAS 203 – Pass, and the following additional minimum criteria in conjunction with the qualifications as outlined by previously referenced standards:
    - a. Thermal Transmittance Tests:
      - 1) U-factors expressed in Btu/ hr-ft (2)-F - AAMA 1503-98 - 0.58
      - 2) R-value expressed in hr-ft (2)-F/Btu - ASTM 1503-98 - 1.73
    - b. Structural Performance Tests:
      - 1) Air Infiltration –  
ASTM E283 @ 1.56 psf (25 mph) - 0.41 cfm/ft (2)  
ASTM E283 @ 6.24 psf (50 mph) – 1.06 cfm/ft (2)
      - 2) Water Penetration –  
ASTM E331 - 15 Min Cycle - NO ENTRY
      - 3) Uniform Static Load for single door- ASTM E330 - (+) - 195.0
    - c. Structural Integrity Tests:

- 1) Exit Bar Pull Off Test - 1300 lbs. minimum load resistance before exit bar disengages from door.
- 2) Closer Pull Off - 1638 lbs. minimum load resistance before closer disengages from door.
- d. Windborne Debris Resistance Tests:
  - 1) Large Missile Impact Test - SFBC PA 201 - 94 – PASSED
  - 2) Cyclic Wind Pressure Test - SFBC PA 203 - 94 - 65PSF
  - 3) Forced Entry Test - SFBC 3603.2 - 300 lbs. – PASSED
- e. Indoor Air Quality Test: ASTM D 6670-01: GREENGUARD Environmental Institute Certified including GREENGUARD for Children and Schools Certification.
- C. Face Sheet Requirements Test: FRP material and FRP face sheets with core material are to meet the following criteria:
  1. Center Door Section (face sheet/core/face sheet) Gardner Impact Test – Nominal Value, ASTM D 3029 120 in-lb.
  2. FRP Material (MR85)
    - a. Flexural Strength Test – ASTM D790 - 22,600 psi (inward) 24,400 psi(outward)
    - b. Izod Impact Strength Test – ASTM D256 - 15.36 ft-lb./in thickness
    - c. Barcol Hardness – ASTM D2583 – 50

## **1.6 SUBMITTALS**

- A. Product Technical Data Including:
  1. Acknowledgment that products submitted meet requirements of standards referenced.
  2. Manufacturer shall provide certificate of compliance with current local and federal regulations as it applies to the manufacturing process.
  3. Manufacturer's installation instructions.
  4. Schedule of doors indicating the specific reference numbers used on the owner's project documents, noting door type, frame type, size, handing and applicable hardware.
  5. Details of core and edge construction, including factory construction specifications.
  6. Certification of manufacturer's qualifications.
- B. Submittal Drawings for approval shall be submitted prior to manufacture and shall include the following Information and formatting:
  1. Summary door schedule indicating the specific reference numbers as used on owner's drawings, with columns noting door type, frame type, size, handing, accessories and hardware.
  2. A drawing depicting front and rear door elevations showing hardware with bill of material for each door.
  3. Drawing showing dimensional location of each hardware item and size of each door.
  4. Individual part drawing and specifications for each hardware item and FRP part or product.
  5. Construction and mounting detail for each frame type.

## **1.7 DELIVERY, STORAGE AND HANDLING**

- A. Each door shall be delivered individually crated for protection from damage in cardboard containers, clearly marked with project information, door location, specific reference number as shown on drawings, and shipping information. Each crate shall contain all fasteners necessary for installation as well as complete installation instructions.

1. Doors shall be stored in the original container on edge, out of inclement weather for protection against the elements.
2. Handle doors pursuant to the manufacturer's recommendations as posted on outside of crate.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURER**

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  1. Commercial Door Systems - F200-HR Series, Aluminum Hybrid FRP Doors
  2. Special-Lite - SL-17 HR Series, FRP/Aluminum Hybrid
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- C. NOTE: Manufacturer must meet all technical requirements listed herein.
- D. Door Systems Classifications: Door systems for this project are based on criteria as cited for Systems meeting FBC Protocols TAS 201, 202, 203. **Doors were tested as a unit** and as such, to meet specified criteria all specifications regarding frame and door size must be met and testing documentation outlining the unit specifics as tested must be provided.

### **2.2 MATERIALS**

- A. Aluminum Members:
  1. Doors, frames, miscellaneous components and entrance systems accessories are to be from the same manufacturer. Splitting the source for these items will not be permitted.
  2. Provide alloy and temper as recommended for resistance to corrosion and color control. Aluminum member references are ASTM B 221 for extrusions and ASTM B 209 for sheets.

### **2.3 ALUMINUM FRAMES**

- A. Standard Closed Back Frames shall be of extruded aluminum 6063-T5 alloy and a wall thickness of .125".
  1. Vertical Members: All vertical frame jambs and mullions will be full height of opening.
  2. Sections: Tube sections will be 2" x 4 1/2" with joints connected by use of reinforcing clips and machine screws.
  3. Finish to be determined by architect.
  4. Closed Back Frames are: **CDS Model 2400** or equal
  5. **NOTE: FRP Manufacturer cannot provide a Tested Impact Resistant Aluminum Frame containing Transoms or Side-lites. They can ONLY provide 3-Sided Frames.**
    - a. Impact Aluminum Frames (indicated with FRP Doors) that DO NOT contain Transoms or Side-lites MUST be provided under this section by the FRP Door Manufacturer as a tested unit.
    - b. Impact Aluminum Frames (indicated with FRP Doors) that DO contain Transoms or Side-lites MUST be supplied by Aluminum Storefront supplier per Section 08001, Aluminum Storefront – Impact and Wind Resistant Systems.

### **2.4 FIBERGLASS NARROW STILE HURRICANE RATED ALUMINUM HYBRID (FRP) DOORS**

- A. Structural Main Frame: Doors have an aluminum main frame constructed from extruded aluminum 6063 - T5 alloy. Doors are 1 3/4" thick. Main-frame tube is to be a single extruded unit measuring 1 1/2" x 2 1/2" (O.D.) on Sides; Bottom and top rail with a 6" (O.D.) tube.
- B. Main Frame Stile Wall Thickness:

1. Side Stiles Minimum 1/8" thick hinge edge wall.
  2. Side Stiles Minimum 1/8" thick face walls.
  3. Bottom Rail Minimum 1/8" thick face walls.
  4. Top Rail Minimum 1/8" thick all walls.
- C. Main Frame Joinery: Assembly for the meeting joints of the Rails and Stiles on the main-frame are to include the following:
1. Tie rods inserted into top and bottom rails.
  2. Mortise & Tenon with four-point connect fasteners (per joint).
  3. **\*\*WELDED JOINTS WILL NOT BE ACCEPTED\*\***
- D. Face Sheets: Face sheets will be fiberglass reinforced polyester, .120" thick, and have a pebble-like embossed finish. Face sheet color will be selected from manufacturer's standard color chart.
- E. FRP face sheets are MR85 HIGH IMPACT FRP MATERIAL that has been tested by ASTM S5420 Gardner Impact Test with "Mean Failure Energy" rating no lower than 411.84 in-lb. (or equal).
- F. Core Material: Core material will be 5-lb. density polyurethane with a flame spread rating of no more than 25.
1. URETHANE CORE DOORS will require a letter from the manufacturer offering a special guarantee that the FRP face sheets will not delaminate (bubble) for a period of 25 years, AND that the manufacturer will cover ALL replacement costs if delamination does occur.
- G. Edge Trim: Stile Edge Trim is an INTEGRAL part of the main frame and interlocks with the panel. Top and bottom edge trim is removable.
1. Snap on edge trim will not be accepted.
- H. Weather Stripping: Weather stripping package as provided by door manufacturer as tested and passed with unit.
- I. Hardware Reinforcing: Closer reinforcing to be 1/8" minimum aluminum plate or channel. Surface Applied Exit Device reinforcing to be 1/8" aluminum channel.
- J. Narrow Stile Hurricane (FRP) Doors are by one of the following:
1. Basis of Design: Commercial Door Systems F200-HR
  2. Approved Manufacturer: SPECIAL LITE, Hurricane Rated Model SL-17 (must provide proof of test reports to confirm hardware configuration for each set of specified hardware passes TAS protocol 201, 202, 203)
- K. Vision Lites:
1. Vision lite trim moldings will be aluminum extrusion - 6063-T5 alloy and removable from the inside only.
  2. **Door Vision Lites will be Factory glazed with insulated hurricane tested glass size.**
  3. Hurricane Rated Vision Lite not to exceed 22" x 32" inches
  4. Door Vision Lite Kits are by THE DOOR MANUFACTURER ONLY.

## 2.5 HARDWARE

- A. Hardware locations to be templated as tested for Hurricane approval.
- B. Refer to specification section 08700 for hardware requirements.

## PART 3 - EXECUTION

### **3.1 VERIFICATION**

#### **A. Verification of Conditions:**

1. Verify openings are correctly prepared to receive doors and frames.
2. Verify openings are correct size and depth in accordance with submittal drawings.

#### **B. Installer's Examination:**

1. Door installer shall examine conditions under which construction activities of this section are to be performed and submit a written report to general contractor if conditions are unacceptable.
2. General Contractor shall submit two copies of the installer's report to the architect within 24 hours of receipt.
3. Installer shall not proceed with installation until all unacceptable conditions have been corrected.

### **3.2 INSTALLATION**

- A. Doors shall be delivered at job site individually crated. Each crate to be clearly marked with the specific opening information for quick and easy identification.
- B. All single doors to be shipped completely assembled in the frame with hardware installed. Double doors to be prehung at the factory to ensure a proper fit and that hardware functions properly, then disassembled for shipping purposes.
- C. Install door opening assemblies in accordance with shop drawings and manufacturer's printed installation instructions, using installation methods and materials specified in installation instructions.
- D. Field alteration of doors or frames to accommodate field conditions is strictly prohibited. Site tolerances: Maintain plumb and level tolerance specified in manufacturer's printed installation instructions.
- E. Fire labeled doors, frames and any associated hardware must be installed by qualified professional installers in strict accordance with manufacturer's instructions and the latest revision of NFPA 80.

### **3.3 ADJUSTING**

- A. Adjust doors in accordance with the door manufacturer's maintenance instructions to swing open and shut without binding and to remain in place at any angle without being moved by gravitational influence.
- B. Adjust door hardware to operate correctly in accordance with hardware manufacturer's maintenance instruction.

### **3.4 CLEANING**

- A. Clean surfaces of door opening assemblies and exposed door hardware in accordance with respective manufacturer's maintenance instructions.

### **3.5 PROTECTION OF INSTALLED PRODUCTS**

- A. Protect door opening assemblies and door hardware from damage by subsequent construction activities until final inspection.

**END OF SECTION**

## SECTION 08330 - COILING DOORS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Overhead Coiling Service Doors.

#### 1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Support framing and framed opening.
- B. Section 08700 - Door Hardware: Product Requirements for cylinder core and keys.

#### 1.3 REFERENCES

- A. ANSI/DASMA 108 - American National Standards Institute Standard Method For Testing Sectional Garage Doors And Rolling Doors: Determination Of Structural Performance Under Uniform Static Air Pressure Difference.
- B. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
- C. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- D. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- F. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- G. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- H. NEMA MG 1 - Motors and Generators.

#### 1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Overhead coiling service doors:
  - 1. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf (958 Pa) without damage to door or assembly components in conformance with ASTM E 330.
  - 2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from onemanufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

#### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01600.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Details of construction and fabrication.
  - 4. Installation instructions.
- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.

- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

## **1.6 QUALITY ASSURANCE**

- A. Furnish each coiling door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components.
- B. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- C. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.
  - 4. Anchorages: Furnish all anchoring devices and provide setting drawings, templates, instructions and directions for installation of anchoring devices. Coordinate delivery with other work to avoid delay.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

## **1.8 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## **1.9 COORDINATION**

- A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

## **1.10 WARRANTY**

- A. Warranty: Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.
- B. Warranty: Manufacturer's limited door system warranty for 2 years for all parts and components.
- C. PowderGuard Finish
  - 1. PowderGuard Max: Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Max Finish warranty for 5 years.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: [www.overheaddoor.com](http://www.overheaddoor.com). E-mail: [info@overheaddoor.com](mailto:info@overheaddoor.com).
- B. Raynor; 1101 East River Road, Dixon, IL 61021-0448; [www.raynor.com](http://www.raynor.com); PH: 815.285.7144.
- C. Cookson; 1901 South Litchfield Road, Goodyear, AZ 85338; [www.cooksondoor.com](http://www.cooksondoor.com); PH: 800.294.4358
- D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

### 2.2 OVERHEAD COILING SERVICE DOORS

- A. Industrial Doors: Overhead Door Corporation, **Model 610 Service Doors**.
  - 1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
    - a. Flat profile type F-265 for doors up to 18 feet 4 inches (5.59 m) wide, fabricated of:
      - i. 22 gauge galvanized steel.
    - b. Flat profile type F-265 for doors between 18 feet 4 inches (5.59 m) and 25 feet 4 inches (7.72 m) wide, fabricated of:
      - i. 20 gauge galvanized steel.
    - c. Flat profile type F-265 for doors between 25 feet 4 inches (7.72 m) and 40 feet (12.19 m) wide, fabricated of:
      - i. 18 gauge galvanized steel.
  - 2. Slats and Hood Finish:
    - a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
      - i. Powder Coat:
        - 1) PowderGuard Max powder coat, color as selected by Architect.
      - ii. Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
  - 3. Weatherseals:
    - a. Vinyl bottom seal.
    - b. Guide weatherseal.
  - 4. Bottom Bar:
    - a. Two galvanized steel angles.
  - 5. Guides: Three structural steel angles.
  - 6. Brackets:
    - a. Galvanized steel to support counterbalance, curtain and hood.
  - 7. Finish; Bottom Bar, Guides, Headplate and Brackets:
    - a. Finish: PowderGuard Max powder color as selected by the Architect.
  - 8. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.



9. Hood:
  - a. 24 gauge galvanized steel with intermediate supports as required.
10. Manual Operation:
  - a. Manual push up for doors up to 96 SF.
11. Windload Design:
  - a. Standard windload shall be 20 PSF.
12. Locking:
  - a. Chain keeper locks for chain hoist operation.
13. Wall Mounting Condition:
  - a. As Indicated on drawings.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### **3.2 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.3 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.
- G. Install perimeter trim and closures.
- H. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

#### **3.4 ADJUSTING**

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

#### **3.5 CLEANING**

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.

- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

**3.6 PROTECTION**

- A. Protect installed products until completion of project.

**END OF SECTION**

## SECTION 08700 - FINISH HARDWARE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. This Section includes the following:
  - 1. Hinges.
  - 2. Key control system.
  - 3. Lock cylinders and keys.
  - 4. Lock and latch sets.
  - 5. Bolts.
  - 6. Exit devices.
  - 7. Push/pull units.
  - 8. Closers.
  - 9. Overhead holders.
  - 10. Miscellaneous door control devices.
  - 11. Door trim units.
  - 12. Protection plates.
  - 13. Weather-stripping for exterior doors.
  - 14. Sound stripping for interior doors.
  - 15. Astragals or meeting seals on pairs of doors.
  - 16. Thresholds.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 8 Section "Standard Steel Doors and Frames" for silencers integral with hollow metal frames.
  - 2. Division 8 Section "Flush Wood Doors" for factory pre-fitting and factory pre-machining of doors for door hardware.
  - 3. Division 8 Section "Aluminum Entrances and Storefronts" for aluminum entrance door hardware, except cylinders.

#### 1.3 HARDWARE ALLOWANCE

- A. Allowance of \$2,000.00 for Certified AHC (Architectural Hardware Consultant) & FDAI (Fire Door Assembly Inspector – document of certification from DHI must be provided) to visit job site upon substantial completion as directed by Architect. A written report will be required for the Owner, Architect, and Contractor.

## 1.4 QUALITY ASSURANCE

The supplier must have demonstrated willingness to coordinate field problems, and (upon reasonable compensation) to assist the Owner in re-keying and service operations. He must have a reputation for supplying quality material. Pre-bid approval is required **by Addendum 10** working days in advance of the Bid Day. The following Suppliers are accorded such approval in advance:

- a. Brabner & Hollon; Mobile, AL
- b. Mullins Building Products; Montgomery, AL
- c. Rayford & Associates, Inc.; Mobile, AL

## 1.5 SUPPLIER

A. Door hardware supplier's responsibilities shall be as follows:

1. Submittals: Submit through Contractor required product data, final hardware schedule separate keying schedule, and samples as specified in this Section, unless otherwise indicated.
2. **Hardware Review Meeting:** Hardware Supplier shall attend a scheduled "Hardware Review Meeting" with the Contractor, Owner and Architect representative. All Hardware products, hardware installation locations, finishes, color selections, ratings and keying is to be reviewed and discussed. The Hardware Supplier understands the Hardware Submittal is not deemed "Fully Approved" until the Owner has completed their review and given "Approval".
3. Construction Schedule: Inform Contractor promptly of estimated times and dates that will be required to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing door hardware for purposes of including this data in construction schedule. Comply with this schedule.
4. Coordination and Templates: Assist Contractor as required to coordinate hardware with other work in respect to both fabrication and installation. Furnish Contractor with templates and deliver hardware to proper locations.
5. Product Handling: Package, identify, deliver, and inventory door hardware specified in this Section.
6. Discrepancies: Based on requirements indicated in Contract Documents in effect at time of door hardware selection, furnish types, finishes, and quantities of door hardware, including fasteners, and Owner's maintenance tools required to comply with specified requirements and as needed to install and maintain hardware. Furnish or replace any items of door hardware resulting from shortages and incorrect items at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

B. Contractor's responsibilities shall be as follows:

1. Submittals: Coordinate and process submittals for door hardware in same manner as submittals for other work.
2. **Hardware Review Meeting:** Contractor is to schedule and attend a "Hardware Review Meeting" with the Owner, Hardware Supplier and Architect Representative. All Hardware products, hardware installation locations, finishes, color selections, ratings and keying is to be reviewed and discussed. The Contractor understands the Hardware Submittal is not deemed "Fully Approved" until the Owner has completed their review and given "Approval".
3. Construction Schedule: Cooperate with door hardware supplier in establishing scheduled dates for submittals and delivery of templates and door hardware. Incorporate in construction schedule the times and dates related to furnishing hardware by door hardware supplier.

4. Coordination: Coordinate door hardware with other Work. Furnish hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier. Coordinate all wiring, raceways, accesses and final connections to all electronic devices and components per manufacturer requirements for a fully functioning system.
5. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials.
6. Installation Information: The general types and approximate quantities of hardware required for this Project are indicated at the end of this Section in order to establish Contractor's costs for installation and other work not included in allowance.
7. No adjustments in Contract sum will be made for costs other than those covered by the allowances for subsequent increases or decreases in quantity of one or more hardware types that do not exceed 5 percent.

## **1.6 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  1. Upon return of the reviewed finish hardware schedule, arrange for a meeting with the Owner and representatives of Architect. A keying schedule will be established and submitted to the Architect and Owner. After review, the keying schedule will be returned to representatives of Finish Hardware Supplier so that permanent cylinders and keys can be prepared on a timely basis.

## **1.7 QUALITY ASSURANCE**

- A. Substitutions: All substitution requests must be submitted before bidding and within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the architect and his hardware consultant.
- B. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- C. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for a minimum of 10 years, for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced "Certified" architectural hardware consultant (AHC)" as recognized by the Door and hardware Institute (DHI). All submittals shall be signed by an AHC who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.
- D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

## **1.8 PRODUCT HANDLING**

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).
- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

## **1.9 MAINTENANCE**

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

# **PART 2 - PRODUCTS**

## **2.1 HINGES**

### **A. MANUFACTURERES**

- 1. Hager
- 2. McKinney
- 3. Stanley

### **B. MATERIAL:**

- 1. Provide only template produced units.
- 2. Provide Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.
- 3. Hinge pins, except as noted, are to be provided as follows:
  - a. Steel Hinges: Steel pins
  - b. Non-ferrous Hinges: Stainless steel pins
  - c. Exterior Doors: Use Non-Removable Pins
  - d. Interior Doors: Non-rising pins
  - e. Electric Hinges: Non-removable pins
- 4. Tips shall be flat button and matching plug, finished to match leaves.
- 5. Provide number of hinges indicated but not less than three (3) hinges for door leaf of 90" or less in height and one additional hinge for each 30" of additional height.

6. Provide ball bearing hinges of the type and weight suggested by the hinge manufacturer for each type of door application.

## **2.2 CONTINUOUS GEARED HINGES**

### **A. MANUFACTURERES**

1. Hager Companies
2. ABH Manufacturing
3. SELECT Products Ltd
4. Stanley
5. National Guard Products

### **B. MATERIAL:**

1. Fully Concealed Hinges, Heavy Duty
2. Conform to ANSI/BHMA A156.26-2006 Grade 1.
3. Typical hinge height shall be 1" less than nominal door height.

## **2.3 LOCK CYLINERS AND KEYING**

### **A. MANUFACTURERES**

1. All cylinders must be keyed to the existing system for **Baldwin County Board of Education**

### **B. MATERIAL**

1. Keys shall be furnished as follows:
  - a. 3 each Change Keys per core/or keyed alike group
  - b. 3 each Grand Master Key
  - c. 3 each Master Key per level
  - d. 3 each Control Key
2. Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall expansion capacity of 150% of the number of locks required for the project.
- 3.

## **2.4 ELECTRONIC HARDWARE**

### **A. MANUFACTURERES**

1. Basis of design is Stanley Wi-Q Technology
2. Stanley/Precision
3. Dormakaba
4. Alarm Lock
5. *Note: A Mandatory meeting will be required for Hardware Supplier concerning all special openings requiring electronic hardware (see Hardware Sets). No material is to be ordered*

*until verified at this meeting. Meetings will be as directed by architect including design consultant, contractor, and owner representative.*

## **2.5 LOCKSETS AND LATCHSETS**

### **A. MANUFACTURERES**

1. Stanley/Best 9K3 Series, 15D Design
2. No Sub – Owners Standard

### **B. MATERIAL**

1. Locksets and latch-sets of all manufacturers must conform to the requirements of Sub paragraphs 2 and be approved by the Architect.
2. Cylindrical Lock Type
  - a. Locksets and latch sets must conform to ANSI A156.2 Series 4000, Operational Grade 1, and be UL Listed.
- OR
3. Mortise Type
  - a. Locksets and latch sets must conform to ANSI A156.2 Series 1000, Grade 1, and be UL Listed
  - b. Locksets and latch-sets must be heavy duty mortise type with 2-3/4 in. backset, or greater as specified, with a 3/4-inch throw latch-bolt.
  - c. Locksets shall be furnished with a cylinder housing that accepts a small format interchangeable core. Cores must be furnished by Best Access Systems.

## **2.6 EXIT DEVICES**

### **A. MANUFACTURERES**

1. Sargent 8800 Series x ET Trim Design
2. Best/Precision Apex 2000 Series x 4900D Trim Design
3. Von Duprin 98/99 Series x 996L Trim Design

### **B. MATERIAL**

1. All exit devices to be of one manufacturer and provided in the same finish and lever design as locksets.
2. Provide sex nuts and bolts for attachment of surface applied items to doors.
3. Devices shall be UL listed. Devices for fire rated openings shall bear factory installed UL markings that indicate approval for fire rated openings.
4. All exit devices shall be touch-bar type design and Grooved aluminum extrusions are not allowed.
5. All exit devices shall comply with ANSI A156.3, Grade 1.
6. Exit devices must meet hurricane code where required.



7. Exit device lever trim shall be match Lockset 15D design.

## **2.7 CLOSERS**

### **A. MANUFACTURERES**

1. LCN – 4040XP Series
2. Stanley/Best – HD8000 Series
3. Hager Companies - 5100 Series

### **B. MATERIAL**

1. Size of units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.
  - a. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.
  - b. Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units, ANSI opening force and delayed action closing.
2. Provide manual closers that are certified to exceed ten million (10,000,000) full load operating cycles by a recognized independent testing laboratory. Closers are to be fully hydraulic, rack and pinion action with high strength cast aluminum or cast-iron cylinders and one-piece forged steel pistons. Hydraulic fluid to be of a type requiring no seasonal adjustments for temperature. Hydraulic regulation to be controlled by tamper-proof, non-critical screw valves, adjustable with a hex by tamper-proof, non-critical screw valves, adjustable with a hex wrench. Separate adjustments for back check, general speed, and latch speed. Where detailed on double lever arm closers, provide a delayed action feature to delay closing up to one minute for maximum opening to approximately 75 degrees. The back check shall be properly located for protection of the door, frame and applied hardware.
2. Use of closers with built-in spring or cushion stops will be allowed in lieu of overhead stops.
3. All door closers shall comply with ANSI A156.4 Grade 1 and meet the standards of ANSI A117.1 for barrier-free accessibility.

## **2.8 OVERHEAD STOPS AND HOLDERS**

### **A. MANUFACTURERES**

1. Dormakaba
2. ABH Manufacturing
3. Hager Companies

### **B. MATERIAL**

1. Conform to ANSI A156.8 Grade 1.
2. Surface Mount, Heavy or Medium Duty (refer to hardware sets)

## **2.9 PUSH/PULLS & PROTECTION PLATES**

A. MANUFACTURERES

1. Hager Companies
2. Burns Mfgr.
3. Trimco Hardware

B. MATERIAL

1. Provide manufacturers standard exposed fasteners for installation, through bolted for matched pairs, but not of single units.
2. Provide 16-gauge minimum thickness for plates.
3. Where specified in the schedule, push/pulls shall have an antimicrobial coating.

**2.10 THRESHOLDS, WEATHERSTRIPPING & GASKETING**

A. MANUFACTURERES

1. Zero
2. Hager
3. National Guard

B. MATERIAL

1. Provide continuous weather-stripping at each edge of every exterior door leaf, except as otherwise indicated.
2. Provide type, size and profile shown as scheduled.
3. Provide non-corrosive fasteners as recommended by manufacturer for application indicated. Do not specify adhesive backed weather-strip or gasket material.
4. Where replaceable seal strips are scheduled, provide only those units where resilient or flexible seal strip is easily replaceable from stocks maintained by manufacturer.
5. Proved standard metal threshold unit of type, size and profile shown as scheduled.

**2.11 FINISHES**

- A. Hardware finishes shall conform to ANSI and shall be as listed below for aluminum, FRP, hollow metal and wood doors:

B. Finishes Table:

Butt Hinges	652 Satin Chrome Plated Steel
Continuous Geared Aluminum Hinges	628 Clear Anodized Aluminum, except at aluminum storefront doors. At Aluminum storefront doors, provide anodized or Kynar finish as required to match specified door finish.
Cont. Pin & Barrel Hinges	630 Satin Stainless Steel
Flush Bolts	626 Satin Chrome Plated
Locksets	626 Satin Chrome Plated
Exit Devices	630/626 Satin Chrome Plated
Door Closers	689 Powder Coat Aluminum
Push Plates	630 Satin Stainless Steel

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

FINISH HARDWARE  
08700-8

Pull Plates	630 Satin Stainless Steel
Protective Plates	630 Satin Stainless Steel
Door Stops	626 Satin Chrome Plated
Overhead Holders	630 Satin Stainless Steel

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Install each hardware item in compliance with manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, reinstall each item.
  - 1. Do not install surface mounted items until finishes have been completed on the substrate.
- B. Conform to ANSI A117.1 for positioning requirements for the handicapped.

#### **3.2 PROTECTION AND CLEANING**

- A. After installation, clean metal surfaces on both interior and exterior of all mortar, paint and other contaminants. After cleaning, protect work against damage.

#### **3.3 FINAL ADJUSTMENT**

- A. Whenever hardware is installed more than one month prior to occupancy or acceptance, return during the week prior to acceptance or occupancy and make a final inspection and adjustment of all hardware items in such space or area.

#### **3.4 HARDWARE SCHEDULE**

##### **Manufacturer List**

<u>Code</u>	<u>Name</u>
AB	ABH Manufacturing Inc.
BE	Best Access Systems
LU	Lund Key Cabinets
PR	Precision/Best
BE	Best Door Closers
SP	Special Lite
ST	Stanley/Best
HA	Hager

##### **Option List**

<u>Code</u>	<u>Description</u>
C4	CAM-STANDARD CAM
CD	CYLINDER DOGGING
HC	Hurricane Code Device
SN	Sex Nuts (Pkg. of 4)
B4E	BEVELED 4 EDGES - KICK PLATES
CSK	COUNTER SINKING OF KICK and MOP PLATES
S301	OPT. ROLLER. STRK - RIM AND TOP OF SVR

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

FINISH HARDWARE  
08700-9

CA-03	Cylinder Attachment Kit (Rim/SVR Device)
SNB (2)	SEX BOLTS (2)
SNB (6)	SEX BOLTS (6)

#### Finish List

<u>Code</u>	<u>Description</u>
C	Clear Anodized Aluminum
AL	Aluminum
600	Primed for Painting
626	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
US26D	Chromium Plated, Dull
US32D	Stainless Steel, Dull

#### Hardware Sets

##### SET #E01

Exterior Entry FRP Doors x Aluminum Frame A101A.

2	Continuous Hinge	661HD UL 83"	AL	ST
1	Rim Exit Device (Active Leaf)	HC 2103 36" CA-03 CD S301 SNB (2)	630	PR
1	Rim Exit Device	HC 2101 36" CA-03 CD S301 SNB (2)	630	PR
1	Removable Mullion	HCKR822 MCS822	600	PR
2	Rim Cylinder	12E-72 STD	626	BE
2	Mortise Cylinder	1E-74 STD C4	626	BE
4	Construction Core	1C-7 Green	GN	BE
2	Flush Pull	SL86	C	SP
2	Door Closer	HD8016 SDST	689	BE
2	Door Sweep	750SN x LAR		HA
1	Rain Drip	810S x LAR		HA
1	Threshold	520S N x LAR		HA

NOTE: Flush Pulls supplied, and Factory installed.

NOTE: Weather-seals are Factory installed in ALSF Frame.

##### SET #E02

Exterior Entry FRP Door x Aluminum Tube Frame A101C, A105.

1	Continuous Hinge	661HD UL 83"	AL	ST
1	Exit Device	HC 2103 36" CA-03 CD S301 SNB (2)	630	PR
1	Rim Cylinder	12E-72 STD	626	BE
1	Mortise Cylinder	1E-74 STD C4	626	BE
2	Construction Core	1C-7 Green	GN	BE
1	Flush Pull	SL86	C	SP

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

FINISH HARDWARE  
08700-10

1 Door Closer	HD8016 SDST	689	BE
1 Door Sweep	750SN x LAR		HA
1 Rain Drip	810S x LAR		HA
1 Threshold	520S N x LAR		HA

NOTE: Flush Pulls supplied, and Factory installed.

NOTE: Weather-seals are Factory Installed in Tube Frames.

#### SET #01

Sgl. Interior Egress Door A105.

1 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device	2114 x 4914 36" S301 SNB (2)	630	PR
1 Door Closer	HD8016 SDST	689	BE
1 Kick Plate	190S 10" x 34" B4E CSK	630	HA
3 Silencers	307D	Grey	HA

#### SET #02

Sgl. Interior Janitor Door A102 & Sound Room A106.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Storeroom Lockset	9K3-7D15D S3 STD	626	BE
1 Construction Core	1C-7 Green	GN	BE
1 Door Closer	HD8016 FHP	689	BE
1 Kick Plate	190S 10" x 34" B4E CSK	630	HA
1 Wall Bumper	232W	630	HA
3 Silencers	307D	Grey	HA

#### SET #03

Interior Sgl. Restroom Door A103.

3 Hinges (HW)	FBF168 4 1/2 X 4 1/2	26D	ST
1 Push Plate	30S 8" x 16"	630	HA
1 Pull Plate	H33G 4" x 16"	630	HA
1 Door Closer	HD8016 FHP	689	BE
1 Kick Plate	190S 10" x 34" B4E CSK	630	HA
1 Mop Plate	190S 6" x 35" B4E CSK	630	HA
1 Wall Bumper	236W	630	HA
3 Silencers	307D	Grey	HA

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

FINISH HARDWARE  
08700-11

**SET #04**

Interior Sgl. Restroom Door A104.

3 Hinges (HW)	FBF168 4 1/2 X 4 1/2	26D	ST
1 Push Plate	30S 8" x 16"	630	HA
1 Pull Plate	H33G 4" x 16"	630	HA
1 Door Closer	HD8016 FHP	689	BE
1 Kick Plate	190S 10" x 34" B4E CSK	630	HA
1 Mop Plate	190S 6" x 35" B4E CSK	630	HA
1 Floor Stop	245F	626	HA
3 Silencers	307D	Grey	HA

**NOTES:**

- A) INSTALL ALL DOOR CLOSERS AWAY FROM CORRIDORS AND PUBLIC VIEW.
- B) ALL EXTERIOR & INTERIOR CYLINDERS AND LOCKSETS TO HAVE KEYED CONSTRUCTION CORES THROUGH-OUT THE CONSTRUCTION PHASE.

END OF SECTION 087100

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

MCKEE PROJECT NO. 23.192

FINISH HARDWARE  
08700-13

## **SECTION 08800 – GLAZING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes:
  - 1. Glass for windows
  - 2. Glass for doors
  - 3. Glass for interior borrowed lites
  - 4. Glass for storefront framing.
  - 5. Glazing sealants and accessories.

#### **1.2 DEFINITIONS**

- A. Glass Manufacturers: Firms that produce primary glass as defined in referenced glazing publications.
- B. Glass Fabricators: Firms that produce the fabricated glass products. Fabrication processes include cutting, heat processing, insulating, spandrel, laminating and other as fabrication activities defined in referenced glazing publications.

#### **1.3 REFERENCE STANDARDS**

- A. American Society of Test and Material (ASTM)
  - 1. ASTM C1036: Standard Specification for Flat Glass
  - 2. ASTM C1048: Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass
  - 3. ASTM C1172: Standard Specification for Laminated Architectural Flat Glass
  - 4. ASTM C1376: Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Glass.
  - 5. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
  - 6. ASTM E1886: Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
  - 7. ASTM E1996: Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes
  - 8. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation
- B. American National Standards Institute (ANSI)
  - 1. ANSI z97.1: For Safety Glazing Materials Used In Buildings - Safety Performance Specifications And Methods Of Test
- C. Consumer Products Safety Commission
  - 1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials
- D. International Code Council
  - 1. ICC 500: ICC/NSSA Standard for the Design and Construction of Storm Shelters
- E. Underwriters Laboratory (UL)
  - 1. UL 263: Standard for Fire Tests of Building Construction and Material
  - 2. UL 9: Standard for Fire test of Window Assemblies
  - 3. UL 10B: Standard for Fire Tests of Door Assemblies



4. UL 10C: Standard for Positive Pressure Fire Tests of Door Assemblies
- F. National Fire Protection Association (NFPA)
  1. NFPA 80: Standard for Fire Doors and Other Opening Protectives
  2. NFPA 257: Standard on Fire Test for Window and Glass Block Assemblies
  3. NFPA 252: Standard Methods of Fire Test of Door Assemblies

#### **1.4 COORDINATION**

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product provide performance characteristics, certificates of compliance, installation instructions, and cleaning and maintenance instructions.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12" x 12" inches (300 mm) square. For each type of sealant/gasket exposed to view; 12" length sample. Install sealant/gasket sample between two strips of materials representative of adjoining framing system in color.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Preconstruction adhesion and compatibility test report.

#### **1.7 QUALITY ASSURANCE**

- A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- B. Single Source Responsibility: Provide materials obtained from one source for each type of glass and glazing product indicated

#### **1.8 PRECONSTRUCTION TESTING**

Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

#### **1.9 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

#### **1.10 PROJECT CONDITIONS**

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes. Install glazing sealants only when temperatures are in middle third of manufacturer's recommended installation temperature range.

## **1.11 WARRANTY**

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
  - 1. Warranty Period: Ten (10) years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  - 1. Warranty Period: Five (5) years from date of Substantial Completion.
- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
  - 1. Warranty Period: Ten (10) years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Approved Manufacturers: Subject to compliance with requirements, provide AGC Glass North America, Inc or approved equal product by one of the following:
  - 1. AGC Glass North America (Basis of Design)
  - 2. Pilkington North America
  - 3. Viracon
- B. Approved Fabricators: Subject to compliance with requirements
  - 1. American Insulated Glass
  - 2. OldCastle Building Envelope
  - 3. Trulite Glass and Aluminum Solutions
  - 4. Tristar Glass

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer to design glazing. A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.
  - 1. Design Wind Pressures: As indicated on Drawings.
  - 2. Design Snow Loads: As indicated on Drawings.
- C. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

- D. Windborne-Debris-Impact Resistance: Exterior glazing shall comply with protection testing requirements in ASTM E 1996 for Wind Zones when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.
  - 1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.
  - 2. Small-Missile Test: For glazing located more than 30 feet (9.1 m) above grade.
- E. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- F. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
  - 1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 7.3 computer program, expressed as Btu/sq. ft. x h x deg F.
  - 2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBNL's WINDOW 7.3 computer program.
  - 3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

## **2.3 GLASS PRODUCTS, GENERAL**

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. GANA Publications: "Laminated Glazing Reference Manual", "Glazing Manual", and "Sealant Manual".
  - 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
  - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
  - 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.
- F. Heat-Treated Float Glass: Where heat treated float glass is required or indicated provide glass in accordance to ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
  - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
  - 2. For uncoated glass, comply with requirements for Condition A.

3. For coated vision glass, comply with requirements for Condition C (other coated glass).

## **2.4 GLASS PRODUCTS**

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.  
Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
- C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
- D. Sputtered Coated Low-Emissivity Clear Vision Glass, ASTM C 1376, Kind CV (coated vision glass), coated by sputtered process, ASTM C 1036, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
- E. Pyrolytic Coated Low-Emissivity Clear Vision Glass, ASTM C 1376, Kind CO (coated overhead glass), coated by pyrolytic process, ASTM C 1036, Type I, Class 1 (clear) or Class 2 as indicated, Quality-Q3.
- F. Ceramic-Coated Vision Glass: ASTM C 1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in GANA's "Engineering Standards Manual."
- G. Reflective-Coated Vision Glass: ASTM C 1376.

## **2.5 LAMINATED GLASS**

- A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation
  1. Construction: Laminate glass with polyvinyl butyral interlayer or ionoplast interlayer to comply with interlayer manufacturer's written instructions.
  2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
  3. Interlayer Color: Clear unless otherwise indicated.
- B. Windborne-Debris-Impact-Resistant Laminated Glass: Comply with requirements specified above for laminated glass except laminate glass with one of the following to comply with interlayer manufacturer's written instructions:
  1. Polyvinyl butyral interlayer.
  2. Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.
  3. Ionoplast interlayer.

## **2.6 INSULATING GLASS**

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
  1. Sealing System: Dual seals.
    - a. Primary Seal: Polyisobutylene
    - b. Secondary Seal: Two-part Silicone
  2. Spacer: Manufacturer's standard spacer material and construction
    - a. Color: As select by architect from fabricators full range of colors

## **2.7 FIRE PROTECTIVE-RATED GLASS**

- A. Fire -Protective -Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire -protection ratings indicated, based on positive -pressure testing according to NFPA 257 or UL 9, including the hose -stream test, and shall comply with NFPA 80.

1. Fire -protection -rated glazing required to have a fire -protection rating of 20 minutes shall be exempt from the hose -stream test.
- B. Fire -Protective -Rated Glazing Labeling: Permanently mark fire -protection -rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether or not glazing has passed the hose -stream test; whether or not glazing meets 450 deg F (250 deg C) temperature -rise limitation; and the fire -resistance rating in minutes.
- C. Fire -Protective -Rated Tempered Glass: 6 -mm thickness, fire -protection -rated tempered glass; and complying with 16 CFR 1201, Category II.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Safti First; SuperLite I
    - b. Technical Glass Products; Fireglass20
    - c. Vetrotech Saint-Gobain; SSG Pyroswiss US
  1. Fire-Protective Rated Ceramic: 5mm thickness, fire protective rated ceramic, non-safety ratedProducts: Subject to compliance with requirements, provide one of the following:
    - a. Schott Pyran Platinum
    - b. Technical Glass Products Firelite
- D. Fire-Protective Rated Ceramic-Filmed: 5mm thickness, fire protective rated ceramic, safety rated, complying with 16 CFR 1201, Category II
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Schott Pyran Platinum-F
    - b. Technical Glass Products Firelite-NT
- E. Fire-Protective Rated Ceramic-Laminated: 9mm thickness, fire protective rated ceramic, safety rated, complying with 16 CFR 1201, Category II
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Schott Pyran Platinum-L
    - b. Technical Glass Products Firelite-Plus

## **2.8 FIRE -RESISTANCE -RATED GLAZING**

- A. Fire -Resistance -Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire -resistance ratings indicated, based on testing according to ASTM E 119 or UL 263.
- B. Fire -Resistance -Rated Glazing Labeling: Permanently mark fire -resistance -rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, that the glazing is approved for use in walls, and the fire -resistance rating in minutes.
- C. Fire-Resistance Rated Intumescent Glazing: 16mm-52mm thickness, multiply constructed laminated with fire resistive intumescent interlayers, and complying with 16 CRF 1201, Category II.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. AGC Glass - Pyrobel
    - b. Pilkington - Pyrostop

## **2.9 GLAZING SEALANTS**

- A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dow Corning Corporation.
    - b. GE Construction Sealants; Momentive Performance Materials Inc.
    - c. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - d. Pecora Corporation.
    - e. Sika Corporation.
    - f. Tremco Incorporated.
- C. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. BASF Corporation-Construction Systems.
    - b. Dow Corning Corporation.
    - c. GE Construction Sealants; Momentive Performance Materials Inc.
    - d. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - e. Pecora Corporation.
    - f. Polymeric Systems, Inc.
    - g. Sika Corporation.
    - h. Tremco Incorporated.
- D. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.
    - b. Dow Corning Corporation.
    - c. GE Construction Sealants; Momentive Performance Materials Inc.
    - d. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - e. Polymeric Systems, Inc.
    - f. Schnee-Morehead, Inc., an ITW company.
    - g. Sika Corporation.
    - h. Tremco Incorporated.

- E. Glazing Sealant: Acid-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. BASF Corporation-Construction Systems.
    - b. Bostik, Inc.
    - c. Dow Corning Corporation.
    - d. GE Construction Sealants; Momentive Performance Materials Inc.
    - e. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - f. Pecora Corporation.
    - g. Polymeric Systems, Inc.
    - h. Schnee-Morehead, Inc., an ITW company.
    - i. Sika Corporation.
    - j. Tremco Incorporated.
- F. Glazing Compounds for Fire-rated Glazing Materials
  - 1. Glazing Compound: DAP 33 putty
  - 2. Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S;
  - 3. Grade NS; Class 25 with additional movement capability of 50 percent in both extension
  - 4. and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products:
    - a. Dow Corning 795 - Dow Corning Corp.
    - b. Silglaze-II 2800 - General Electric Co.
    - c. Spectrem 2 - Tremco Inc

## **2.10 GLAZING TAPES**

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
  - 1. AAMA 804.3 tape, where indicated.
  - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
  - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.
- C. Fire-rated Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 1,393 sq. inches for 90-minute ratings must be glazed with fire-rated glazing tape supplied by manufacturer.

## **2.11 MISCELLANEOUS GLAZING MATERIALS**

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

- B. Non-Fire Rated Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Fire-rated Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## **PART 3 - EXECUTION**

### **3.1 GLAZING, GENERAL**

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

### **3.2 TAPE GLAZING**

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Apply heel bead of elastomeric sealant where indicated.
- F. Center glass lites in openings on setting block and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape where indicated.



### 3.3 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### 3.4 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### 3.5 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.

Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

  - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- B. Remove and replace glass that is damaged during construction period.
- C. Wash glass on both faces not more than 4 days prior to date scheduled for inspection intended to establish date of substantial completion in each area of the project. Wash glass with methods as recommended by glass manufacturer.

### 3.6 MONOLITHIC GLASS SCHEDULE

- A. Glass Type [GL-1]: Clear fully tempered float glass.
  - 1. Minimum Thickness: 6 mm.
  - 2. Visible Light Transmittance: 88 percent minimum.
  - 3. Solar Heat Gain Coefficient: .84 maximum.
  - 4. Safety glazing required.
- B. Glass Type [GL-2]: Tinted fully tempered float glass.
  - 1. Basis-of-Design Product: AGC Glass Company North America; Solarshield.

2. Tint Color: Solarshield Pure Grey
3. Minimum Thickness: 6 mm.
4. Visible Light Transmittance: 45 percent minimum.
5. Solar Heat Gain Coefficient: .60 maximum.
6. Safety glazing required.

### 3.7 INSULATING GLASS SCHEDULE

- A. Glass Type [IG-3]: Tinted Low-E insulating glass.
  1. Basis-of-Design Product: AGC Glass North America; Energy Select 25.
  2. Overall Unit Thickness: 1 inch (25 mm).
  3. Minimum Thickness of Each Glass Lite: 6 mm.
  4. Outdoor Lite: Tinted fully tempered float glass.
  5. Tint Color: Solarshield Pure Grey, Bronze or Forest Green.
    - a. Color to be selected by Architect after Bid Date.
  6. Interspace Content: Air.
  7. Indoor Lite: Clear fully tempered float glass.
  8. Low-E Coating: Sputtered on second surface
  9. Winter Nighttime U-Factor: .29 maximum.
  10. Summer Daytime U-Factor: .27 maximum.
  11. Visible Light Transmittance:
    - a. Pure Grey -36 percent minimum.
    - b. Bronze -39 percent minimum.
    - c. Forest Green -48 percent minimum.
  12. Solar Heat Gain Coefficient:
    - a. Pure Grey -.25 maximum.
    - b. Bronze -.27 maximum.
    - c. Forest Green -.26 maximum.
  13. Safety glazing required.

### 3.8 INSULATING-LAMINATED-GLASS SCHEDULE

- A. Glass Type [IGLM-2]: Tinted Low-E Large Missile Laminated insulating glass.
  1. Basis-of-Design Product: AGC Glass North America; Energy Select 25 Pure Grey.
  2. Overall Unit Thickness: 1-5/16 inch (33 mm).
  3. Minimum Thickness of Outdoor Lite: 1/4 inch (6 mm).
  4. Outdoor Lite: Tinted Fully tempered float glass.
  5. Tint Color: Solarshield Pure Grey, Bronze or Forest Green.
    - a. Color to be selected by Architect after Bid Date.
  6. Interspace Content: Air.
  7. Indoor Lite: Clear laminated glass with two plies of heat strengthened float glass.
    - a. Minimum Thickness of Each Glass Ply: 1/4 inch (6 mm).
    - b. Interlayer Thickness: 0.090 inch (2.26 mm) minimum.

8. Low-E Coating: Sputtered on second surface.
  9. Winter Nighttime U-Factor: .28 maximum.
  10. Summer Daytime U-Factor: .26 maximum.
  11. Visible Light Transmittance: 35 percent minimum.
  12. Solar Heat Gain Coefficient: .25 maximum.
  13. Safety glazing required.
  14. Certification: Third party certification required
- B. Glass Type [**IGSM-2**]: Tinted Low-E Small Missile Laminated insulating glass.
1. Basis-of-Design Product: AGC Glass North America; Energy Select 25 Pure Grey.
  2. Overall Unit Thickness: 1-5/16 inch (33 mm).
  3. Minimum Thickness of Outdoor Lite: 1/4 inch (6 mm).
  4. Outdoor Lite: Tinted Fully tempered float glass.
  5. Tint Color: Solarshield Pure Grey, Bronze or Forest Green.
    - a. Color to be selected by Architect after Bid Date.
  6. Interspace Content: Air.
  7. Indoor Lite: Clear laminated glass with two plies of heat strengthened float glass.
    - a. Minimum Thickness of Each Glass Ply: 1/4 inch (6 mm).
    - b. Interlayer Thickness: 0.060 inch (1.52 mm) minimum.
  8. Low-E Coating: Sputtered on second surface.
  9. Winter Nighttime U-Factor: .28 maximum.
  10. Summer Daytime U-Factor: .26 maximum.
  11. Visible Light Transmittance: 35 percent minimum.
  12. Solar Heat Gain Coefficient: .25 maximum.
  13. Safety glazing required.
  14. Certification: Third party certification required

**END OF SECTION**

## **SECTION 09510 - ACOUSTICAL CEILINGS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### **1.2 SUMMARY**

- A. Extent of acoustical ceilings specified in this section include the following:
  - 1. Acoustical lay-in panel ceilings in an exposed suspended metal grid system.

##### **SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
  - 1. Full size sample of each acoustical panel type, pattern and color.
  - 2. Set of 12" long samples of exposed runners and moldings for each color and system type required.
- B. Certificates: Submit certificates from manufacturers of acoustical ceiling units and suspension systems attesting that their products comply with specification requirements.

#### **1.3 QUALITY ASSURANCE**

- A. Fire Performance Characteristics: Provide acoustical ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate marking of applicable testing and inspecting agency.
  - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84.
  - 2. Flame Spread: 25 or less.
  - 3. Smoke Developed: 50 or less.
- B. Fire Resistance Ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane; tested per ASTM E 119. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated for rated assembly.
- C. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by, or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).
- D. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

#### **1.5 PROJECT CONDITIONS**

- A. Space Enclosures: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete

and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

USG Interiors, LLC. (Basis of Design) | [www.usg.com](http://www.usg.com) | Ph: 1.800.950.3839

1. Certainteed Corporation | [www.certainteed.com](http://www.certainteed.com) | Ph: 1.800.233.8990
2. Armstrong World Industries Inc. | [www.armstrongceilings.com](http://www.armstrongceilings.com) | Ph: 877.276.7876

- B. Equal products of other manufacturers may be used in the work provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

### **2.2 GENERAL ACOUSTICAL CEILING TILE UNITS**

- A. Standard for Acoustical Ceiling Tile Units: Provide manufacturer's standard units of configuration indicated which are prepared for mounting method designated and which comply with FS SS-S-118 requirements, including those indicated by reference to type, form, pattern, grade (NRC or NIC' as applicable), light reflectance coefficient (LR), edge detail, and joint detail (if any).

1. Mounting Method for Measuring NRC: No. 7 (mechanically mounted on special metal support), FS SS-S-118; or Type E-400 mounting as per ASTM E 795.

- B. Sound Attenuation Performance: Provide acoustical ceiling units with ratings for ceiling sound transmission class (STC) of range indicated as determined according to AMA 1-II "Ceiling Sound Transmission Test by Two-Room Method" with ceilings continuous at partitions and supported by a metal suspension system of type appropriate for ceiling unit of configuration indicated (concealed for tile, exposed for panels).

- C. Colors, Textures and Patterns: Provide products to match appearance characteristics indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors, surface textures, and patterns available for acoustical ceiling units and exposed metal suspension system members of quality designated.

### **2.3 ACOUSTICAL TILES**

#### **A. Acoustical Panel Type: Vinyl Covered Ceiling Panels**

1. USG "Sheetrock Brand Clean Room Lay-In Gypsum Panels".
2. Classification: Provide ceiling panels complying with ASTM E 1264 for type, form and pattern as follows:
  - a. Type XX, mineral based with membrane faced overlay. Vinyl face, back and sides covered gypsum ceiling panels.
  - b. Form: Not Applicable
  - c. Pattern: Smooth
3. Color: Flat White 050.
4. LR: Not less than 0.77
5. NRC: Not less than: N/A
6. CAC: Not less than 35
7. Edge / Joint Detail:
  - a. Square (Typical if not indicated on drawings).
  - b. SLT Beveled Reveal (Only if indicated on drawings).
8. Panel Thickness: 1/2 inch (12.7 mm).

9. Modular Size: 24 by 24 inches (610 by 610 mm).
10. Recycled Content: 80%.
11. Panel Features: Washable, scrubbable, soil and impact resistant finish. Meets USDA/FSIS guidelines for use in food processing areas.
12. Clean room performance: Acceptable in applications up to Class 100 Clean rooms.
13. ClimaPlus™ 30 year limited system warranty. Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.
14. Suspension Grid/Width: USG Donn ZXLA; 15/16".

**B. Acoustical Panel Type: Lay-In Acoustical Ceiling Panels**

1. USG "Radar" Acoustical Panels
2. Classification: Provide ceiling panels complying with ASTM E 1264 for type, form and pattern as follows:
  - a. Type III, mineral base with painted finish
  - b. Form: 2, water felted.
  - c. Pattern: Perforated, small holes and light texture.
3. Color: Flat White 050.
4. LR: Not less than 0.84
5. NRC: Not less than 0.45
6. CAC: Not less than 33
7. Edge / Joint Detail:
  - a. SQ Square (Typical if not indicated on drawings).
  - b. SLT Beveled Reveal (Only if indicated on drawings).
8. Panel Thickness: 5/8 inch (15.8mm).
9. Modular Size: 24 by 24 inches (600 by 600 mm).
10. Recycled Content: Up to 59%.
11. Panel Features:
  - a. Biobased product that is USDA certified.
  - b. Abuse Resistant, high durability and can be cleaned easily with a soft brush & vacummed.
12. ClimaPlus™ 30 year limited system warranty. Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.
13. Suspension Grid/Width: USG Donn DX; 15/16" (24mm).

**2.4 GENERAL METAL SUSPENSION SYSTEMS**

- A. Standard for Metal Suspension Systems: Provide metal suspension systems of type, structural classification and finish indicated which comply with applicable STM C 635 requirements.
- B. Finishes and Colors: Provide manufacturer's standard factory applied finish for type of system indicated. For exposed suspension members and accessories with painted finish, provide color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's full range of standard colors.
  1. White.

- C. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung.
- D. Hanger Wire: Galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating, sized so that stress at 3- times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 12 gage.
- E. Edge Moldings and Trim: Formed steel section; exposed surfaces prefinished to match suspension system components.
  - 1. Provide shadow molding for edges equal to MS174; 9/16" thick exposed flange; 3/8" x 3/8" reveal; 7/8" vertical flange.
  - 2. At penetrations of ceiling install manufacturer's standard molding which fits with type of edge detail and suspension system indicated.
  - 3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- F. Hold-Down/Impact Clips: Where indicated provide manufacturer's standard impact clip system design to absorb impact forces against lay-in panels. Install hold down clips at all ceiling panels within 10'-0" of and exterior door.

## **2.5 METAL SUSPENSION SYSTEMS**

### **A. USG Donn Brand ZXLA 15/16" Acoustical Suspension System**

- 1. Double-web design; Intermediate Duty as defined by ASTM C635. Bottom face with 15/16" (24mm) exposed flange with pre-painted aluminum cap; cross tee holes and hanger wire holes at 6 in oc; integral reversible splices, commercial quality pretreated and painted, exposed surfaces prefinished in manufacturer's enhanced corrosion resistant polyester paint finish. Cross tees; roll-formed into double-web design with rectangular bulb; 15/16 (24mm) in exposed flange with pre-painted aluminum cap; Stainless Steel clips clenched to the web Main tees and cross tees shall be positively locked yet shall be removable without the use of tools.
- 2. Structural Classification: Intermediate Duty.
- 3. Tee Profile: 15/16" (24mm) wide.
- 4. Color: White

### **B. USG Donn Brand DX/DXL 15/16" Acoustical Suspension System**

- 1. Narrow Face, Capped, Double Web, Cold Rolled Steel Suspension System: Main and Cross Tees as defined by ASTM C635, commercial quality pretreated and painted hot-dipped galvanized cold-rolled steel, exposed surfaces prefinished in manufacturer's standard corrosion resistant enamel paint finish
- 2. Structural Classification: Intermediate Duty.
- 3. Tee Profile: Narrow Face 15/16" (22mm) wide.
- 4. Color: White

## **2.6 SEALANT**

- A. Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of concealed construction joints.
- B. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. BA-98; Pecora Corp.
  - 2. Tremco Acoustical Sealant; Tremco
  - 3. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to schedule bid opening.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.
  - 1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.
- B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Coordinate ceiling layout with lighting layout. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans.

### **3.2 INSTALLATION**

- A. General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and CISCA standards applicable to work.
- B. Arrange acoustical units and orient directionally-patterned units (if any) in manner shown by reflected ceiling plans.
- C. Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members.
  - 1. Locate hangers within 6" inches from each end and spaced 4'-0" along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8" in 12'-0".
  - 2. Locate hangers on all 4 corners of the ceiling grid where a projector is installed
- D. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperature.
- E. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing, counter-splaying or other equally effective means.
- F. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
- G. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.
- H. Screw-attached moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.
- I. Install acoustical panels in coordination with suspension system with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.
- J. Install hold-down clips on panels, within 10'-0" of exterior door openings, where panels are other than horizontal, and in areas where required by governing regulations or for fire-resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required.

### **3.3 EXTRA STOCK**

- A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
  - 1. Ceiling Tile: Furnish not less than one box for each type, color, pattern and size installed.

## **END OF SECTION**



## **SECTION 09650 - RUBBER BASE**

### **PART 1 - GENERAL**

#### **1.1 DESCRIPTION OF WORK**

- A. Extent of rubber base is shown on drawings and in schedules.

#### **1.2 QUALITY ASSURANCE**

- A. Manufacturer: Provide each type of rubber base as produced by a single manufacturer, including recommended, adhesives.
  - 1. Wherever possible, provide required rubber base produced by a single manufacturer.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit 2 copies of manufacturer's technical data and installation instructions for each type of rubber base.
- B. Samples: Submit, for verification purposes, samples of each type, color, and pattern of rubber base,

#### **1.4 JOB CONDITIONS**

- A. Maintain minimum temperature of 65°F in spaces to receive rubber base for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store rubber base materials in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 55°F in areas where work is completed.
- B. Install after other finishing operations, including painting, have been completed.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. Armstrong World Industries, Inc.
  - 2. Flexco
  - 3. Roppe Corporation
- B. Equal products of other manufacturers may be used in the work provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

#### **2.2 MATERIALS**

- A. Colors and Patterns: As selected by Architect from manufacturer's standards.
- B. Wall Base: Provide rubber base complying with FS SS-W-40, Type II, with matching end stops and pre-formed or molded corner units and as follows:
  - 1. Height: 4"
  - 2. Thickness: 1/8"
  - 3. Style: Standard Top-Set Cove
  - 4. Finish: Matte

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed

corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.

1. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
- B. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.

### **3.2 CLEANING AND PROTECTION**

- A. Remove any excess adhesive or other surface blemishes, using neutral type cleaners as recommended by flooring manufacturer. Protect installed flooring with heavy Kraft paper or other covering.
- B. Finishing: After completion of project and just prior to final inspection of work, thoroughly clean floors and accessories.
- C. Apply polish and buff, with type of polish, number of coats, and buffing procedures in compliance with flooring manufacturer's instructions.

**END OF SECTION**

## **SECTION 096723 – RESINOUS FLOORING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes:
  - 1. High-performance resinous flooring systems.

#### **1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Installer Certificates for Qualification: Signed by manufacturer stating that installers comply with specified requirements.
- C. Material Certificates: For each resinous flooring component, from manufacturer.
- D. Maintenance Data: For maintenance manuals.
- E. Samples: Submit two 6" X 6" samples of each resinous flooring system applied to a rigid backing. Provide sample which is a true representation of proposed field applied finish. Provide sample color and texture for approval from Owner in writing or approved by General Contractor prior to installation.
- F. Product Schedule: For resinous flooring.

#### **1.3 QUALITY ASSURANCE**

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of flooring systems required for this Project.
  - 1. Engage an installer who is approved in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
  - 2. Installer Letter of Qualification: Installer to provide letter stating that they have been in business for at least 5 years and listing 5 projects in the last 2 years of similar scope. For each project provide: project name, location, date of installation, contact information, size of project, and manufacturer of materials with system information.
- B. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.
- C. Pre-installation Conference: Conduct conference at Project site before work and mockups begin.
- D. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Do not cover up mockup area.
  - 1. Apply full-thickness mockups on 16 square foot floor area selected by Architect.
  - 2. Finish surfaces for verification of products, color, texture, and sheen.
  - 3. Simulate finished lighting conditions for Architect's review of mockups.
  - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
  - 5. Mockup shall demonstrate desired slip resistance for review and approval by Owner's representative in writing.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

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Bay Minette, Alabama

RESINOUS FLOORING

## 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application unless manufacturer recommends a longer period.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by:
  - 1. The Sherwin Williams Company, Cleveland, OH. [swflooring@sherwin.com](mailto:swflooring@sherwin.com)
  - 2. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. Resuflor Deco Flake BC, 20-30 mils nominal thickness.**
  - 1. Primer: Resuprime 3579 at 200-300 sq. ft. per gallon.
  - 2. Body Coat: Resuflor 3746 at 200-300 sq. ft. per gallon.
  - 3. Broadcast: Decorative Flakes 6750 or 6755 to excess at 100-200 lbs. per 1,000 sq. ft.
  - 4. Grout Coat: Resuflor 3746 at 160-250 sq. ft. per gallon.
  - 5. Seal Coat: Resutile 4686 at 250-400 sq. ft. per gallon.

### 2.2 MATERIALS

- A. VOC Content of Resinous Flooring: Provide resinous flooring systems, for use inside the weatherproofing system, that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].
  - 1. Resinous Flooring: 100 g/L.

### 2.3 HIGH-PERFORMANCE RESINOUS FLOORING

- A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, high-performance, resin-based, monolithic floor surfacing designed to produce a seamless floor.
- B. System Characteristics:
  - 1. Color and Pattern: As indicated from manufacturers listed above.
  - 2. Slip Resistance: Provide slip resistant finish.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Inspection: Prior to commencing Work, thoroughly examine all underlying and adjoining work, surfaces and conditions upon which Work is in any way dependent for perfect results. Report all conditions which affect Work. No "waiver of responsibility" for incomplete, inadequate or defective underlaying and adjoining work, surfaces and conditions will be considered, unless notice of such unsatisfactory conditions has been filed and agreed to in writing before Work begins. Commencement of Work constitutes acceptance of surfaces.

Additions to Elberta High School  
For the Baldwin County Board  
Of Education  
Bay Minette, Alabama

RESINOUS FLOORING

- B. Surface Preparation: Remove all surface contamination, loose or weakly adherent particles, laitance, grease, oil, curing compounds, paint, dust and debris by blast track method or approved mechanical means (acid etch not allowed). If surface is questionable, try a test patch. Create a minimum surface profile for the system specified in accordance with the methods described in ICRI No. 03732 to achieve profile numbers as follows:
  
- C.
  - 1. **Thin film, to 10 mils** **CSP-1 to CSP-3**
  - 2. Thin and medium films, 10 to 40 mils CSP-3 to CSP-5
  - 3. Self-leveling mortars, to 3/16" CSP-4 to CSP-6
  - 4. Mortars and laminates, to 1/4" or more CSP-5 to CSP-10
- D. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
  - 1. Moisture Testing: Perform tests indicated below.
    - a. Calcium Chloride Test: Perform anhydrous calcium chloride test per ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lbs. of water/1000 sq. ft. in 24 hours. Perform tests so that each test area does not exceed 1000 sq. ft. and perform 3 tests for the first 1000 sq. ft. and one additional test for every additional 1000 sq. ft.
    - b. In-Situ Probe Test: Perform relative-humidity test using in-situ probes per ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative-humidity-level measurement.

### 3.2 ENVIRONMENTAL CONDITIONS

- A. All applicators and all other personnel in the area of the RF installation shall take all required and necessary safety precautions. All manufacturers' installation instructions shall be implicitly instructions shall be implicitly followed.
- B. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
- C. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- D. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.
- E. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
- F. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

### 3.3 APPLICATIONS

- A. Install resinous floor over properly prepared concrete surface in strict accordance with the manufacturer's directions.
  - 1. Install the primer and/or base coats over thoroughly cleaned and prepared concrete.
  - 2. Install topcoat over flooring after excess aggregate has been removed.
  - 3. Maintain a slab temperature of 60°F to 80°F for 24 hours minimum before applying floor topping, or as instructed by manufacturer.
- B. Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
  2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
  3. At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
- C. Sealant: Saw cut resinous floor topping at expansion joints in concrete slab. Fill sawcuts with sealant prior to final seal coat application. Follow manufacturer's written recommendations.
- D. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- E. Slip Resistant Finish: Provide grit for slip resistance.
- F. Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

### 3.4 COMPLETED WORK

- A. Cleaning: Upon completion of the Work, clean up and remove from the premises surplus materials, tools, appliances, empty cans, cartons and rubbish resulting from the Work. Clean off all spattering and drippings, and all resulting stains.
- B. Protection: Protect Work in accordance with manufacturer's directions from damage and wear during the remainder of the construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.
- C. Contractor shall insure that coating is protected from any traffic until it is fully cured to the satisfaction of the coating manufacturer.

END OF SECTION 096723

## SECTION 09900 - PAINTING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. Extent of painting work is indicated on drawings and schedules, and as herein specified including accent painting.
- B. Work includes painting and finishing of interior and exterior exposed items and surfaces throughout project, except as otherwise indicated.
  - 1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatments specified under other sections of work.
- C. Work includes field painting of exposed bare and covered pipes, conduits and ducts (including color coding), and of hangers, exposed steel and iron work, and conduits and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated.
- D. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- E. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these from standard colors or finishes available.
- F. Following categories of work are not included as part of field-applied finish work.
  - 1. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) metal toilet enclosures, prefinished partition systems, acoustic materials, elevator entrance doors and frames, elevator equipment, and finished mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.
  - 2. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
  - 3. Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.
  - 4. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.
- G. Following categories of work are included under other sections of these specifications.
  - 1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work and similar items.
  - 2. Unless otherwise specified, shop priming of fabricated components such as shop-fabricated or factory-built mechanical and electrical equipment or accessories is included under other sections of these specifications.
- H. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

### **1.3 QUALITY ASSURANCE**

- A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer and use only within recommended limits.
- B. Coordination of Work: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
- B. Samples: Prior to beginning work, Architect will furnish color chips for surfaces to be painted. Use representative colors when preparing samples for review. Submit samples for Architect's review of color and texture only.
- C. Provide a listing of material and application for each coat of each finish sample. Provide a 4' x 4' sample application of each color paint for Architect's approval prior to final ordering of product. Sample application shall be applied in an inconspicuous place, satisfactory to the Architect.

### **1.5 DELIVERY AND STORAGE**

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
  - 1. Name or title of material.
  - 2. Fed. Spec. number, if applicable.
  - 3. Manufacturer's stock number and date of manufacturer.
  - 4. Manufacturer's name.
  - 5. Contents by volume, for major pigment and vehicle constituents.
  - 6. Thinning instructions.
  - 7. Application instructions.
  - 8. Color name and number.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
  - 1. Protect from freezing where necessary. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all precautions to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

### **1.6 JOB CONDITIONS**

- A. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degree F and 90 degrees F, unless otherwise permitted by paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degree F and 95 degree F, unless otherwise permitted by paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85% or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
  - 1. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.



## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. The following manufacturers are listed as acceptable substitutions to the establish minimum standards. Sherwin Williams Products are listed as the standard of product performance and quality.
  - 1. Sherwin Williams Paint Company (SW)
  - 2. Benjamin Moore and Co. (Moore).
  - 3. Pittsburgh Paints (PPG).
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

### **2.2 MATERIALS**

- A. Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.
  - 1. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.
  - 2. Federal Specifications establish minimum acceptable quality for paint materials. Provide written certification from paint manufacturer that materials provided meet or exceed these minimums.
  - 3. Manufacturer's products which comply with coating qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to Architect. Furnish material data and manufacturer's certificate of performance to Architect for any proposed substitutions.
- B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

## **PART 3 – EXECUTION**

### **3.1 INSPECTION**

- A. **Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator. If work is begun before satisfactory conditions are met, then it shall be the Applicators' responsibility for the finish surfaces conditions.**
- B. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

### **3.2 SURFACE PREPARATION**

- A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
  - 1. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
  - 2. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.

3. Contractor MUST remove ALL foreign matter/material not pertinent to new paint from all surfaces before application of any new paint. Foreign matter/material includes, but is not limited to, flaking paint, tape, tacks, nails, poster gum, adhesives of any kind etc.
  4. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.
- B. Cementitious Materials: Prepare cementitious surfaces of concrete, concrete block, cement plaster and cement-asbestos board to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.
1. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
  2. Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner. Flush floor with clean water to neutralize acid and allow to dry before painting.
- C. Wood: Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
1. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, paneling.
  2. When transparent finish is required, use spar varnish for backpriming.
  3. Backprime all exposed exterior wood. Backprime paneling on interior partitions only where masonry, plaster, or other wet wall construction occurs on backside.
  4. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.
- D. Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
1. Touch-up shop-applied prime coats wherever damaged or bare. Clean and touch-up with same type shop primer.
- E. Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent.

### **3.3 MATERIALS PREPARATION**

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density and stir as required during application. Do not stir surface film into material. If film exists, remove film and strain paint material.

### **3.4 APPLICATION**

- A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied. Paint colors, surface treatments, and finishes, are indicated in "schedules" of the contract documents.
  1. Provide finish coats which are compatible with prime paints used.

2. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness not less than specified thickness.
  3. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
  4. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
  5. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
  6. Finish exterior doors on tops, bottoms and side edges same as exterior faces, unless otherwise indicated.
  7. Sand lightly between each succeeding enamel or varnish coat.
  8. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.
- B. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss adhesion of the undercoat.
- C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.
- D. Prime Coats: Apply prime coat where required to be painted or finished, and which has not been primed coated by others.
1. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- E. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.
- F. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
1. Provide satin finish for final coats, unless otherwise indicated.
- G. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

### **3.5 FIELD QUALITY CONTROL**

- A. The right is reserved by Owner to invoke the following material testing procedure at any time, and any number of times during period of field painting:
1. Engage services of an independent testing laboratory to sample paint being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
  2. Testing laboratory will perform appropriate tests for any or all of following characteristics: Abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated

weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance and quantitative materials analysis.

- B. If test results show that material being used does not comply with specified requirements, Contractor may be directed to stop painting work, and remove non-complying paint; pay for testing; repaint surfaces coated with rejected paint; remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are non-compatible.

### **3.6 CLEAN-UP AND PROTECTION**

- A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each day.
- B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
  - 1. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- D. At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

### **3.7 EXTRA STOCK**

- A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
  - 1. Paint: Furnish not less than one gallon for each type and color, applied.

### **3.8 EXTERIOR PAINT SCHEDULE**

#### **A. GENERAL**

- 1. Paint all new roof penetrations at roof areas, including roof attic ventilators and exhaust fan housings.
- 2. General: Provide the following paint systems for the various substrates, as indicated.

#### **B. EXTERIOR METALS**

- 1. Zinc-Coated Metal.
  - a. Alkyd Gloss Enamel Finish.
    - i. 2 Coats over primer, with total dry film thickness not less than 2.5 mils.
    - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
    - iii. 2nd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series.
    - iv. 3rd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series, (2-4 mils dry per coat).
  - b. (*Contractor Option*) Waterbased Alkyd Gloss Enamel Finish.
    - i. 2 Coats over primer, with total dry film thickness not less than 2.5 mils.
    - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
    - iii. 2nd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series.

- iv. 3rd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series, (1.4 – 1.7 mils dry per coat).
- 2. Ferrous Metal.
  - a. Alkyd Gloss Enamel Finish.
    - i. 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils.
    - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
    - iii. 2nd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series.
    - iv. 3rd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series, (2-4 mils dry per coat).
  - b. (*Contractor Option*) Waterbased Alkyd Gloss Enamel Finish.
    - i. 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils.
    - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
    - iii. 2nd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series.
    - iv. 3rd Coat: S-W Pro Industrial Water-based Alkyd Urethane Enamel, Gloss Finish, B53 Series, (1.4 – 1.7 mils dry per coat).

### C. EXTERIOR WOODWORK

- 1. Painted Woodwork.
  - a. Exterior Acrylic Latex Gloss Finish.
    - i. 2 finish coats over primer with total dry film thickness of not less than 5.0 mils. Back prime all trim.
    - ii. 1st Coat: S-W Exterior Oil-Based Wood Primer, Y24W08020 (4 mils wet, 2.2 mils dry).
    - iii. 2nd Coat: S-W SuperPaint Exterior Latex Gloss Paint, A84 Series.
    - iv. 3rd Coat: S-W SuperPaint Exterior Latex Gloss Paint, A84 Series (4 mils wet, 1.5 mils dry per coat).
- 2. Stained Woodwork.
  - a. Acrylic Solid Color Stain.
    - i. Stained Finish: 2 Coats of stain on open grain wood.
    - ii. 1st Coat: S-W Woodscapes Exterior Acrylic Solid Color Stain (200-400 sq ft/gal) @ 4-8 mils wet; 1.3-2.6 mils dry.
    - iii. 2nd Coat: S-W Woodscapes Exterior Acrylic Solid Color Stain (200-400 sq ft/gal) @ 4-8 mils wet; 1.3-2.6 mils dry.

### D. EXTERIOR MASONRY UNITS

- 1. Concrete / Mortar Surfaces (Pre-cast, Cast-In-Place, EIFS, Stucco, etc).
  - a. Acrylic Coating.
    - i. 1st Coat: S-W Loxon Concrete & Masonry Primer / Sealer, LX02W0050 (5.3 – 8.0 mils wet, 2.1 – 3.2 mils dry per coat).
    - ii. 2nd Coat: S-W Loxon Self-Cleaning Acrylic Coating, LX13 Series.
    - iii. 3rd Coat: S-W Loxon Self-Cleaning Acrylic Coating, LX13 Series (5.0 – 7.0 mils wet, 2.1 – 2.9 mils dry per coat).

2. Concrete Masonry Units (CMU).
  - a. Acrylic Coating.
    - i. 1st Coat: S-W Pro Industrial Heavy Duty Block Filler, B42W00150 (16.0 – 21.0 mils wet, 8.0 - 10.5 mils dry per coat).
    - ii. 2nd Coat: S-W Loxon Self-Cleaning Acrylic Coating, LX13 Series.
    - iii. 3rd Coat: S-W Loxon Self-Cleaning Acrylic Coating, LX13 Series (5.0 – 7.0 mils wet, 2.1 – 2.9 mils dry per coat).

### 3.9 INTERIOR PAINT SCHEDULE

#### A. GENERAL

1. Provide the following paint systems for the various substrates, as indicated on drawings, schedules and specifications.
2. Paint all exposed metals (steel framing, mechanical ducts, conduit, etc.) unless otherwise indicated on drawings.
3. Painter shall identify all fire and smoke partitions above lay in ceilings as follows: Wording shall be "FIRE AND SMOKE BARRIERS - PROTECT ALL OPENINGS" (4" high), to be applied every 8'- 0" on center.

#### B. INTERIOR METALS

1. Structural Steel / Metal Building Components.
  - a. Epoxy Egshel Finish.
    - i. 2 coats over primer with total dry film thickness not less than 6.0 mils.
    - ii. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66W01310 (5 – 10 mils wet, 1.9 – 3.8 mils dry per coat).
    - iii. 2nd Coat: S-W Pro Industrial Waterbased Catalyzed Epoxy EgShel Finish, B73-360 Series (5.0 – 12.0 mils wet, 2.0 – 5.0 mils dry per coat).
    - iv. 3rd Coat: S-W Pro Industrial Waterbased Catalyzed Epoxy EgShel Finish, B73-360 Series (5.0 – 12.0 mils wet, 2.0 – 5.0 mils dry per coat).
2. Zinc-Coated Metal
  - a. Alkyd Gloss Enamel Finish.
    - i. 2 Coats over primer, with total dry film thickness not less than 6.0 mils.
    - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat) .
    - iii. 2nd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series.
    - iv. 3rd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series, (2-4 mils dry per coat).
  - b. *(Contractor Option)* Waterbased Alkyd Gloss Enamel Finish.
    - i. 2 Coats over primer, with total dry film thickness not less than 6.0 mils.
    - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
    - iii. 2nd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series.
    - iv. 3rd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series, (1.4 – 1.7 mils dry per coat).

### 3. Ferrous Metal

- a. Alkyd Gloss Enamel Finish.
  - i. 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils.
  - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
  - iii. 2nd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series.
  - iv. 3rd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series, (2-4 mils dry per coat).
- b. *(Contractor Option)* Waterbased Alkyd Gloss Enamel Finish..
  - i. 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils.
  - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
  - iii. 2nd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series.
  - iv. 3rd Coat: S-W Pro Industrial Water-based Alkyd Urethane Enamel, Gloss Finish, B53 Series, (1.4 – 1.7 mils dry per coat).

### C. INTERIOR MASONRY UNITS

#### 1. Concrete Masonry Units (CMU).

- a. Latex Semi-Gloss Enamel Finish
  - i. 2 Finish coats over filled surface with total dry film thickness of not less than 11.4 mils.
  - ii. 1st Coat: S-W Pro Industrial Heavy Duty Block Filler, B42W00150 (16.0 – 21.0 mils wet, 8.0 - 10.5 mils dry per coat).
  - iii. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series.
  - iv. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series (4 mils wet, 1.5 mils dry per coat).
  - v. Locations: Typical at all CMU unless otherwise indicated in the schedule.
- b. Epoxy - Pre-Catalyzed Waterbased Semi-Gloss Finish.
  - i. 2 Finish coats over filled surface with total dry film thickness of not less than 11.4 mils.
  - ii. 1st Coat: S-W Pro Industrial Heavy Duty Block Filler, B42W00150 (16.0 – 21.0 mils wet, 8.0 - 10.5 mils dry per coat).
  - iii. 2nd Coat: S-W Pro Industrial® Pre-Catalyzed Waterbased Epoxy Semi-Gloss, K46-01151 Series (4 mils wet, 1.4 mils dry per coat).
  - iv. 3rd Coat: S-W Pro Industrial® Pre-Catalyzed Waterbased Epoxy Semi-Gloss, K46-01151 Series (4 mils wet, 1.4 mils dry per coat).
  - v. Locations: All Wet Areas in Athletic Facilities.
- c. Epoxy – Catalyzed Waterbased EgShel Finish.
  - i. 2 Finish coats over filled surface with total dry film thickness not less than 14.0 mils.
  - ii. 1st Coat: S-W Pro Industrial Heavy Duty Block Filler, B42W00150 (16.0 – 21.0 mils wet, 8.0 - 10.5 mils dry per coat).
  - iii. 2nd Coat: S-W Pro Industrial Catalyzed Waterbased Epoxy EgShel Finish, B73-360 Series.
  - iv. 3rd Coat: S-W Pro Industrial Catalyzed Waterbased Epoxy EgShel Finish, B73-360 Series (5.0 – 12.0 mils wet, 2.0 – 5.0 mils dry per coat).

- v. Locations:
  - 1. All Showers Areas.
  - 2. Kitchens / Cafeterias / Servicing / Dining / Kitchen Storage / Dishwashing / Freezer-Coolers.
  - 3. FACS.
- 2. Existing Concrete Masonry Units (CMU).
  - a. If existing concrete block walls are covered with an enamel paint finish, the following shall be used:
    - i. 1st Coat: S-W Extreme Bond Primer, B51W00150 (3.1 mils wet, .9 mils dry).
    - ii. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series.
    - iii. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series (4 mils wet, 1.5 mils dry per coat) .
  - b. If the existing concrete block walls are covered with a latex paint finish, the following shall be used:
    - i. 1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).
    - ii. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series.
    - iii. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series (4 mils wet, 1.5 mils dry per coat).

#### **D. GYPSUM DRYALL**

- 1. Walls and Ceilings
  - a. Interior Acrylic Latex Semi-Gloss Finish.
    - i. 3 Coat system with dry film thickness not less than 3.8 mils.
    - ii. 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).
    - iii. 2nd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss Finish, B31W02651 Series.
    - iv. 3rd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss Finish, B31W02651 Series (4 mils wet, 1.5 mils dry per coat).
    - v. Locations: Typical at all Gypsum Drywall Walls and Ceilings unless otherwise indicated in the schedule.
  - b. Epoxy - Pre-Catalyzed Waterbased EgShel Finish.
    - i. 2 Finish coats over Primer with total dry film thickness not less than 14.0 mils.
    - ii. 1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).
    - iii. 2nd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy EgShel Finish, K45-01151.
    - iv. 3rd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy EgShel Finish, K45-01151 (2-4 mils dry per coat).
    - v. Locations: Walls and Ceilings at Showers Areas. *NOT in Shower Stalls.*
  - c. *(Contractor Option)* Epoxy - Catalyzed Waterbased EgShel Finish.
    - i. 2 Finish coats over Primer with total dry film thickness not less than 14.0 mils.
    - ii. 1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).



- iii. 2nd Coat: S-W Pro Industrial Catalyzed Waterbased Epoxy EgShel Finish, B73-360 Series.
- iv. 3rd Coat: S-W Pro Industrial Catalyzed Waterbased Epoxy EgShel Finish, B73-360 Series (5.0 – 12.0 mils wet, 2.0 – 5.0 mils dry per coat).
- v. Locations: Walls and Ceilings at Showers Areas. *NOT in Shower Stalls.*

## **E. INTERIOR WOODWORK**

- 1. Painted Woodwork.
  - a. Interior Semi-Gloss Acrylic Latex with dry film thickness not less than 3.8 mils.
    - i. 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).
    - ii. 2nd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss Finish, B31W02651 Series.
    - iii. 3rd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss Finish, B31W02651 Series (4 mils wet, 1.5 mils dry per coat).
- 2. Stained Woodwork
  - a. Stained Varnish Rubbed Finish: 3 Finish Coats over stain plus filler on open grain wood.
    - i. 1st Coat: S-W MinWax Performance Series Tintable Interior Stain 550 VOC, (450-550 sq ft/gal) Available in 250 VOC Version.
    - ii. 2nd Coat: S-W MinWax Performance Series Fast-Dry Varnish.
    - iii. 3rd Coat: S-W MinWax Performance Series Fast-Dry Varnish (600-700 sq ft/gal) (available in Gloss, Semi-Gloss, Satin)
- 3. Wall Panels (Wood and Acoustical).
  - a. Interior Semi-Gloss Finish Acrylic Latex with dry film thickness not less than 3.8 mils.
    - i. 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600(4 mils wet, 1.0 mils dry)
    - ii. 2nd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651 Series
    - iii. 3rd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651 Series (4 mils wet, 1.5 mils dry per coat)

**END OF SECTION**

## **SECTION 10160 - TOILET PARTITIONS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Extent of toilet partitions is indicated on drawings.
- B. Types of toilet partitions and screens required include the following:
  - 1. Solid phenolic with fused surface laminate, floor-supported, overhead-braced.
- C. Toilet accessories are specified elsewhere in Division 10.

#### **1.3 QUALITY ASSURANCE**

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay work.
- B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.
- C. Samples: Submit full range of color samples for each type of unit required. Submit 6" square samples of each color and finish on same substrate to be used in work, for color selections.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. Bobrick Washroom Equipment, Inc, 200 Commerce Drive, Clifton Park NY 12065-1350; Ph.: 518.877.7444; [www.bobrick.com](http://www.bobrick.com).
  - 2. General Partitions Mfg. Corp., 1702 Peninsula Drive, Erie, PA 16505-4243; Ph.: 814.833.1154; [www.generalpartitions.com](http://www.generalpartitions.com).
  - 3. ASI Global Partitions; 900 Clary Connector, Eastonollee, GA 30538; Ph.: 706.827.2700; [www.asi-globalpartitions.com](http://www.asi-globalpartitions.com).
  - 4. ASI Accurate Partitions; 160 Tower Drive; Burr Ridge, IL 60527; Phone: 708.442.6800; [www.asi-accuratepartitions.com](http://www.asi-accuratepartitions.com).
  - 5. Bradley Partitions; W142N9101 Fountain Boulevard, Menomonee Falls, WI 53051; Ph.: 1.800.272.3539; [www.bradleycorp.com](http://www.bradleycorp.com).
  - 6. PSiSC - A Division of CSiSC; 9031 Farrow Road, Columbia, SC 29203; Ph.: 803.252.3020 Extension 106; [www.psisc.com](http://www.psisc.com).
  - 7. Metpar; 95 State Street, Westbury, NY 11590; Ph: 516.333.2600; [www.metpar.com](http://www.metpar.com).
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

## 2.2 MATERIALS

- A. General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are not acceptable.
- B. Materials: Doors, panels and pilasters are composed of compressed cellulose fibers impregnated with resins. The surface laminate is fused to the resin-impregnated core. All edges are machined and finished smooth with beveled edge. Material will not delaminate even under extreme conditions. Materials are non-absorbent, impact and graffiti resistant. Materials are impervious to steam, soaps and detergents and will not mildew.
- C. Panels: Shall be 1/2" thick with eased edges uniformly machined to a 1/16" radius. Panels are 58" high and anchored to walls with 18 gauge stainless steel continuous brackets and continuous stainless steel brackets at panel to pilaster locations.
- D. Doors: Shall be 3/4" thick with eased edges uniformly machined to a 1/16" radius. Doors are 58" high and mounted to pilasters with continuous stainless steel surface mounted hinge. Pre-threaded inserts are to be provided for all door hardware. Each door is furnished with one coat hook/bumper, slide latches, stops and pulls (for outswing doors) to be made of stainless steel. Door hardware shall allow for lift up emergency access.
- E. Pilasters: Shall be 3/4" thick with eased edges uniformly machined to a 1/16" radius. Pilasters are 83" high (or as indicated on the drawings) and anchored to panels and walls with continuous stainless steel brackets. The pilasters contain no less than two level adjusting bolts on the bottom and attach to the floor with two 3/4" expansion bolts and are braced at the top with aluminum headrail.
- F. Stainless Steel Pilaster Shoes: Shall be 3" high, and constructed of 20-gauge stainless steel. Pilaster shoes are bolted onto pilaster with stainless steel, tamper resistant sex bolts and screws.
- G. Latches and Keepers: Shall be fabricated from stainless steel with a satin finish. Latch is mounted onto door with 1/4" stainless steel torx head bolts pre-threaded inserts and acts as the stop for inswing doors. Keepers are mounted on the pilasters with stainless steel toex head screws.
- H. Headrail: Shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with bright-dip anodized finish. Headrail is anti-grip and attaches to the top of the pilasters with stainless steel, tamper resistant torx screws. Headrail is attached to the adjacent wall construction with a stainless steel headrail bracket.
- I. Headrail Bracket: Shall be made of 16 gauge stainless steel and is attached to the adjacent wall construction with #14 x 1 1/2" stainless steel phillips-head screws and plastic anchors.
- J. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel with pinhead, torx screws and bolts.

## 2.3 FABRICATION

- A. General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.
- B. Door Dimensions: Unless otherwise indicated, furnish 24" wide inswinging doors for ordinary toilet stalls and 32" wide (clear opening) outswinging doors at stalls equipped for use by handicapped.
- C. Overhead-Braced Partitions: Furnish stainless steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous aluminum overhead-bracing tube at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
- D. Floor-Supported Partitions: furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters, to permit structural connection at floor. Furnish shoe at each pilaster to conceal anchorage.

- E. Floor-Supported Over-Head Braced Screens: Furnish pilasters not less than 3/4" in thickness, panels and pilasters of same construction and finish as toilet partitions. Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjusting nuts at pilasters, to permit structural connection to floor. Furnish shoe at pilaster to conceal anchorage.
- F. Accessories: Furnish units with chromium-plated finish, unless otherwise indicated.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. General: Comply with manufacturer's recommended procedures and installation sequences. Install partitions rigid, straight, plumb, and level.
- B. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with full length stainless steel brackets. Secure panels to pilasters with not less than two stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.
- C. Overhead-Braced Partitions and Screens: Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead-brace to each pilaster with not less than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead-brace when doors are in closed position.
- D. Floor-Supported Partitions: Set pilaster units with anchorages having not less than 2" penetration into structural floor, unless otherwise recommended by partition manufacturer. Level, plumb and tighten installation with devices furnished. Hang doors and adjust so that tops of doors are level with tops partition when doors are in closed position.
- E. Screens: Attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.
- F. Accessories: Mount accessories to partition units in accordance with manufacturer's instructions.

#### **3.2 ADJUST AND CLEAN**

- A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors (and entrance swing doors) to return to fully closed position.
- B. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer and provide protection as necessary to prevent damage during remainder of construction period.

### **END OF SECTION**

## **SECTION 10200 - LOUVERS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK:**

- A. Extent of louvers and vents is indicated on drawings, including indications of sizes and locations.
  - 1. Fixed Wall Louvers.

#### **1.3 DEFINITIONS**

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades; i.e., the axes of the blades are horizontal.
- C. Vertical Louver: Louver with vertical blades; i.e., the axes of the blades are vertical.
- D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.
- E. Rain-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

#### **1.4 SUBMITTALS**

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets for each product and assembly specified.
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Cleaning methods.
- C. Shop Drawings: For units and accessories. Include plans; elevations; sections; and details showing profiles, angles, and spacing of elements. Show unit dimensions related to wall openings and adjacent construction; free area for each size indicated for louvers; profiles of frames at jambs, heads, and sills; and anchorage details and locations.
  - 1. Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.
  - 2. For installed products indicated to comply with design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Product Certificates:
  - 1. Air Performance: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500 and are licensed to bear the AMCA Certified Ratings Seal in accordance with AMCA Standard 511.
  - 2. Water Penetration: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500 and are licensed to bear the AMCA Certified Ratings Seal in accordance with AMCA Standard 511.
  - 3. Weather Louver Effectiveness: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500-L99, Section 8.3.2 - Wind Driven Rain Water Penetration Test, and are licensed to bear the AMCA Certified Ratings Seal in accordance

with AMCA Standard 511.

4. Provide AMCA Certification - Water, Air for louvers as scheduled.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Selection Samples: Two complete color charts showing the full range of colors available for units with factory-applied color finishes.
- G. Samples for Verification: For each finish specified, two samples representing actual finishes specified; prepared on Samples of same thickness and material indicated for final Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

## **1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Minimum 5 years manufacturing similar products. The manufacturer shall have implemented a program for the management of quality objectives, continual improvement, and monitoring of customer satisfaction to assure that customer needs and expectations are met.
- B. Installer Qualifications: Minimum 2 years experience installing similar louvers.
- C. Professional Engineer Qualifications: A professional engineer legally qualified to practice in jurisdiction where Project is located and experienced in providing engineering services of kind indicated. Engineering services are defined as those performed for installations of products that are similar to those indicated for this Project in material, design, and extent.
- D. Source Limitations: Obtain products through one source from a single manufacturer where alike in one or more respects regarding type, design, or factory-applied color finish.
- E. Welding Standards: As follows:
  1. Comply with AWS D1.2, "Structural Welding Code - Aluminum."
  2. Comply with AWS D1.3, "Structural Welding Code - Sheet Steel."
- F. AMCA Standard 500-L: Air performance, water penetration and air leakage ratings shall be determined in accordance with Air Movement and Control Association International Inc (AMCA) Standard 500, "Laboratory Methods of Testing Louvers for Rating."
- G. SMACNA Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" recommendations for fabrication, construction details, and installation procedures.

## **1.6 SEQUENCING AND SCHEDULING**

- A. Field Measurements: Verify openings and adjacent construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to established dimensions.
  2. Coordinate Setting Drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

## **1.7 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

## 1.8 WARRANTY

- A. Manufacturer shall provide standard limited warranty for louver systems for a period of five years (60 months) from date of installation, no more than 60 months after shipment from manufacturing plant. When notified in writing from the Owner of a manufacturing defect, manufacturer shall promptly correct deficiencies without direct financial cost to the Owner.
- B. Manufacturer shall provide 20 year limited warranty for fluoropolymer-based finish on extruded aluminum substrates.
  - 1. Finish coating shall not peel, blister, chip, crack or check.
  - 2. Chalking, fading or erosion of finish when measured by the following tests:
    - a. Finish coating shall not chalk in excess of 8 numerical ratings when measured in accordance with ASTM D4214.
    - b. Finish coating shall not change color or fade in excess of 5 NBS units as determined by ASTM D2244 and ASTM D822.
    - c. Finish coating shall not erode at a rate in excess of 10%/ 5 year as determined by Florida test sample.
- C. Manufacturer shall provide a 5 year limited warranty for Class I and a 3 year limited warranty for Class II anodized finish on extruded aluminum substrates.
  - 1. Seller warrants the Finish under normal atmospheric conditions.
    - a. Will not crack, craze, flake or blister
    - b. Will not change or fade more than (5) Delta-E Hunter units as determined by ASTM method D-2244
    - c. Will not chalk in excess of ASTM D-4214-07 number (8) rating, determined by the procedure outlined in ASTM D-4214-07 specification test.
  - 2. Any forming or welding must be done prior to finishing. Post forming or welding will void the warranty.
  - 3. This Warranty applies only if the anodized aluminum product is installed in strict accordance with Seller's recommended practices and maintained in accordance with AAMA (American Architectural Manufacturers Association) publication number 609 and 610-09 ("Cleaning and Maintenance Guide for Architecturally Finished Aluminum").

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to established minimum standards for materials, workmanship and functions:
  - 1. Reliable Architectural Products (Basis of Design) | 1300 Enterprise Road, Geneva, Alabama 36340 | PH: 334.684.3621 or 800.624.3914 | [www.reliablelouvers.com](http://www.reliablelouvers.com).
  - 2. Ruskin Company | 3900 Dr. Greaves Rd. Grandview, MO 64030 | PH: 816.761.7476 | [www.ruskin.com](http://www.ruskin.com).
  - 3. The Airolite Company, LLC. | Ph: 715.841.8757 | [www.airolite.com](http://www.airolite.com).
  - 4. Air Performance Louvers LLC. | 159 Genco Drive, Hartford, AL 36344 | Ph: 334.588.0191 or 588.0070 | [www.airperformancellc.com](http://www.airperformancellc.com).
  - 5. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect not less than Ten (10) days prior to scheduled bid opening.

### 2.2 STATIONARY BLADE LOUVER

- A. Model 4375Z125 as manufactured by Reliable Louver Company
- B. Fabrication:

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

LOUVERS  
10200-3

1. Design: Stationary non- drainable louver with drain gutters in head frame with downspouts in the jambs and mullions with all welded construction. Hidden vertical supports to allow unlimited continuous line appearance. Steeply angled integral sill.
2. Frame:
  - a. Frame Depth: 4 inches (102 mm).
  - b. Wall Thickness: .081 inch (2.1 mm) nominal.
  - c. Material: Extruded aluminum, Alloy 6063-T6.
3. Blades:
 

Style: Non- Drainable: 37.5 degrees at 5-3/32 inches (129 mm)

  - a. Wall Thickness: 0.081 inch (2.1 mm), nominal.
  - b. Material: Extruded aluminum, Alloy 6063 T6.
4. Minimum Assembly Size: 12 inches wide by 12 inches high (305 mm x 305 mm).
5. Maximum Factory Assembly Size: Single sections shall not exceed 120 inches wide by 90 inches high (3048 mm x 2286 mm) or 90 inches wide by 120 inches high (2286 mm x 3048). Louvers larger than the maximum single size shall be require field assembly of smaller sections.
6. Recycled Content: 18% post-consumer. 55% pre-consumer, post-industrial, total 73% by weight.

C. Performance Data:

1. Based on testing 48 inch x 48 inch (1,219 mm x 1,219 mm) size unit in accordance with AMCA 500.
2. Free Area: 54 percent, nominal.
3. Free Area Size: 8.58 square feet (0.79 m<sup>2</sup>).
4. Maximum Recommended Air Flow through Free Area: 803 feet per minute (4.08 m/s).
5. Air Flow: 6890 cubic feet per minute (3.25 m<sup>3</sup>/s).
6. Maximum Pressure Drop (Intake): 0.15 inches w.g. (0.035 kPa).
7. Water Penetration: Maximum of 0.01 ounces per square foot (3.1 g/m<sup>2</sup>) of free area at an air flow of 803 feet per minute (4.08 m/s) free area velocity when tested for 15 minutes.

D. Design Windload: Per Code.

E. Louvers shall be factory engineered to withstand the specified seismic loads.

1. Minimum design loads shall be calculated to comply with ASCE – 7, or local requirements of Authority Having Jurisdiction (AHJ).

## 2.3 ACCESSORIES

- A. Bird Screen: Install insect screens on intake louvers and bird screens on exhaust louvers. Do not install insect screens on HVAC intake louvers.
  1. Aluminum: Aluminum, 5/8 inches by 0.040 inch (16 mm by 1 mm), expanded and flattened.
  2. Frame: Removable. Re-wireable.
- B. Insect Screens: Install insect screens on intake louvers and bird screens on exhaust louvers. Do not install insect screens on HVAC intake louvers.
  1. Aluminum: 18-16 mesh, mill finish, .011 inch (0.3 mm) wire.
  2. Frame: Aluminum.
- C. Extended Sills:
  1. Extruded aluminum, Alloy 6063-T6. Minimum nominal thickness 0.060 inch (1.5 mm).



2. Formed aluminum, Alloy 3003. Minimum nominal thickness 0.081 inch (2.1 mm).
- D. Visible Mullions: Manufacturer's standard horizontal or vertical visible mullions for architectural accent as indicated on drawings.

## **2.4 FINISHES**

- A. Finish: 70 percent PVDF: Finish shall be applied at 1.2 mil total dry film thickness.
1. Coating shall conform to AAMA 2605. Apply coating following cleaning and pretreatment. Cleaning: AA-C12C42R1X.
    - a. Standard 2-coat.
  2. 20-year finish warranty.
- B. Color: Color to be selected by Architect.

## **2.5 MATERIALS, GENERAL**

- A. Fastenings: Use same material as items fastened, unless otherwise indicated. Fasteners for exterior applications may be hot-dip galvanized, stainless steel or aluminum. Provide types, gages and lengths to suit unit installation conditions. Use Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
- B. Anchors and Inserts: Use metal anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required.
- C. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).

## **2.6 FABRICATION, GENERAL**

- A. Provide louvers and accessories of design, materials, sizes, depth, arrangement, and metal thicknesses indicated, or if not indicated, as required for optimum performance with respect to airflow; water penetration; air leakage where applicable (for adjustable units, if any); strength; durability; and uniform appearance.
- B. Fabricate frames including integral sills to suit adjacent construction with tolerances for installation, including application of sealants in joints between louvers and adjoining work.
- C. Include supports, anchorages, and accessories required for complete assembly.
- D. Provide sill extensions and loose sills made of same material as louvers, where indicated, or required for drainage to exterior and to prevent water penetrating to interior.
- E. Maintain equal blade spacing, including separation between blades and frames at head and sill to produce uniform appearance.

# **PART 3 - EXECUTION**

## **3.1 EXAMINATION AND PREPARATION**

- A. Prepare substrates and openings using methods recommended by manufacturer for achieving best result for substrates under project conditions.
- B. Do not proceed with installation until substrates and nailers have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

## **3.2 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
1. Locate and place units level, plumb, and at indicated alignment with adjacent work.
  2. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws

where required to protect metal surfaces and to make a weathertight connection.

3. Form closely fitted joints with exposed connections accurately located and secured.
  4. Provide perimeter reveals and openings of uniform width for sealants and joint fillers as indicated on Drawings.
  5. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
  6. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- B. Install concealed gaskets, flashings, joint fillers, and insulation, as installation progresses, where weathertight joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during installation.

### **3.3 ADJUSTING, CLEANING AND PROTECTION**

- A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.
- B. Protect products from damage until completion of project. Use temporary protective coverings where needed and approved by manufacturer. Remove protective covering at the time of Substantial Completion.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

## SECTION 10410 - IDENTIFYING DEVICES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. Types of identifying devices specified in this section include the following:
  - 1. Room Signs (See Door Schedule)
  - 2. Metal Letters
  - 3. Plaque
  - 4. Project Sign
- B. Note to the Contractor: If the Contract Sum (as awarded) is \$100,000.00 or more, the Contractor shall furnish and erect a project sign and interior plaques as shown in "Detail of Project Sign" (DCM Form C-15) and "Plaque Detail" bound in the Project Manual at the end of "General Conditions". The project sign shall be erected in a prominent location selected by the Architect and Owner and shall be maintained in good condition until completion of Work.
- C. Extent of signs and plaque is indicated on the drawings.

#### 1.3 QUALITY ASSURANCE

- A. Drawings and Specifications are based on one manufacturer's standard products. Another standard system of a similar and equivalent nature may be acceptable when the differences do not materially detract from the design concept or intended performance as judged solely by the Architect.
- B. **General Contractor is responsible for verifying signage requirements and correct wording, names etc. with Owner and Architect before ordering.**

#### 1.4 SUBMITTALS

- A. Shop Drawings: Submit shop drawings for each type of device. Include large scale sections of typical members and other components. Provide dimensioned elevations. Show anchorages, grounds and reinforcement and indicate finishes.

### PART 2 - PRODUCTS

#### 2.1 ROOM SIGNS

- A. MANUFACTURER:
  - 1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
    - a. ASI Sign Systems, Inc., 8181 Jetstar Drive, Suite 100, Irving, TX 75063;  
[www.asisignage.com](http://www.asisignage.com); 1-800-274-7732
    - b. Best Sign Systems, [www.bestsigns.com](http://www.bestsigns.com); 1202 N. Park Avenue, Montrose, CO 81401-3171, Phone (970) 249-2378 or 1-800-235-2378; Fax (970) 249-0223
    - c. Leeds Architectural Letters of Alabama Inc, [www.leedsletters.com](http://www.leedsletters.com); P.O. Box 40, Leeds, AL 35094; Phone (205) 699-5271; Fax (205) 699-3342
    - d. Bayuk Graphic Systems, Inc., [www.bayukgraphics.com](http://www.bayukgraphics.com); 5005 Old Lincoln Highway Parkesburg, PA 19365; Phone: (717)-442-0274; Fax: (717)-442-1289
    - e. Mohawk Sign Systems; [www.mohawksign.com](http://www.mohawksign.com); 5 Dandreaano Dr, Amsterdam, NY 12010; Ph. 518.842.5303.

2. Substitutions: Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

**B. MATERIALS:**

1. Provide 6" x 8" high laminated plastic with raised lettering complying with the Americans with Disabilities Act (ADA).
2. All Signs MUST include 1" Slide In Window Slot.
3. Color to be selected by the Architect after bid date from manufacturer standards.
4. Use International Symbols of accessibility for identifying facilities as accessible.
5. Letters and numerals shall be raised 1/32 in (0.8 mm) minimum, upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille.
6. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm).
7. Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height.
8. **See Door Schedule. If not shown provide 20 letter characters per room sign.**
9. **The Supplier will be required to meet with the Owner for exact wording for all room signs before preparation of the shop drawing submittal to the Architect for approval.)**
10. Tactile characters on signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character.
  - a. Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side.
  - b. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf.
  - c. Where a tactile sign is provided at double doors with two active leafs, the sign shall be located to the right of the right hand door.
  - d. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall.
  - e. Signs containing tactile characters shall be located so that a clear floor space of 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position. Mounting devices shall be concealed.

**2.2 METAL LETTERS**

**A. MANUFACTURER:**

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
  - a. Impact Architectural Signs, [www.impactsigns.com](http://www.impactsigns.com); 26 E. Burlington Avenue, LaGrange, IL 60525; (708) 469-7178; [impact@impactsigns.com](mailto:impact@impactsigns.com)
  - b. Leeds Architectural Letters of Alabama Inc, [www.leedsletters.com](http://www.leedsletters.com); P.O. Box 40, Leeds, AL 35094; Phone (205) 699-5271; Fax (205) 699-3342
  - c. Matthews Architectural Products, [www.matthewsid.com](http://www.matthewsid.com); 2 North Shore Pittsburgh, PA 15212; (412) 571-5500; (800) 950-1317
  - d. A.R.K. Ramos Architectural Signage, [www.arkramos.com](http://www.arkramos.com); 1321 S. Walker Ave., Oklahoma City, OK; Ph. 800.725.7266

2. Substitutions: Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

#### B. MATERIALS

1. Provide standard cast aluminum letters for exterior architectural signage shown on drawings and as follows:
2. Building Signage: Provide full size sample prior to manufacture of all letters.
  - a. Mounting shall be projected mount without collars set in adhesive.
  - b. Color shall be anodized aluminum.
  - c. Style of letter shall be as follows:
    - I. Height: 15" High - Upper Case.
    - II. Depth: 1 ¼" Deep – Upper Case.
    - III. Font: Arial Bold
    - IV. Letters to read as indicated on drawings.

### 2.3 PLAQUE

#### A. MANUFACTURER:

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
  - a. Impact Architectural Signs, [www.impactsigns.com](http://www.impactsigns.com); 26 E. Burlington Avenue, LaGrange, IL 60525; (708) 469-7178; [impact@impactsigns.com](mailto:impact@impactsigns.com)
  - b. Leeds Architectural Letters of Alabama Inc, [www.leedsletters.com](http://www.leedsletters.com); P.O. Box 40, Leeds, AL 35094; Phone (205) 699-5271; Fax (205) 699- 3342
  - c. Matthews Architectural Products, [www.matthewsid.com](http://www.matthewsid.com); 2 North Shore Pittsburgh, PA 15212; (412) 571-5500; (800) 950-1317
  - d. A.R.K. Ramos Architectural Signage, [www.arkramos.com](http://www.arkramos.com); 1321 S. Walker Ave., Oklahoma City, OK; Ph. 800.725.7266
2. Substitutions: Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

#### B. MATERIALS

1. Refer to *Detail Of Plaque (ABC Form C-16, August 2001)* at the front end of the project manual.
2. Size: 24" high x 30" wide.
3. Cast aluminum with bronze finish of standard alloy, hand tooled and chased.
4. Raised letters and border.
5. Satin finish.
6. Background pebbled finish and oxidized to a darker finish.
7. Casting to be free of pits and holes, square and true with no warping.
8. Border style to be single line.
9. Letters to be flat face classic design.
10. Furnish Rubbing to Architect for approval.

C. Wording on the plaque shall read as follows.

<p>(NAME OF PROJECT) (CITY NAME), ALABAMA</p> <p>ERECTED (Year)</p> <p>STATE OF ALABAMA</p> <p>THE (NAME) COUNTY BOARD OF EDUCATION</p> <p>MR. (NAME), PRESIDENT</p> <p>MRS. (NAME), VICE PRESIDENT</p> <p>MR. (NAME), BOARD MEMBER</p> <p>MR. (NAME), BOARD MEMBER</p> <p>MR. (NAME), BOARD MEMBER</p> <p>MRS. (NAME), BOARD MEMBER</p> <p>MRS. (NAME), BOARD MEMBER</p> <p>DR. (NAME), SUPERINTENDENT</p> <p>SUPERVISED BY</p> <p>Alabama Real Property Management, Division of Construction Management</p> <p>McKEE AND ASSOCIATES ARCHITECTS, INC</p> <p>(COMPANY NAME), CONTRACTOR</p>
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## 2.4 PROJECT SIGN

### A. MATERIALS

1. Refer to *Detail of Project Sign (DCM Form C-15, August 2021)* at the front end of the project manual.

B. Wording on the project sign shall read as follow.

<p>STATE OF ALABAMA</p> <p>THE (NAME) COUNTY BOARD OF EDUCATION</p> <p>MR. (NAME), PRESIDENT</p> <p>MRS. (NAME), VICE PRESIDENT</p> <p>MR. (NAME), BOARD MEMBER</p> <p>MR. (NAME), BOARD MEMBER</p> <p>MR. (NAME), BOARD MEMBER</p> <p>MRS. (NAME), BOARD MEMBER</p> <p>MRS. (NAME), BOARD MEMBER</p> <p>DR. (NAME), SUPERINTENDENT</p> <p>KAY IVEY, GOVENOR</p> <p><i>"Investing in Alabama's Future"</i></p> <p>(NAME OF PROJECT)</p> <p>(CITY NAME), ALABAMA</p> <p>Alabama Real Property Management, Division of Construction Management</p> <p>McKEE AND ASSOCIATES ARCHITECTS, INC</p> <p>(COMPANY NAME), CONTRACTOR</p>
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## 2.5 FABRICATION

- A. General: Fabricate signs to comply with requirements indicated including, dimensions, design details, quality, thickness and finish of materials. Use materials and shapes of sufficient thickness, with reinforcing, if needed, to produce sufficient flatness, free of "oil canning", and to impart sufficient strength for size, design and application indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install units plumb and level, in locations and with mounting shown. Securely attach to the supporting structure with concealed fasteners, in accordance with the manufacturer's installation instructions.

### 3.2 CLEANING AND PROTECTION

- A. At completion of the installation, clean surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

## END OF SECTION

## **SECTION 10440 - FIRE EXTINGUISHERS AND ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Fire Extinguishers.
  - 2. Extinguisher cabinets.
  - 3. Accessories.
- B. Related Requirements:
  - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 REFERENCES**

- A. Reference Standards:
  - 1. ASTM International (ASTM):
    - a. ASTM E814-11a, Standard Test Method for Fire Tests of Penetration Firestop Systems.
  - 2. International Code Council (ICC):
    - a. International Building Code (IBC) - Current Edition.
  - 3. Intertek Testing Services/Warnock-Hersey International (ITS/WHI)
  - 4. National Fire Protection Association (NFPA):
    - a. NFPA 10-2010, Standard for Portable Fire Extinguishers: For criteria covering installations for Class A, B, C, D, and K hazards as well as the selection, inspection, maintenance, recharging, and testing of portable fire extinguishing equipment.
    - b. NFPA 70-2011, National Electrical Code.
  - 5. Underwriters Laboratories, Inc. (UL)
  - 6. United States Code (USC):
    - a. Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act of 2008: For restrictions relating to cabinet projections in corridors.

#### **1.3 ACTION SUBMITTALS**

- A. Submit in accordance with Section 01600:
  - 1. Product Data:
    - a. Cabinets: Materials description for fire extinguisher cabinets include roughing-in dimensions, details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, door style and materials.
    - b. Extinguishers: Materials description for fire extinguishers; include ratings and classifications.
    - c. Installation instructions for each product specified.
  - 2. Shop Drawings:
    - a. Small-scale plans showing locations of fire extinguisher cabinets and individual fire extinguishers.
    - b. Schedules showing each type of cabinet and extinguisher to ensure proper fit and function.
    - c. Indicate installation procedures and accessories required for a complete installation.



3. Samples:
  - a. Extinguisher Cabinet Door and Trim Finishes: For each type of exposed finish required, prepared on samples of size indicated below:
    - i. Size: 6 inches (150 mm) square.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Warranty: Sample of special warranty.

#### **1.5 QUALITY ASSURANCE**

- A. Comply with standards referenced in Article 1.02 - REFERENCES.
- B. Provide fire extinguishers, cabinets and accessories produced by a single manufacturer.
- C. Provide fire extinguishers of type approved by UL, State Fire Marshal's Office, and local regulatory agencies, if any.
- D. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle fire protection specialties and related materials using means and methods that will prevent damage, deterioration, or loss.
  1. Deliver components in manufacturer's original packaging, properly labeled for identification.

#### **1.7 WARRANTY**

- A. All Fire Protection Products (except fire extinguishers) carry a one year warranty after date of shipment against defects in materials or workmanship. Fire extinguishers carry a longer warranty. We will replace or repair any product found defective within this period. No other warranty expressed or implied is valid. Manufacturer's warranty, terms and conditions apply in all cases. Please see complete warranty on our website for more details.

### **PART 2 - PRODUCTS**

#### **2.1 FIRE PROTECTION SPECIALTIES MANUFACTURERS**

- A. Acceptable Manufacturers:
  1. J. L. Industries, Inc., a division of Activar Construction Products Group; 9702 Newton Av S Bloomington, MN 55431; (800) 554-6077, (952) 835-6850, (952) 835-2218 (FAX); [SALES@ACTIVARCPG.COM](mailto:SALES@ACTIVARCPG.COM); [www.activarcpg.com](http://www.activarcpg.com)
  2. Larsen's Manufacturing Company
  3. Modern Metal Products
- B. Substitutions: Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

#### **2.2 FIRE EXTINGUISHERS**

- A. Multi-Purpose Chemical Type: Extinguisher unit containing a fluidized and siliconized mono ammonium phosphate powder; nonconductive and nontoxic.
  1. Construction: Heavy duty steel cylinder with metal valve and siphon tube, O-ring seal, replaceable valve stem seal, visual pressure gage, pull pin and upright squeeze grip.
  2. Finish: Factory powder-coated; Red.
  3. Effectiveness (Rating): Class A, B, and C fires.
  4. Model Identification and UL Rating: Cosmic **10E; 4A-80BC**.
  5. "Start Up Tags" for each fire extinguisher must be provided and approved by Local Fire

Department before Final Inspection.

- B. Class K Wet Chemical Type: Extinguisher unit containing a low "pH" potassium acetate solution.
  - 1. Construction: Stainless steel cylinder with protective nozzle tip orifice seal and nonmetallic nozzle tip finger guard, O-ring seal, replaceable valve stem seal, visual pressure gage, pull pin, and upright squeeze grip.
  - 2. Effectiveness (Rating): Class K fires.
  - 3. Model Identification and and UL Rating: **25; Class K**. Capacity: 2.5 gal.

## 2.3 EXTINGUISHER CABINETS

- A. Cabinet with Steel Trim and Door:
  - 1. **Ambassador Series, Model 1017F10** at Non-Fire Rated Walls.
  - 2. **Ambassador Series, Model 1017F10FX2** at Fire Rated Walls.
- B. Cabinet Style: **Semi-recessed**.
  - 1. Tub: Cold-rolled steel.
    - a. Finish: Factory-applied powder coat paint finish.
      - i. To be selected by Architect after bid date from manufacturer Standard Colors.
  - 2. Door and Trim Construction: Cold-rolled steel; flush doors with 5/8 inch (15.88 mm) door stop attached by continuous hinge and equipped with zinc-plated handle with roller catch.
    - a. Finish: Factory-applied powder coat paint finish.
      - i. To be selected by Architect after bid date from manufacturer Standard Colors.
  - 3. Trim Style and Depth: Cabinets located in corridors shall not protrude into the hall way more than 2 1/2".
    - a. Semi-Recessed Cabinet:
      - i. Rolled Edge: 2-1/2 inch (63.50 mm).
    - b. Trim Dimensions: 1-3/4 inch (44.45 mm) face trim on frame and 1-1/4 inch (31.75 mm) face trim on door.
- C. Fire-Rating: Provide Fire-Rated cabinets for 1-hour and 2-hour combustible and noncombustible wall systems as required.

## 2.4 CABINET DOOR STYLES, GLAZING TYPES, AND ADDITIONAL OPTIONS

- A. Door Style:
  - 1. Style F: Full glazing; with pull handle.
- B. Door Glazing:
  - 1. Type 10: Clear acrylic.
- C. Additional Options:
  - 1. Cabinet Lettering:
    - a. Text: FIRE EXTINGUISHER.
    - b. Color(s): [Red] [Black] [White]. To be selected by Architect after bid date.

## 2.5 SOURCE QUALITY CONTROL

- A. Ship extinguishers to the Project site fully charged, EXCEPT those which contain water as an extinguishing agent, if any.
- B. Obtain Fire Extinguishers and Fire Extinguisher Brackets from same manufacturer to ensure compatibility.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi-recessed cabinets will be installed and blocking where surface mounted cabinets will be installed.
  - 1. Notify the Contractor in writing of conditions detrimental to proper and timely completion of the installation.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Install cabinets in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
  - 1. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
  - 2. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
  - 3. Maintain fire ratings where cabinets are recessed into fire-rated wall systems.
- B. Cabinet Lettering:
  - 1. Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" painted on door by silk screen process. Provide lettering on door as indicated, or if not indicated, as selected by Architect from manufacturer's standard letter sizes, styles, colors and layouts.

### **3.3 FIELD QUALITY CONTROL**

- A. Ensure that each extinguisher is fully charged, and that inspection of each extinguisher has been performed, as evidenced by the National Association of Fire Equipment Distributors certification tag, just prior to turnover.

### **3.4 ADJUSTING AND CLEANING**

- A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.
- E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION**

## **SECTION 10531 - ALUMINUM HANGER ROD CANOPY**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. The work covered by this section shall include furnishing and installing aluminum hanger rod canopy, with decking and fascia material. The canopy shall consist of structural aluminum panels bound by a framework of fascia which also acts as a water collecting gutter. All components shall be as required to support design loads in accordance with engineering prints and calculations provided by the manufacturer.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.
- C. Samples: Submit full range of color samples for each type of unit required.

#### **1.4 QUALITY ASSURANCE**

- A. Codes and Standards: Comply with provisions of the following except as otherwise indicated.
  - 1. International Building Code, latest addition with amendments, if any. AWS (American Welding Society) standards for structural aluminum welding.
- B. Manufacturer: Obtain aluminum covered walkway system from only one (1) manufacturer, although several may be indicated as offering products complying with requirements.
- C. Installer Qualification: Firm with not less than three (3) years experience in installation of aluminum walkway covers of type, quantity and installation methods similar to work of this section.
- D. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to insure proper fitting of work. However, allow for adjustments within specified tolerations wherever taking of field measurements before fabrication might delay work.
- E. Shop Assembly: Pre-assemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- F. Coordination: Furnish inserts and anchorages which must be built into other work for installation of rod canopy's and related work; coordinate delivery with other work to avoid delay.

#### **1.5 PERFORMANCE REQUIREMENTS**

- A. System Performance: Provide aluminum covered walkway system that has been designed, produced, fabricated and installed to withstand normal temperature changes as well as live loading, dead loading and wind loading in compliance with Standard Building Code requirements for geographic area in which work is located and as follows:
- B. The system shall be designed by a registered Engineer in the State of Alabama, certifying the system meets all wind, foundation and all other applicable loads and requirements set forth by local or state building requirements.
  - 1. Live Load:
    - a. 30 p.s.f. minimum
  - 2. Structural design for wind forces:

- a. Comply with ANSI A58.1-1982
- 3. Design Wind Velocity:
  - a. 130 m.p.h.
- 4. Importance Factor:
  - a. 1.1.
- 5. Stability Criteria:
  - a. 2015 International Building Code
- C. Sizes shown on drawings are to be considered minimum.
- D. Structure shall be capable of sustaining severe icing, hail, hurricane force winds and supporting a concentrated load such as being walked upon.

## PART 2 - PRODUCT

### 2.1 MANUFACTURERS

- A. The following manufacturers products have been used to establish minimum requirements for materials, workmanship, and function:
  - 1. Tennessee Valley Metals, Inc. **(Basis of Design and Standard or Quality)** | 190 Industrial Park Road, Oneonta, Alabama 35121 | (205) 274-9500 | [www.tvmetals.com](http://www.tvmetals.com).
  - 2. Dittmer Architectural Aluminum | 1006 Shepherd Road, Winter Springs, Florida 32708 |(800) 822-1755; (407) 699-1755 | [www.dittdeck.com](http://www.dittdeck.com); info@dittdeck.com.
  - 3. Superior Mason Products LLC. | 116 Citation Court, Birmingham, Alabama 35209 |(877) 445-1200 | [www.superiormetalproducts.com](http://www.superiormetalproducts.com); canopysales@superior-mason.com.
  - 4. Mitchell Metals | 1761 McCoba Dr. SE Suite B, Smyrna, Georgia 30080 | (770) 285-5875 | [www.mitchellmetals.net](http://www.mitchellmetals.net); sales@mitchellmetals.net.
  - 5. Gulf South Metals | 17869 Samantha Drive, Foley, Alabama 36535 | (251) 943-6443; [www.gulfsouthmetals.com](http://www.gulfsouthmetals.com); info@gulfsouthmetals.com.
  - 6. Equal products of other manufacturers may be used in the work, provided such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

### 2.2 MATERIALS

- A. All aluminum extrusions shall be alloy 6063 heat treated to a T-6 temper.
- B. Standard finish for all components shall be satin anodize 204-R1 meeting Aluminum Association Specification AA-M-10C-22A-21.
- C. Fasteners:
  - 1. Deck Screws (rivets not permitted): Type 18-8 non-magnetic stainless steel sealed with a neoprene "O" ring beneath 5/8" outside dimension, conical washer.
  - 2. Fascia Rivets: Size 3/16" by 1/2" grip range aluminum rivets with aluminum mandrel.
  - 3. Bolts: All bolts, nuts and washers to be 18-8 non-magnetic stainless steel.
  - 4. Tek Screws: not permitted

### 2.3 WARRANTY

- A. Manufacturer shall warrant the entire system against defects in labor and materials for a period of one (1) year commencing on the date of substantial completion as established in Division One of these specifications.
- B. Intention of this warranty is the manufacturer will come onto the jobsite and do all necessary to effect corrections of any deficiencies.

- C. Prima Facie Evidence of defects in labor and material may include but is not limited to, one or more of the following:
  - 1. Moisture leaks
  - 2. Metal failure including excessive deflection
  - 3. Fastener failure
  - 4. Finish failure

## **2.4 FABRICATION**

- A. Comply with indicated profiles, dimensioned requirements and structural requirements.
- B. Use sections true to details with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture, free from defects impairing strength and durability.
- C. All welding do be done by heli-arc process.
- D. Bents shall consist of shop welded one piece units. When size of bents do not permit shipment as a welded unit, concealed mechanical joints may be used.
- E. Mechanical joints shall consist of stainless steel bolts with a minimum of two (2) bolts per fastening. Bolts and nuts shall be installed in a concealed manner utilizing 1/2" thick by 1 1/2" aluminum bolt bars welded to structural members. All such mechanical joints must be detailed on shop drawings showing all locations.
- F. Roof Deck: Flush deck extruded aluminum shapes, interlocking self-flashing sections. Shop fabricate to lengths and panels widths required for field assembly. Depth of sections to comply with structural requirements. Provide shop induced camber in deck units with spans greater than 16'- 0" to offset dead load deflections. Welded dams are to be used at non-draining ends of deck.
- G. Expansion joints, design structure for thermal expansion and contraction. Provide expansion joints as required.
- H. Exposed rivets used to fasten bottom of fascia to deck to have finish to match fascia.
- I. Apply a shop applied dip-coat of clear acrylic enamel to each column end terminating in concrete to insulate from electrolytic reaction. Column ends shall be pierced to "key" grout to bent for maximum uplift protection.
- J. Finish: Provide enameled finish on all components from manufacturers standards selected by Architect, fascia and related components designed for optimum performance in exterior installations under all environmental conditions. The finish shall be applied in accordance with and conform to, or exceed the Painted Sheet "Quality Standards" and recommended ASTM, Military and/or Federal Test Methods specified by the Aluminum Association in their publication "Aluminum Standards & Data" 1972-1973. Finishes shall be updated as necessary to conform to future editions of this publication.
- K. Component Accessories: Roof Brackets, Flashing, etc., shall be of similar materials and finishes as specified for prime components. Each part and its use is described in the engineering prints and calculations provided by the manufacturer. Each part shall be used as specified in the aforementioned prints. Posts shall be used as specified.
- L. Hanger rod shall be galvanized steel pipe with finish to match other components.
- M. Hardware: All bolts, nuts, washers, and screws used in joining the members of the canopy together shall be stainless steel up to 1/4" diameter nominal size. Any hardware 1/4" diameter and larger shall be hot dip galvanized to withstand 200 hours salt spray test of maximum resistance to rust and corrosion.

## **PART 3 - EXECUTION**

### **3.1 DELIVERY, STORAGE AND HANDLING**

- A. Deliver, store and handle covered walkway system components as recommended by manufacturer. Handle and store in a manner to avoid deforming members and to avoid

excessive stresses.

### **3.2 EXAMINATION**

- A. Examine adjacent work for conditions that would prevent quality installation of system.
- B. Do not proceed until defects are corrected.
- C. Installations:
  - 1. Installed units shall have the following minimum pitch for water drainage of the roof.
  - 2. Minimum pitch for all panels and fascia - Up to 10' - 1/8th/ft.
  - 3. Installed unit shall be properly caulked with a suitable, high quality material where needed and where specified.
  - 4. Installed unit shall meet local building code requirements and conform to the engineering prints provided by manufacturer.

### **3.3 FIELD DIMENSIONS**

- A. General contractor shall field confirm bent locations, dimensions and elevations shown on shop drawings prior to fabrication.

### **3.4 CLEANING AND PROTECTION**

- A. Damaged Units: Replace roof deck panels and other components of the work which have been damaged or have deteriorated beyond successful minor repair.
- B. Cleaning: Remove protective coverings at time in project construction sequence which will afford greatest protection of work. Clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.

**END OF SECTION**

## SECTION 10800 - TOILET ACCESSORIES

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. Drawings and general provisions of contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### 1.2 RELATED DOCUMENTS

- A. Section 06100, Rough Framing for Blocking

#### 1.3 DESCRIPTION OF WORK

- B. Extent of each type of toilet accessory is indicated on drawings and schedules.
- C. **NOTE: Prior to placing any orders for items within this section, the General Contractor is responsible for verifying all toilet accessories with the Owner. Should the owner choose to provide/supply any of these toilet accessories, the General Contractor shall issue a deductive Change Order for material only. The General Contractor will maintain responsibility for installation.**
- D. Toilet Accessories **Furnished and Installed by the Contractor** as follows:
  - 1. Soap Dispensers
  - 2. Toilet Tissue Dispensers
  - 3. Paper Towel Dispensers
  - 4. Grab Bars
  - 5. Mirror Units
  - 6. Utility Shelf/Mop Rack
  - 7. Electric Hand Dryers
  - 8. Baby Changing Station
  - 9. Feminine Napkin Disposals

#### 1.4 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
- B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.
- C. Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless other- wise acceptable to Architect.

#### 1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. The following manufacturer's products have been used to establish minimum standards for materials, workmanship and function.

- 1. Soap Dispensers:

Wall Mounted over each sink

- a. Approved Products:

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

TOILET ACCESSORIES  
10800-1



- i. Bobrick #B-2112
  - ii. ASI #0345
  - iii. Bradley #6562
- 2. Toilet Tissue Dispensers:
  - a. Roll Type: (One each water closet)
  - b. Approved Products:
    - i. Bradley #5425
    - ii. ASI #0040
- 3. Paper Towel Dispensers:
  - a. Roll Type
  - b. Surface Mounted
  - c. Approved Products:
    - i. Bobrick #B52860
- 4. Grab Bars:
  - a. Where shown on Plans with Safety-Grip Finish.
  - b. Approved Products:
    - i. Bradley Corporation #8122
    - ii. Series ASI #3200P
    - iii. Bobrick #B6806.99
- 5. Mirror Units:
  - a. 18" x 38" One over each lavatory
  - b. 24" x 48" One at each Gang Toilet
  - c. Approved Products:
    - i. Bradley #780
    - ii. Bobrick #B290
    - iii. ASI #0600
- 6. Utility Shelf/Mop Rack:
  - a. Provide at all locations indicated on drawings.
  - b. Provide minimum of One (1) at each Janitor Closet if none are indicated on drawings.
  - c. Prior to installation of items within this section, the General Contractor is responsible for verifying actual installation locations with the Architect, regardless of locations indicated on drawings.
  - d. Approved Products:
    - i. ASI #1308-4 (44")
    - ii. Bradley #9934 (44')
    - iii. Bobrick #B239 x 44
- 7. Electrical Hand Dryers:
  - a. As shown on Plans at Gang Toilets
  - b. Approved Products:

- i. Excel Dryer Inc. – Hand Activated Model XL-W.
  - ii. World Dryer Corporation – Nova 5 #0212.
- 8. Baby Changing Station
  - a. At locations indicated on drawings.
  - b. Approved Products:
    - i. Koala Kare Model No. KB200
    - ii. Color to be selected by Architect after bid date from manufacturer's standards.
    - iii. Include 1 case of Bed Liners Model No. KB150-99.
- 9. Feminine Napkin Disposals
  - a. Surface Mounted (One at each Toilet Compartment – Female Restrooms). Mount on opposite wall of toilet paper dispenser.
  - b. Approved Products:
    - i. Bobrick #B-270 (Stainless Steel)
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect not less than Ten (10) days prior to scheduled bid opening.

## **2.2 MATERIALS, GENERAL**

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gage minimum, unless otherwise indicated.
- B. Mirror Units: Mirror glass shall be FS DD-G-451, Type I, Class I, Quality q2, 1/4" thick, with silver coating, copper protective coating, and non-metallic paint coating complying with FS DD-M-411. Mirror shall be provided in stainless steel frames.
- C. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

## **2.3 FABRICATION**

- A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted, except where otherwise indicated; in obtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project.
- B. Furnish two keys for each lock.
- C. Surface Mounted Toilet Accessories General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- D. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage which is fully concealed when unit is closed.

# **PART 3 - EXECUTION**

## **3.1 INSTALLATION**

- A. Install toilet accessory units in accordance with manufacturer's instructions, using fasteners which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.

## **3.2 ADJUSTING AND CLEANING**

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces after removing labels and protective coatings.

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Baldwin County Board of Education  
Bay Minette, Alabama

TOILET ACCESSORIES  
10800-3

**END OF SECTION**

## SECTION 11000 - HIGH SCHOOL GOALPOSTS AND ACCESSORIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### 1.2 SUMMARY

- A. The work required under this Section consists of providing High School Goal Posts, Wind Direction Flags, Upright Post Padding, their accessories and necessary mounting, and installation hardware.
- B. Related Work Specified Elsewhere
  - 1. Division 3, Concrete.

#### 1.3 SUBMITTALS

- A. Shop drawings shall indicate the model number, type of material, finishes, attachments and details of construction.
- B. Submit color samples and warranties as specified.

#### 1.4 WARRANTY

- A. Provide manufacturer's standard warranty on all sports & physical education equipment from the date of substantial completion as stated in this specification.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. Jaypro Sports, LLC, [www.jayprosports.com](http://www.jayprosports.com); 976 Hartford Tpk, Waterford, Connecticut 06385; Toll Free:800.243.0533 or 860.447.3001.
  - 2. Sportsfield Specialties, Inc.(Basis of Design); P.O. Box 231, 41155 State Highway 10 Delhi, NY 13753; Ph. . 888-975-3343; [www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com).
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

#### 2.2 MATERIALS

- A. Equipment shall be provided complete as per manufacturer's standard catalog description and specifications for the numbers indicated in the schedule. Equipment that is to be permanently installed shall be complete and ready for use.

##### B. HIGH SCHOOL GOALPOSTS

- 1. MAX-1 Football Goal Post; FBGP-820; Semi/Perm-8'x20'U-High School by Jaypro Sporst, LLC. (Basis of Design)
- 2. Main upright:
  - a. 6 5/8" OD x .280 Wall Aluminum Tubing
  - b. 10'-0" Height
  - c. 8'-0" offset
  - d. Semi-permanent installation; 8' offset Main upright is inserted into ground sleeve and bolted onto gooseneck

3. Crossbar:
  - a. 6 5/8" OD x .280 Wall Aluminum Tubing
  - b. 23'-4" wide (High School)
4. Uprights:
  - a. 4" OD x .226 Wall Aluminum Tubing
  - b. 20'-0" height.
5. Color of uprights and crossbar to be selected by the Architect from manufactures standards.

**C. GROUND SLEEVES, ACCESS FRAMES & COVERS**

1. Ground Sleeve; at each goal post provide:
  - a. Standard Ground Sleeve Model # FBSLV8 for MAX-1 Post (6 5/8")
  - b. Allows for Semi-permanent installation
  - c. 3 year Warranty
2. Access Frames and Covers; at each goal post provide:
  - a. Access Frame; Model #FBGPAF-1; 18"x18"x6 1/2"; For use with semi-permanent goals requiring removal from grass or turf fields.
  - b. Split panel (when goal is installed)
  - c. Full Panel (when goal is removed)
  - d. 3 year warranty

**D. WIND DIRECTION FLAGS**

1. Provide at each football goal post upright.
  - a. Model # WS-42; 4" wide x 42" long.
  - b. Provide grommets and mounting hardware
  - c. 3 year warranty

**E. STANDARD PROTECTIVE PADS**

1. Post Protector Pads; At each goal post provide:
  - a. Model # PPP-800 for MAX-1 Post (6 5/8")
  - b. 72" high
  - c. 6" thick
  - d. 14 oz. Vinyl cover
  - e. Hook and Loop closure
  - f. Color to be chosen by architect from manufacturer standard colors.
  - g. Pads to meet NCAA, NFSHSA and USVBA specifications.
2. Post Protector Padding Customization; At each goal post protective pad provide:
  - a. Multi-color lettering and graphics; Model #JSG-FPP
  - b. Colors to be selected by architect from manufacturer standard colors.
  - c. Lettering and Logo/Graphic to be provided by owner. Contractor to verify lettering and logo/graphic and color selections prior to ordering product.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Make such arrangements as are necessary to provide scaffolding to perform work under this Section. Damage to equipment, and the like shall be corrected at the expense of the Contractor under this Section.

### **3.2 INSTALLATION**

- A. Install equipment in accordance with the manufacturer's printed instructions, drawings, and specifications, and approved shop drawings.
- B. Loose equipment shall be removed from packaging or crating, cleaned, and tested for proper operation before turning over to Owner.

### **3.3 DEMONSTRATION**

- A. Work under this Section shall include demonstrating the proper use and operation of equipment to the Owner as may be required.

**END OF SECTION**

## **SECTION 11200 - GYMNASIUM EQUIPMENT**

### **PART - GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Gymnasium Equipment:
  - 1. Gymnasium Wall Padding.

#### **1.2 RELATED SECTIONS**

- A. Division 5 (Division 05) Metals Sections: Structural steel and steel joists.
- B. Division 9 (Division 09) Finishes Section: Finish painting of factory-primed surfaces.

#### **1.3 REFERENCES**

- A. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM F 2440 – Standard Specification for Indoor Wall/Feature Padding.
- C. Federal Standard 191 – Textile Test Methods.
- D. NFPA 101 – Life Safety Code.
- E. NFPA 255 – Surface Burning Characteristics of Building Materials.
- F. NFPA 286 – Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- G. NFPA 701 – Methods of Fire Tests for Flame-Resistant Textiles and Films.
- H. UL 214 – Test for Flame-Propagation of Fabrics and Films.

#### **1.4 SUBMITTALS**

- A. Comply with Section 01330 (01 33 00) – Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including materials, components, fabrication, finish, and installation instructions.
- C. Shop Drawings:
  - 1. Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating locations, quantities, dimensions, tolerances, materials, fabrication, connections, hardware, fasteners, finish, electrical wiring diagrams, options, and accessories.
  - 2. Show location and detail of attachment to building structure.
- D. Samples: Submit manufacturer's color samples.
  - 1. Wall wainscot padding.
- E. Design Data:
- F. Test Reports: Submit manufacturer's certified test reports from testing performed by accredited independent testing laboratory, indicating compliance of materials with requirements as specified.
- G. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- H. Manufacturer's Project References: Submit manufacturer's list of recently completed projects, including project name and location, name of architect, and type and quantity of gymnasium and play field equipment installed.
- I. Operation and Maintenance Manual: Submit manufacturer's operation and maintenance manual; including operation, maintenance, adjustment, and cleaning instructions; trouble shooting guide; parts list; and electrical wiring diagrams.
- J. Warranty: Submit manufacturer's standard, lifetime, and additional warranties.

## 1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide gymnasium equipment from single manufacturer.
- B. Manufacturer's Qualifications: Minimum of 5 consecutive years experience manufacturing gymnasium and play field equipment similar to that specified.
- C. Installer's Qualifications: Trained and approved by manufacturer.
- D. Regulatory Requirements: Gymnasium equipment shall conform to latest rules and regulations.
  - 1. Federation Internationale de Football Association (FIFA).
  - 2. International Basketball Federation / Federation International de Basketball (FIBA).
  - 3. National Association for Girls and Women in Sport (NAGWS).
  - 4. National Basketball Association (NBA).
  - 5. National Collegiate Athletic Association (NCAA).
  - 6. National Federation of State High School Associations (NFHS).
  - 7. USA Volleyball (USAV).

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions. Keep temporary protective coverings in place.
- C. Handling: Protect materials and finish from damage during handling and installation.

## 1.7 WARRANTY

- A. Provide 1-year warranty against defects in materials and workmanship, unless otherwise specified.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURER

- A. Porter Athletic, Inc. [Basis of Design] | 601 Mercury Drive, PO Box 1790, Champaign, Illinois 61824-1790. | Phone (217) 367-8438. Fax (217) 239-2255. | [www.porterathletic.com](http://www.porterathletic.com).
- B. Jaypro Sports, LLC. | 976 Hartford Tpk, Waterford, CT 06385 | PH: 800-243-0533 (Toll Free) | 860-447-3001 | [www.jayprosports.com](http://www.jayprosports.com).
- C. Draper, Inc. | 411 South Pearl St., Spiceland, Indiana 47385 | 765-987-7999 | 800-238-7999 | [www.draperinc.com](http://www.draperinc.com).
- D. Performance Sports System | 9200 E 146th St. | Noblesville, Indiana 46060 | (317) 774-9840 | [www.perfsports.com](http://www.perfsports.com).
- E. AALCO Manufacturing | 1650 Avenue H St. Louis, MO 63125 | 314-544-4300 | 314-544-4300 | email: [sales@aalcomfg.com](mailto:sales@aalcomfg.com) | [www.aalcomfg.com](http://www.aalcomfg.com).
- F. Equal products of other manufacturers may be used in the work provided, such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

### 2.2 GYMNASIUM WALL PADDING

- A. Porter Athletic – Model # 3563xx
  - 1. Shock Absorption: ASTM F 2440, meet minimum standard.
    - a. The Maximum gMAX values for the padding shall not exceed 200 and the HIC shall not exceed 1000 when tested at a 4 foot Drop Height.



2. Cover Material: Designated as flame resistant in accordance with NFPA 701 and State of California.
3. Wall Pad Dimensions: 2'-0" wide by 6'-0" high by 2" thick.
4. Nailing Margin: 1-inch nailing margin top and bottom for securing panels to wall.
5. Foam: 2 inch thick polyethylene foam.
6. Interior Foam: Bonded to 7/16-inch OSB to minimize warping.
7. Entire Face of Panel, Including Nailing Margins: Upholstered in 19-ounce, fire-retardant, high-tensile, vinyl-coated polyester fabric material with leather-like embossed finish.
8. Cover Material Tear Strength: 100 psi.
9. Cover Material Properties: Mildew resistant, rot resistant, with infection-combating fungicide.
10. Fold and securely staple cover to backside of OSB.
11. Color: To be selected by Architect from manufacturer standards after bid date.
12. Column Pads: Same construction as wall pads mounted on  $\frac{3}{4}$ " OSB plywood backing mounted to columns. Equal to Aalco Model #CCP-1. Height of column pads shall be 8'-0" high. Color to match wall pads.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine areas and supporting structure to receive gymnasium and play field equipment. Notify Architect in writing of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

#### **3.2 INSTALLATION**

- A. Install gymnasium and play field equipment in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install equipment plumb, level, straight, square, accurately aligned, correctly located, to proper elevation, and secure.
- C. Install equipment using manufacturer's supplied hardware and fasteners.
- D. Wall Padding: Form or cutout panels for columns, electrical outlets, wall switches, and other items as required.
- E. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- F. Remove and replace damaged components that cannot be successfully repaired, as determined by Architect.

#### **3.3 ADJUSTING**

- A. Adjust operating equipment to function properly and for smooth operation without binding.

#### **3.4 CLEANING**

- A. Clean gymnasium and play field equipment promptly after installation in accordance with manufacturer's instructions.
- B. Remove labels and temporary protective coverings.
- C. Do not use harsh cleaning materials or methods that would damage finish.

#### **3.5 DEMONSTRATION**

- A. Demonstrate operation and maintenance of gymnasium and play field equipment to Owner's personnel.
- B. Furnish Owner with keys to equipment after demonstration.

### **3.6 PROTECTION**

- A. Protect installed gymnasium and play field equipment to ensure equipment will be without damage or deterioration at time of substantial completion.

**END OF SECTION**

## SECTION 11201 - BATTING CAGES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. Extent of batting cages equipment is shown on drawings.
- B. General Scope: Provide system complete and ready for use, including standards, nets, cable, hooks, ropes, etc.
- C. Equipment shall be unloaded from transporters and installed by equipment manufacturers or their authorized agent.

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, specifications, installation, and maintenance instructions for each type of equipment required.
  - 1. Provide templates for anchor bolts and other items encased in concrete or below finished surfaces in time to not delay work.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
  - 1. PSS Performance Sports Systems./Gared Holdings, LLC.; 9200 E. 146<sup>th</sup> St., Noblesville, IN 46060; p. 800-757-6081; [www.perfsports.com](http://www.perfsports.com)
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

#### 2.2 MATERIALS

- A. BATTING CAGE
  - 1. 4080-70 – Indoor Multi-Sport Cage Model 4080 Multi Sport Cage: Electrically operated cage including motor, cables, controls, clamps for attachment to building structure, threaded rod supports, and other components required for complete functional installation
  - 2. Quantity: **As Indicated on Plans**
- B. Components:
  - 1. OVERHEAD SUPERSTRUCTURE:
    - a. The batting cage is supported from the roof structure by directly attaching to the underneath side of the roof truss or by attaching to Uni-strut, 4/O Chain, or 3 ½" O.D. horizontal and 2 3/8" O.D. vertical structural tubing supplied by the manufacture. Bridge pipe will be required when truss spans exceed 14'. Superstructure shall be furnished with standard black finish.
  - 2. NET MATERIAL
    - a. Cage net shall be model 4087, 12'-0" [3.66 m] high x 12'-0" [3.66 m] wide by 70' [21.3 m] long. An additional 12" [3.66 m] of net shall drape on the floor preventing balls from going under the cage. Net shall be constructed with #252 black knotted nylon with 3/4" [19 mm] square mesh and shall be capable of stopping a baseball, softball and golf ball. Entrance shall be through an overlapping net opening on each end. This feature shall allow one sidewall to be opened for use as a golf cage. Contact factory for special sizes

and materials.

### 3. DRIVE / SUPPORT STRUCTURE

- a. The model 4080-70 Multi-Sport Cage shall be operated by an electric curtain hoist, model 4102. Hoist is available in various voltages and frequencies. Hoist shall be driven by an instant reversing,  $\frac{3}{4}$  horsepower, electric gear-motor that is controlled with a key switch and integral limit switches.
- b. Curtain hoist shall drive a continuous 2-3/8"[60 mm] O.D. drive shaft. The cage shall be lifted by means of 1/8" [3 mm] galvanized aircraft cable rated at 2000 lbs [907 kg] breaking strength. Lift cables shall be spaced at no greater than 12'-0" [3.66 m] center to center. Each cable shall be taken up on individual aluminum spools located on the drive shaft.
- c. The drive shaft shall be supported by a carrier assembly spaced no greater than 12'-0" [3.66 m] center to center. The carrier shall consist of a formed bracket with two rubber wheels on which the drive shall rotate.
- d. Cage support frame shall be constructed of 1.9" O.D. steel tubing. Support frame shall be furnished with standard black powder coat finish. Optional colors available. The support frame may be lowered to the floor while placing the four sides of netting on top of the frame to allow for compact storage.
- e. The top of the cage net shall be suspended approximately 6" [152 mm] below the cage support frame.

### 4. CONTROLS

- a. Provide key lock, 3-position, momentary contact wall control switch to lower, raise, and stop gymnasium practice cage. Provide with switch box and stainless steel polished cover plate.
- b. Safety delay: Provide safety delay for motor such that when key is turned in opposite direction of curtain travel, motor shut offs momentarily and then reverses to opposite direction.

## 2.3 WARRANTY

- A. Warranted against defects in material and/or fabrication for 12 months from the date of delivery.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Install equipment in accordance with manufacturer's instructions and placement drawings.
- B. Coordinate placement of anchors and accessories.

### END OF SECTION

## SECTION 13120 - PRE-ENGINEERED BUILDING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and Division 1 Specifications sections apply to work specified in this Section.

#### 1.2 SUMMARY

- A. Extent of pre-engineered buildings work is shown on drawings.
- B. Building Type: The pre-engineered building system shown is a single story, rigid frame type metal building of the nominal length, width, eave height and roof pitch indicated.
  - 1. Manufacturer's standard components may be used, providing components, accessories, and complete structure conform to architectural design appearance shown and to specified requirements.
  - 2. Concrete floor and foundations and installation of anchor bolts are specified in a Division 3 section. Provide anchor bolts (including sizes and lengths) and anchor bolt plan to Contractor for work by others.
  - 3. Sealants and caulking are specified in Division 7 section.
  - 4. Provide blanket insulation under roof and inside walls as indicated on drawings and specified in Section 07200, Insulation.
  - 5. Provide prefinished metal roof panels as indicated on drawings and specified in Section 07410, Preformed Metal Roofing.
  - 6. Provide interior and exterior wall panels as indicated on drawings and specified in Section 07411, Metal Wall Panel and Section 09800, Acoustical Metal Wall Panel System
  - 7. Provide prefinished fascia, vented/non-vented soffit systems, flashing, drip edge, trim, gutters and downspouts as indicated on drawings and specified in Section 07600, Flashing and Sheet Metal.

#### 1.3 DESCRIPTION

- A. Provide all materials, labor, equipment and services, and perform all operations in connection with the furnishing and installing of pre-engineered building, in accordance with the drawings and specifications, including the following:
  - 1. Metal Framing Components
  - 2. Metal Building Accessories
  - 3. Workmanship
  - 4. Inspection of Surfaces
  - 5. Protection
  - 6. Delivery, Samples and Shop Drawings
  - 7. Guarantee and Warranty

#### 1.4 SUBMITTALS

- A. **Any deviation (deletions, additions or revisions thereof) from the requirements of the Contract Documents contained in a Submittal shall be clearly identified as a "Deviation from Contract Requirements" (or by similar language) within the Submittal in 'RED' and, in a letter transmitting the Submittal to the Architect, the Supplier and Contractor shall direct the Architect's attention to, and request specific approval of, the specific deviations. Otherwise, the Architect's approval of a Submittal does not constitute approval of any deviation from the requirements of the Contract Documents contained in the Submittal.**

**Should any deviation be found at a later date, the Supplier and Contractor shall bear the responsibility and cost of all corrections required.**

- B. Product Data: Submit manufacturer's product information, specifications and installation instructions for building components and accessories. Submit sample warranty.
- C. Shop Drawings: Submit complete erection drawings showing anchor bolts settings, sidewall, endwall, and roof framing, transverse cross sections, covering and trim details, and accessory installation details to clearly indicate proper assembly of building components.
  - 1. The shop drawings **MUST** be submitted as an "overlay" drawing to the Architectural drawings.
  - 2. The Contractor/supplier **MUST** provide the "overlay" drawings **including the Architectural drawings in the complete submittal.**
  - 3. The "overlay" drawings must be submitted in 'RED' with the Architectural drawings in 'BLACK'.
- D. Samples: The contractor shall submit roofing samples of finished roofing system for pre-engineered buildings per Section 07410, Preformed Metal Roofing.
- E. Certification: Submit written Certification and all structural calculations prepared and signed by a Professional Engineer, registered to practice in the State where building is to be erected, verifying that building design meets indicated loading requirements and codes of authorities having jurisdiction. Calculations shall clearly show all loads used for the design of each member. All column reactions at the foundation shall be provided for verification of the foundation design.

## **1.5 QUALITY ASSURANCE**

- A. Design Criteria:
  - 1. All items below shall be designed within the architectural design furring spaces. Refer to submittal requirements above for deviations made from the requirements of the Contract Documents.
  - 2. Structural Framing: Design primary and secondary structural members and exterior covering materials for applicable loads and combinations of loads in accordance with the Metal Building Manufacturers Association's (MBMA) "Design Practices Manual".
  - 3. Structural Steel: For design of structural steel members, comply with requirements of the American Institute of Steel Construction's (AISC) "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" for design requirements and allowable stresses.
  - 4. Light Gage Steel: For design of light gage steel members, comply with requirements of the American Iron and Steel Institute's (AISI) "Specification for the Design of Cold Formed Steel Structural Members" and "Design of Light Gage Steel Diaphragms" for design requirements and allowable stresses.
  - 5. Welded Connections: Comply with requirements of the American Welding Society's (AWS) "Standard Code for Arc and Gas Welding in Building Construction" for welding procedures.
  - 6. Impact Resistance: Roof coverings installed on low-slope roofs (roof slope  $<2:12$ ) shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" FM 4470.
- B. Design Loads: Building shall meet all applicable Codes.
  - 1. Basic design loads include live load, wind load and up-lift, in addition to the dead load. Minimum acceptable design loads and deflection criteria are shown on the drawings.
  - 2. Design each member to withstand stresses resulting from combinations of loads that produce the maximum allowable stresses in that member as prescribed in MBMA's "Design Practices Manual".
- C. Manufacturer's Qualifications: Provide pre-engineered metal buildings as produced by a manufacturer with not less than 5 years successful experience in the fabrication of

pre-engineered metal buildings of the type and quality required. Manufacturer will be a member of the MBMA.

- D. Erector's Qualifications: Pre-engineered building shall be erected by a firm that has not less than 5 years successful experience in the erection of pre-engineered buildings similar to those required for this project, and that has been licensed by the manufacturer of the building system.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Deliver and store prefabricated components, sheets, panels and other manufactured items so they will not be damaged or deformed.
- B. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight ventilated covering. Store metal sheets or panels so that water accumulations will drain freely. Do not store sheets or panels in contact with other materials which might cause staining.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURER**

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
1. ACI Building Systems
  2. American Buildings Company
  3. Bigbee Steel Buildings, Inc.
  4. Butler Buildings Company
  5. Ceco Building Systems
  6. Mesco Buildings
  7. Morin Building Systems
  8. NCI Building Systems
  9. Nucor Building Systems
  10. Varco-Pruden Building System

### **2.2 MATERIALS**

- A. Hot-Rolled Structural Shapes: Comply with requirements of ASTM A36 or A529.
- B. Tubing or Pipe: Comply with requirements of ASTM A500, Grade B, ASTM A501, or A53.
- C. Members Fabricated from Plate or Bar Stock: Provide 42,000 psi minimum yield strength. Comply with requirements of ASTM A529, A570 or A572.
- D. Members Fabricated by Cold Forming: Comply with requirements of ASTM A607, Grade 50.
- E. Bolts for Structural Framing: Comply with requirements of ASTM A307 or A325 as necessary for design loads and connection details.

### **2.3 PRIMARY FRAMING**

- A. Rigid Frames shall be fabricated from hot-rolled structural steel. Provide built-up "I-beam" shape rigid frames consisting of either tapered or parallel flange beams and straight columns. Provide frames factory welded and shop painted. Furnish frames complete with attachment plates, bearing plates and splice members. Factory drill frames for bolted field assembly.
1. Provide length of span and spacing of frames indicated. Slight variations in length of span and frame spacing may be acceptable if necessary to meet manufacturer's standard, and if approved by the Architect.
  2. Provide rigid frames at endwalls where indicated.
- B. End Wall Columns: Provide factory welded, shop painted endwall columns built-up "I" shape

welded plate.

- C. Wind Bracing: Provide horizontal and adjustable wind bracing at roof only using diagonal cables or threaded steel rods; comply with requirements of ASTM A36 or A572, Grade D.

## **2.4 SECONDARY FRAMING**

- A. The spacing of all purlins as shown on the drawings is diagrammatic, therefore, the Registered Professional Engineer for the Pre-Engineered Building shall be responsible for the design of the roof structure to support the framing to meet all state, federal and local code restrictions and structural requirements set forth by the structural engineer. It shall be the responsibility of the Pre-Engineered Building manufacture to coordinate with the Bidding Contractor the amount of erection required for the roof framing before bidding.
- B. Provide not less than 16-ga. shop painted rolled formed sections for the following secondary framing members unless shown otherwise on structural contract drawings.
  - 1. Purlins.
  - 2. Eave struts.
  - 3. Endwall rafters.
  - 4. Flange bracing.
  - 5. Sag bracing.
- C. Provide not less than 14-ga. cold-formed galvanized steel sections for the following secondary framing members:
  - 1. Base channels.
  - 2. Sill angles.
  - 3. Endwall structural members (except columns and beams).
  - 4. Purlin spacers.
- D. Bolts: Provide ASTM A307 bolts, at secondary structural connections. Provide zinc-plated or cadmium-plated bolts when structural framing components are in direct contact with roofing and siding panels. Primary structural connections to be made with ASTM A325 bolts.
- E. Shop Painting: Clean surfaces to be primed of loose mill scale, rust, dirt, oil, grease, and other matter precluding paint bond. Follow procedures of SSPC-SP3 for power tool cleaning, SSPC-SP7 for brush-off blast cleaning, and SSPC-SPI for solvent cleaning.
  - 1. Prime structural steel primary and secondary framing members. See Structural Steel 05500 page 3 - Structural Steel Prime Paint and page 5 - Shop Painting.
  - 2. Prime galvanized members, after phosphoric acid pretreatment with manufacturer's standard zinc dust-zinc oxide primer.

## **2.5 ROOFING, WALL PANELS, SHEET METAL ACCESSORIES & MISC. MATERIALS**

- A. See Section 07410 – Preformed Metal Roofing
  - 1. Manufacturer's Warranty
    - a. **Manufacturer's roofing warranties which contain language regarding the governing of the warranty by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such warranties.**
- B. See Section 07411 – Metal Wall Panels

## **2.6 FACIA, SOFFIT, FLASHING, DRIP EDGE, TRIM, GUTTERS AND DOWNSPOUTS**

- A. See Section 07600 – Flashing and Sheet Metal



## **2.7 FABRICATION**

- A. General: Design prefabricated components and necessary field connections required for erection to permit easy assembly and disassembly. Fabricate components in such a manner that once assembled, they may be disassembled, repackaged and reassembled with a minimum amount of labor.
  - 1. Clearly and legibly mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams and instruction manuals.
- B. Structural Framing: Shop fabricate structural framing components to the indicated size and section complete with base plates, bearing plates and other plates required for erection, welded in place. Provide required holes for anchoring or connections either shop drilled or punched to template dimensions.
  - 1. Shop Connections: Provide power riveted, bolted or welded shop connections.
  - 2. Field Connections: Provide bolted field connections.

## **PART 3 - EXECUTION**

### **3.1 ERECTION**

- A. Framing: Erect structural framing true to line, level and plumb, rigid and secure. Level base plates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use a non-shrinking grout to obtain uniform bearing and to maintain a level base line elevation. Moist cure grout for not less than 7 days after placement.
- B. Purlins and Girts: Provide rake or gable purlins with tight fitting closure channels and fascias. Locate and space wall girts to suit door and window arrangements and heights. Secure purlins and girts to structural framing and hold rigidly to a straight line by sag rods.
- C. Bracing: Provide Temporary Cross Bracing as required for full height of bays. Temporary cross bracing shall be removed upon completion of final cross bracing.
- D. Final Cross Bracing shall be as shown and described on the Structural Drawings. The Contractor shall furnish and install cross bracing as directed by the Structural Engineer – no exceptions. Portal frames are not permitted.
- E. Framed Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical or electrical work. Securely attach to building structural frame.

### **3.2 ROOFING, WALL PANELS, SHEET METAL ACCESSORIES & MISC. MATERIALS**

- A. See Section 07410 – Preformed Metal Roofing
  - 1. A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect and attended by representatives of the Owner, Division of Construction Management Inspector, General Contractor, Roofing Contractor, Sheet Metal Contractor, Roof Deck Manufacturer (if applicable), and the Roofing Materials Manufacturer (if warranty is required of this manufacturer). If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting. Provide at least 72 hours advance notice to participants prior to convening pre-roofing conference.
  - 2. The pre-roofing conference is intended to clarify demolition and application requirements for work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details, and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer's requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.

3. The following are to be accomplished during the conference:
  - a. To review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
  - b. To establish trade-related job schedules, including the installation of roof-mounted mechanical equipment.
  - c. To establish roofing schedule and work methods that will prevent roof damage.
  - d. Require that all roof penetrations and walls be in place prior to installing the roof.
  - e. To establish those areas on the job site that will be designated as work and storage areas for roofing operations.
  - f. To establish weather and working temperature conditions to which all parties must agree.
  - g. To establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.
4. The Architect shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project record and copies furnished the General Contractor, the Owner, the Division of Construction Management, and the Division of Construction Management Inspector.

B. See Section 07411 – Metal Wall Panels.

### **3.1 INSULATION**

A. See Section 07200 – Insulation.

1. Thermal Breaks:
  - a. Provide thermal blocks/breaks at all roof to purlin connections points.
  - b. 1/8 inch (3 mm) thick by 3 inch (76 mm) wide white, closed-cell polyethylene foam with pre-applied adhesive film and peel-off backing.
  - c. Polystyrene Snap-R snap-on thermal blocks.

**END OF SECTION**

## **SECTION 13342 – BLEACHER SYSTEMS AND PRESS BOX**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

Drawings and general provisions of the Contract; including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this section.

#### **1.2 SCOPE OF WORK**

Bleacher Systems and Press Box systems are to be provided by a single source manufacturer.

Provide labor, materials, equipment, engineering, installation to provide a new custom aluminum bleacher system and industrialized 8' x 24' press box in accordance with the following specifications:

A. Minimum acceptable criteria:

1. Design per plan view and sectional view drawings.
2. The overall length of grandstand shall be as per architectural drawings.
3. The number of rows shall be as per architectural drawings.
4. Height of front walkway from grade shall be as per architectural drawings.
5. Width of front walkway to be as per architectural drawings.
6. The rise per row shall be as per architectural drawings.
7. The depth per row shall be as per architectural drawings.
8. Net seating capacity shall be as per architectural drawings.
9. The riser shall be structurally connected to the decking system panel every 12" longitudinal with ¼" diameter structural grade rivet.
10. There shall be no gaps or cavities between the riser portion of the decking system and any supports or attachments.
11. ADA seating shall be as per architectural drawings.
12. Aluminum extrusions using alloy 6063-T6 and 6061-T6.
13. Understructure members shall be constructed using square tube and aluminum angle extrusions. Vertical columns should have a dimension of 2" x 2" and a minimum wall thickness of 1/8" on all columns except the terminal column which should be 3"x 2". The footboard supports and bases angles should be 2" x 1.1/2"x 3/16" aluminum angle. All diagonal bracing should be 1.1/2" x 1.1/2" x 3/16" aluminum angle.
14. All mating connections to create the understructure framing system shall be welded connections and shall be welded on all sides.
15. All welded connections shall be by certified aluminum welders
16. All understructure frames shall be treated after fabrication by a system that employs a commercial cleansing and rinse procedure.

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

BLEACHER SYSTEMS AND PRESS BOX  
13342-1

17. Aisle and Egress stairs shall have a ½" overlap.
18. At locations where platforms meet end to end a beveled four-inch-wide aluminum threshold extrusion shall be provided to cover the walking surface.
19. Seat support system shall be universally adjustable to any location on the vertical plane of the decking system.
20. All seat support, aisle step supports, aisle handrails and risers shall be installed from the topside of the decking system. There shall be no through bolting of these items through the riser system.
21. Guardrail system shall be constructed with all-aluminum support posts and railings with black vinyl coated chain link fencing.
22. Bleacher manufacture must have a written quality control program for manufacturing, shipping and installation.
23. Walking surface shall be fluted non-skid and slip resistant.

B. Related Sections include the following:

1. Division 3 Section "Cast-in place Concrete" for concrete mix design and testing requirements.

### 1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide a complete, custom bleachers system mutually dependent components and assemblies that form a custom system capable of with standing structural and other loads, thermally induced movement, and exposure to weather without failure. Include primary and secondary framing, decking system, seating, handrails /guardrails, press box and accessories complying with requirements indicated, including those in this Article.
- B. Structural Performance: Provide bleacher system capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Design Loads / Structural – Framing Members
    - a. Dead Loading: 6 PSF for understructure
    - b. Live Loads: 100 PSF for understructure
  2. Design Loads / Decking System
    - a. Dead Loading: 6 PSF for decking, platforms, stairs and ramps
    - b. Live Loads: 100 PSF for decking, platforms, stairs and ramps
    - c. Deflection Limits: engineer assemblies to withstand design loads with deflections no greater than the following:
      1. Decking, platforms, stairs and ramps: vertical deflection of L/360

- d. Sway loads of 24 PLF per row parallel to seat and 10 PLF per row perpendicular to seat run.
- 3. Design Loads / Handrail / Guardrail
  - a. 100 PLF Vertical
  - b. 50 PLF applied in any direction
  - c. 200 LB Concentrated load any direction
  - d. 50 PSF fencing and infill
- 4. Design Loads / Seat Boards
  - a. Live Loads: ( vertical) 120 pounds per lineal foot

#### **1.4 SUBMITTALS**

- A. Shop Drawings: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following grandstand system components:
  - 1. Foundations:
    - a. Footings, slab and reinforcement.
  - 2. Structural framing:
    - a. Primary and secondary framing including but not limited to the following:
      - 1.) Vertical & Horizontal Members
      - 2.) Bracing
      - 3.) Connecting hardware
  - 3. Welded Decking System:
    - a. Decking Platforms
    - b. Risers
    - c. Supports for Seats
    - d. Aisle Steps
    - e. Aisle Handrails
    - f. Egress Stairs
    - g. Hardware
  - 4. Seating
  - 5. Handrails / Guardrails
  - 6. Ramps

#### **1.5 QUALITY ASSURANCE**

- A. Concrete Installers Qualifications: Flat and level concrete pad by others
- B. Erector Qualifications: An experienced erector who has specialized in installing bleacher system and press box system similar in material, design, and extent to that indicated for this Project. Erector must be certified by manufacturer.
- C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where project is located and

Additions to Elberta  
 High School for the  
 Baldwin County Board of Education  
 Bay Minette, Alabama

BLEACHER SYSTEMS AND PRESS BOX  
 13342-3

who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installation of bleacher and press box systems that are similar to those indicated for this Project in material, design and extent. All approval drawings shall bear the seal of a registered professional engineer in the state of installation.

- D. Quality Control: Manufacturer's written quality control for manufacturing, shipping and installation shall be submitted prior to award of contract.
- E. Standards and Guidelines: Comply with the provisions of the following codes, specifications and standards, latest editions, except as otherwise noted or specified:
  - a. American Concrete Institute (ACI)
  - b. Aluminum Association of American
  - c. American Welding society (AWS)
  - d. Americans with Disabilities Act (ADA)
  - e. International Building Code (IBC)
  - f. International Code Council 300 (ICC 300)
- F. Site visitation: Bidder shall visit the job site prior to the bid date. At the time of visitation, bidder must verify site conditions.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Package all items for protection during transportation and handling.
- B. Do not store items on the job site in contact with other materials that might cause staining, denting or other surface damage.

## **1.7 WARRANTY**

- A. All products shall carry, after proper erection, and under normal use for the type of structure a one (1) year warranty against all defects in materials and workmanship.

## **PART 2 PRODUCT**

### **2.1 MANUFACTURER**

Outdoor Aluminum, Inc. Geneva, AL (Basis of design); 1-800-225-4249

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

Additions to Elberta  
High School for the  
Baldwin County Board of Education  
Bay Minette, Alabama

BLEACHER SYSTEMS AND PRESS BOX  
13342-4

Bleacher Systems and Press Box systems are to be provided by a single source manufacturer.

## **2.2 UNDERSTRUCTURE:**

- 1 The understructure of the system shall consist of a series of aluminum frames spaced at intervals of no more than 6-0' and joined by means of aluminum sway braces.
2. Each stringer shall consist of vertical members, adequate diagonal braces, and horizontal members welded to form the proper rise per row and proper back to back spacing between seat rows.
3. All welded connections shall be by certified aluminum welders, and all mating parts shall be welded on all sides to assure adequate strength.
4. Vertical members shall be constructed on 2" x 2" x 1/8" square tube aluminum for all columns except the terminal column which should be 3" x 2" x 1/8" square tube aluminum, alloy 6061-T6, mill finish.
5. Horizontal members shall be constructed of 2" x 1.5" x 3/16" aluminum angle, alloy 6061-T6, mill finish.
6. Sway braces shall be constructed of 1.5" x 1.5" x 3/16" aluminum angle, alloy 6061-T6, mill finish

## **2.3 DECKING SYSTEM:**

- A. Decking System Platforms shall consist of extrusions laid side by side to form the tread width. These individual extrusions are then clamped and factory fixture welded. The treads shall be welded in a single pass with .0035 diameter 4043 welding wire, using argon gas. This method will result in a rigid, positively joined tread. Individual tread lengths shall be a maximum length of 37'-6" with the actual length designed to create the minimum number of expansion seams. Decking shall be attached to the supporting aluminum tube understructure by means of concealed aluminum clips, galvanized bolts, washers and nuts.
- B. Platforms shall have a minimum aluminum wall thickness of .078" and aluminum shall be alloy 6063-T6.
- C. Walking surface shall be fluted non-skid and slip resistant.
- D. The rear portion of the platform will turn ninety degrees vertical to accept the next row of decking platforms. The front portion of the platform shall be complete with a female front edge to allow for a positive male / female connection of a vertical riser.
- E. At locations where platforms meet end to end a beveled four inch wide aluminum threshold extrusion shall be provide to cover the walking surface. Threshold shall be beveled on both sides so as not to create a trip hazard and must have a fluted surface to prevent slipping. Threshold

must comply with specified deflection criteria and once installed must allow for expansion and contraction.

F. Decking System Riser

1. The decking system riser shall be extruded aluminum; alloy 6063-T6 with a 204 R1 anodized clear finish.
2. This extrusion shall have a male ridge running continuous at the upper leading edge to interlock with the front portion of the decking system panel.
3. The riser shall be structurally connected to the decking system panel every 12" longitudinal with ¼" diameter structural grade rivet.
4. There shall be no gaps or cavities between the riser portion of the decking system and any supports or attachments.

G. Decking System Seat Supports

1. The decking system seat support shall be of extruded aluminum angle.
2. Once installed the seat support shall have no noticeable gaps between the decking system riser and support.
3. Seat support system shall be universally adjustable to any location on the vertical plane of the decking system.

H. Decking System Aisle Handrails

1. The decking system aisle handrails shall be 1-5/8" schedule 40 anodized aluminum pipe.
2. Handrails shall have a center line handrail and the spacing between rails shall not be less than 22" or more than 36". Handrails shall be discontinuous and shall not span more than five rows of seating.

I. Decking System Egress Stairs

1. The decking system egress stair stringers are to be constructed of 8" aluminum channel, alloy 6061-T6. Tread supports to be welded to 8" member to totally cap the end of the 2" x 12" stair tread against the channel web.
2. Walking surface of tread shall be complete with female front edge to allow for positive male / female connection of the riser closure. All risers to be fastened to the rear tail of the stair tread with ¼" diameter structural grade rivet.
3. Stair tread nosing to be anodized black. Nosing shall have no external fasteners.
4. Stair grab rail to be constructed of 1-5/8" schedule 40 anodized aluminum pipe with no fittings at transition from sloped system to grade.



J. Decking System Hardware

1. All bolts, washers and nuts shall be galvanized.
2. End caps shall be of a heavy duty, clamping, aluminum channel design fastened to the ends of extrusions with aluminum rivets. End caps shall close all end openings of extrusions and shall be a full-length piece and match in both color and finish the extrusion to which they attach.
3. All riser fasteners shall be structural 1/4" diameter structural grade rivet.

**2.4 SEATING AND OPTIONS**

A. Bench Seating

1. Seats shall be of extruded aluminum with a fluted non-skid surface, alloy 6063-T6, with 204R1 anodized clear finish
2. Plank shall be 2" by 10" nominal with a wall thickness of .078" (+ / - .006" industry tolerance) at the smooth surface.
3. Finish size shall be 1-3/4" by 9-1/2"
4. Seats shall attach to the decking system seat supports by means of concealed aluminum clips, galvanized bolts, washers and nuts.
5. Seat supports shall be installed on centers that will allow for the same design deflection criteria required by code.
6. End caps shall be of extruded aluminum and shall match in both color and finish the plank to which they attach. All end caps shall be single piece and shall attach to the underside of the plank with a minimum of two aluminum rivets.

**2.5 HANDRAILS / GUARDRAILS**

1. All railing shall consist of 1-5/8" schedule 40 anodized pipe.
2. All pipe fittings shall be of cast aluminum.
3. Guardrail supports to be 3" aluminum channel, alloy 6061-T6.
4. Rail pipe shall be secured to the guardrail support by means of galvanized tension bands.
5. The top rail shall be 42" minimum above the nearest seat on the sides and rear, and 42" above the tread on the front walkway.
6. Handrails on stairs shall be 34" above the leading most edge of the stair tread.
7. Black vinyl chain link fence shall be provided on the front, sides and rear of the grandstand and at all egress areas.
8. Handrails shall be provided at all walking areas and shall extend 1-1/2" from guardrail material. Standoff shall be extruded aluminum, alloy 6061-T6
9. Handrails shall have internal sleeves for splice purposes and finished rail shall be continuous and shall not exceed 1-5/8" diameter.

## 2.6 RAMPS

1. Wheel chair accessible ramps with a minimum 60" clear width and a maximum 1:12 slope shall be provided, conforming to code.
2. Understructure shall be constructed of same materials as bleacher support structure.
3. Decking and handrails shall be constructed of same materials as bleacher decking.

## 2.7 MODULAR PRESS BOX SPECIFICATIONS:

1. 8' x 24' Industrialized; Use Group A-5; Construction Type V-B

### a) FLOOR CONSTRUCTION

- 1) Bottom Board:  
1/2" CDX plywood sheathing (painted black)  
Continuous aluminum vent
- 2) Insulation:  
Min. R-19 fiberglass batts, with vapor barrier.
- 3) Joists:  
2" x 6" #2 SPF, on 12" centers, transverse framing.
- 4) Decking:  
3/4" SturdiFloor, underlayment grade, tongue and groove fir plywood, (Index 24" O.C.).
- 5) Covering:  
1/8" Armstrong Excelon vinyl composition tile, Cottage Tan.
- 6) Molding:  
4" vinyl base molding by Roppe.

### b) WALL CONSTRUCTION

- 1) Studs:  
2" x 4", #2 or better SPF, on 16" centers, IBC framing.
- 2) Bottom Plate:  
2" x 4" #2 or better SPF.
- 3) Top Plates:  
(2) 2" x 4" #2 or better SPF.
- 4) Headers:  
As span and design load requires
- 5) Ceiling Height:

8'-0" x 7'10", front to back.

- 6) Covering:  
5/8" vinyl-faced gypsum panels, Class A, F.S.R.
- 7) Insulation:  
Min. R-11 fiberglass batts with vapor barrier.
- 8) Sheathing:  
1/2" CDX plywood  
  
House wrap air infiltration barrier
- 9) Siding:  
Mastic .048 vertical board and batten premium vinyl siding panels.

c) ROOF CONSTRUCTION

- 1) Joists:  
2" x 8", #2 SPF, 16" O.C. spacing or #1 SYP as required.
- 2) Overhang:  
15-1/2" over front wall; 6" over rear wall.  
.019 aluminum fascia with perforated aluminum soffit panels.
- 3) Ceiling:  
5/8" gypsum board, taped and bedded with spray textured finish, Class A F.S.R.
- 4) Insulation:  
Min. R-19 fiberglass batts with vapor barrier.
- 5) Decking:  
3/4" SturdiFloor, underlayment grade, tongue & groove plywood for camera decks (Index 24" O.C.)  
Or  
5/8" CDX plywood sheathing for non-camera decks (Index 20" O.C.)
- 6) Covering:  
.060 single-ply EPDM rubber membrane, fully adhered.

d) WINDOWS

- 1) Lindsay #3300 "Earthwise Series" double horizontal sliders with extruded vinyl frames, AAMA LC-25 structural rating, with 3/4" insulated Low-E, Argon filled tempered glass and removable insect screens.  
Min. U-Value = .29, SHGC = .29

2) Interior windows to be ¼" tempered safety glass fixed pane with stained jambs and casing.

e) DOORS: (Exterior)

"Oakcraft" wood-grain textured insulated fiberglass entry door with solid vinyl jambs; 16" insulated/tempered lite, aluminum threshold, vinyl weather stops, stainless steel knuckle hinges and heavy-duty retention chain. Doors equipped with commercial lever-handled keyed locksets. Min. U-Value = .22

f) DOORS: (Interior)

1-3/8" solid-core stained Birch door with stained Fruitwood Birch wood jambs and casing. Passage lever-handled hardware.

g) ELECTRICAL

1) Service Entrance Panel:

Square D QO112M100 with Main Disconnect; rated at 120/240v, single phase, 100 amp capacity.

2) Switches/Receptacles:

Pass & Seymour #TM870 125 volt/15 amp duplex, spec-grade, switches.

Intermatic #EI500 programmable astronomical timer switches as required.

Lutron #MSOPS5MLA occupancy sensor switches as required.

Pass & Seymour #3232 125 volt/15 amp duplex, spec-grade, receptacles.

Wiremold 5400 Series two-piece multi-channel, dual voltage, non metallic surface raceway along front wall below scorer's counter, outlets on 48" centers.

Conduit prep and circuitry for customer's PA and DATA systems

3) Lighting:

Interior: SATCO #45/LED/1X4/FLUSH/3K/WH 45 watt, 30K LED 1X4 surface mounted LED light.

Exterior: SATCO #S9014 4" (7 watt) 4000K LED recessed light

Emergency/Exit: Lithonia ECR-REM-LED emergency combination exit/flood light with 90 min. battery back-up and ERE-SLG-WP LED remote emergency flood light

- 4) Circuits:  
All branch circuit wiring is minimum #12 THHN copper wire encased in EMT thin-wall conduit or MC cable.
- 5) HVAC  
GE Zoneline 4100 series packaged terminal HVAC units with integral thermostats.
- h) SCORER'S COUNTER  
18" deep x 3/4" lauan grade plywood with 1-1/2" x 2" edge, surfaced with .060 plastic laminate by Nevamar.
- i) CAMERA DECKS
  - 1) Hatch:  
Bilco Model NB50 2'6" x 4'6" aluminum roof hatch.
  - 2) Ladder (Aluminum):  
Alaco Model H70 70-degree ships ladder.
  - 3) Roof Surface:  
Dec-K-ing .060 polyester reinforced skid and spike resistant PVC membrane, fully adhered.
  - 4) Railing mounts:  
1/2" galvanized threaded bolts & nuts through roof fascia on 48" centers along perimeter edge of roof.
- f) MISCELLANEOUS  
10 LB. dry chemical fire extinguisher.  
Rated 4-A: 20-B:C

## **PART 3 – EXECUTION**

### **3.1 EXAMINATION**

Before erection proceeds, certified bleacher and press box installer will survey elevations and locations of concrete pads or runners to verify compliance with requirements and manufacturer's tolerances.

### **3.2 ERECTION**

- A. Erect bleacher system and Press Box system according to manufacturer's written instructions and erection drawings.
- B. Do not field cut, drill or alter structural members without written approval from bleacher system manufacturer's professional engineer.
- C. Set structural framing in locations as indicated.

### **3.3 CLEANING AND PROTECTION**

- A. Clean all metal surfaces promptly after installation of work.
- B. Exercise care to avoid damage to protective coatings and finishes.
- C. Remove all excess construction material and dispose of all debris.

END OF SECTION

# MECHANICAL SPECIFICATIONS 15000



## SECTION 15100 - MECHANICAL GENERAL REQUIREMENTS

### PART 1 - GENERAL

#### CONDITIONS AND REQUIREMENTS

The General Conditions, Supplementary Conditions, and Division-1, General Requirements apply to this section.

#### GENERAL PROVISIONS

The contract drawings indicate the extent and general arrangement of the work. The Contractor shall be responsible for installing the proposed systems as indicated, without violation of applicable codes, standards, or specification requirements. The Contractor is also responsible for coordinating the installation and operation of these systems with the other sections of this specification to provide a complete and operable system. Equipment, piping, and ductwork arrangements shall fit the space as indicated and shall allow adequate and approved clearance for entry, servicing and maintenance. Detailed drawings of any proposed departures due to actual field conditions shall be submitted to the Architect for approval. All work shall conform to the requirements of the referenced publications and as specified herein.

#### CONFORMANCE WITH AGENCY REQUIREMENTS

Where materials or equipment are specified to conform to requirements of the Underwriters' Laboratories, Inc., Factory Mutual Systems, Air Conditioning and Refrigeration Institute, Air Diffusion Council, American Society of Heating, Refrigerating and Air Conditioning Engineers, or the Air Moving and Conditioning Association, Inc., the Contractor shall submit proof of such conformance. The label or listing of the specified agency will be acceptable evidence. In lieu of the label or listing, the Contractor may submit a written certificate from any approved, nationally recognized testing organization adequately equipped and competent to perform such services, stating that the items have been tested and that the units conform to the requirements, including methods of testing, of the specified agency. Where equipment is specified to conform to requirements of the ASME Boiler and Pressure Vessel Code, the design, fabrication, and installation shall conform to the code in every respect.

#### CAPACITIES

Capacities of all equipment and material shall be not less than those indicated, nor exceed maximum values shown on the drawings. Physical dimensions of equipment shall be verified against contract documents to insure manufacturer's maintenance space is available.

#### EQUIPMENT INSTALLATION

Necessary supports shall be provided for equipment, appurtenances, pipe, and ductwork as required. Isolation vibration units shall be provided to minimize the intensity of vibration transmission to the building structure where required.



## ELECTRICAL WORK

Electric-motor-driven equipment specified herein shall be provided complete with motors and controls. Electric equipment and wiring shall be in accordance with Division 16000, "Electrical Work". Electrical characteristics shall be as indicated. Each motor shall be of sufficient capacity to drive the equipment at the specified capacity without exceeding the nameplate rating of motor when operating at proper electrical system voltage. Manual or automatic control and protective or signal devices required for the operation herein specified and any control wiring required for controls and devices, but not shown on the electrical plans, shall be provided under this section.

## APPROVAL OF MATERIALS AND EQUIPMENT

After notice to proceed and before purchasing, the Contractor shall submit to the Architect for approval, five bound copies in 3-ring binders, a list of materials he proposes for the work. Items to be submitted include, but are not limited to, the items listed in each individual section. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's names, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, industry, and technical society publication references, and other information necessary to establish contract compliance of each item the Contractor proposes to furnish.

Shop Drawings: Drawings shall be a minimum of 8 1/2" x 11" in size, except as specified otherwise.

Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. All equipment selections shall be clearly marked with name designations as shown on drawings (i.e., AHU-1, HPU-2, etc.). Where manufacturer's data includes equipment of differing sizes and/or capacities, the Contractor shall clearly indicate what specific model and/or size is to be used.

Delivery and Storage: Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Architect. Damaged or defective items, in the opinion of the Architect, shall be replaced.

Cataloged Products: Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest design that complies with the specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use at least 2 years prior to bid opening. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer.

## NAMEPLATES

Each major item of equipment shall have the manufacturer's name, address, serial and model numbers on a plate securely attached to the item.

## VERIFICATION OF DIMENSIONS

The Contractor shall visit the premises to thoroughly familiarize himself with all details of the work and working conditions and verify all dimensions in the field, and shall advise the Architect of any discrepancy before performing any work. The Contractor shall be specifically responsible for the coordination and proper relation of his work to the building structure and to the work of all trades.

## DRAWINGS

Because of the scale of the drawings, it is not possible to indicate all offsets, fittings, and accessories that are required. The Contractor shall carefully investigate the structural and finish conditions affecting his work and he shall furnish fittings, offsets, transitions, unions, etc., as may be required to meet such conditions at no additional cost to the Owner.

## CUTTING AND REPAIRING

The work shall be carefully laid out in advance and no excessive cutting of construction will be permitted. Damage to building, piping, wiring, or equipment as a result of cutting for installation shall be repaired by mechanics skilled in the trade involved at no additional expense to the Owner.

## SAFETY REQUIREMENTS

Belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High-temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified herein. Items such as catwalks, ladders, and guard rails shall be provided where required for safe operation and maintenance of equipment.

## MANUFACTURER'S RECOMMENDATIONS

Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Architect prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

## PAINTING

At the completion of all work, all equipment on this project shall be checked for damage, and any factory finished paint that has been damaged shall be repaired to match the adjacent areas. Any metal or especially covered areas that have been deformed shall be replaced with new material and repainted to match adjacent areas. Painting of new work shall be as specified herein.

## FINAL CLEANUP

At the completion of all work, all equipment on the project shall be checked and thoroughly

cleaned, including coils, plenums, under equipment, and any and all other areas around or in equipment. Any filters used during construction shall be replaced with new filters during final cleanup.

## OPERATING AND MAINTENANCE INSTRUCTIONS

Bound Instructions: Three (3) complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished to the Architect before the contract is completed. Each set shall be permanently bound and shall have a hard cover. The following identification shall be inscribed on the covers: The words "Operating and Maintenance Instructions", the name and location of the building, the name of the Contractor and the contract number. Flysheet shall be placed before instructions covering each subject. The instruction sheet shall be approximately 8 1/2" x 11", with large sheets of drawings folded in. The instructions shall include, but shall not be limited to, the following:

Approved wiring and control diagrams, with data to explain the detailed operation and control of each component.

A control sequence describing start-up, operation and shutdown.

Operating and maintenance instructions for each piece of equipment, including lubrication instructions.

Manufacturer's bulletins, cuts and descriptive data.

Parts lists and recommended spare parts.

END OF SECTION 15100

## SECTION 15200 - TESTING AND BALANCING AIR DISTRIBUTION SYSTEMS

### PART 1 - GENERAL

#### GENERAL REQUIREMENTS

The General Conditions, Supplementary Conditions and Division 1, General Requirements, apply.

#### QUALITY ASSURANCE

Testing Agency:

Submit name, address, and qualifications of testing agency to Architect for approval prior to start of testing.

All system adjustments and test and balances are to be performed by a company regularly and exclusively engaged in this work. Agency shall be a member in good standing of the Associates Air Balance Council (AABC).

Procedures shall be as outlined in the AABC Publication 716-79 for total system balance.

#### SUBMITTALS

Test Reports: After completion, submit three (3) certified copies of test and balance report to the Architect for review and as a project record document.

#### JOB CONDITIONS

Commencement of Test: Do not begin balancing until the systems have been completed and are in full working order, or at the direction of the Architect, place any part thereof in operation for the purpose of balancing.

Plans and Data: Furnish the balance agency one (1) complete set of all approved up-to-date mechanical plans and shop drawings of all cooling, heating, air, and water distribution equipment.

#### FIELD QUALITY CONTROL

Performance Data: Record the following data and submit to the Architect.

Air Volumes and Velocities: Determine and tabulate at each grille, diffuser, louver, outside air intake, etc., and adjust dampers, control devices and fan drives to obtain the indicated air quantities. Adjust or modify each supply grille and diffuser distribution pattern as required to maintain air motion, noise level and temperature variations within acceptable limits throughout each space. Clearly and permanently mark all dampers at final setting for reported air balance.

System Component Capacity: Record and calculate all data necessary to demonstrate

capacity under actual operating conditions, and adjust dampers, and machine drives to obtain a suitable operating balance for each system. Record data for each item of equipment simultaneously with data from all associated equipment together with coincident outside air dry bulb temperatures to permit evaluation of total system performance. Data to include the following:

Supply, return and outside air quantities for each air conditioning and ventilation system.

Air volumes and velocities for each fan, cooling coil and air cleaning assembly.

Entering and leaving air dry bulb and wet bulb temperature for each cooling and heating coil.

Static pressures for all air handling units and major fans.

Actual voltage and current input for each motor.

Test and adjust each diffuser grille, and register within 10 percent of design requirements. Test and record temperature rise, voltage, and current across duct heaters.

In readings and test diffusers, grilles and registers include required fpm velocity and test fpm velocity, and required cfm and test cfm after adjustments.

### TEMPERATURE CONTROLS

Set adjustments of all controllers to operate as indicated. Make four hour temperature traverse of each area or zone. Provide testing agency personnel with instruments to verify reports to Architect.

### FINAL TEST

At conclusion of testing agency's work, demonstrate to the Architect that the equipment is mechanically sound, that the systems deliver the rated output without objectionable noise, distress or vibration, and that the temperature controls are functioning properly.

END OF SECTION 15200

## SECTION 15400 - PLUMBING

### PART 1 - GENERAL

#### SCOPE OF WORK

The work to be performed under this section of the Specification shall include all labor, materials, equipment, transportation, construction, facilities, and incidentals necessary for the proper execution and completion of all Plumbing work as shown and indicated on the Contract Drawings, and/or specified herein with the intent that the installation shall be complete in every respect and ready for use. The work required under this section of the specification shall include specifically, but is not limited to the following:

Cold water piping and connections to new fixtures as shown or indicated on the drawings.

Hot water supply piping, including connections to new fixtures, as shown or indicated on the drawings.

A system of sanitary soil, waste, and vent piping including connections to existing services, and new fixtures as shown or indicated on the drawings.

A system of thermal insulation for all new potable water piping.

All fixtures and equipment as hereinafter specified, completely installed and operational.

All necessary cutting and/or core drilling to install plumbing systems in this section.

#### RELATED DOCUMENTS

Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 1 specification sections apply to work specified in this section.

#### GUARANTEE

All materials and equipment provided and/or installed under this section of the specifications shall be guaranteed for a period of one year from the date of acceptance of the work by the Owner. Should any trouble develop during this period due to defective materials or faulty workmanship, the Contractor shall furnish all necessary labor and materials to correct the trouble without any cost to the Owner. Any defective materials or inferior workmanship noticed at the time of installation and/or during the guarantee period shall be corrected immediately to the satisfaction of the architect.

#### CODES AND REGULATIONS

All work performed under this section shall conform with all local governing regulations, and in case of conflicting requirements, the most stringent shall apply. Minimum requirements shall be the International Building Code. All electrically operated equipment specified in this section shall comply with the National Electrical Code.

Should it be found that any part of the work shown or specified is not in accordance with local regulations, the Architect shall be so advised at the time of bidding and all work installed as required to meet the local codes.

The Contractor shall comply with the latest revisions of all county, district, municipal, or local building codes, interpretations, buildings permits to include but not be limited to:

2021 International Building Code  
2021 International Mechanical Code  
2021 International Plumbing Code  
2010 ADA Standards for Accessible Design  
NFPA-101 - Life Safety Code  
Local Municipal Codes  
National Electrical Code (NFPA 70)

### FEES AND PERMITS

The Plumbing Subcontractor shall obtain and pay for all permits, fees for inspection, and other charges that may be necessary for fully completing the work. The Plumbing Subcontractor shall make all necessary tests required by City, County, or State authorities, legal regulations, and/or the Architect, and return to the Architect any certificates of approval issued in this district for plumbing work, etc. signed by the inspector in charge of each particular part of the work.

### RECORD DRAWINGS

Contractor shall keep a set of reproducible drawings on site at all times and log all changes made during construction period. No deviations from the drawings and specifications shall be made without full knowledge and consent of the Architect. Record drawings shall show dimensions, locations, and depth of all buried and concealed piping, plugged outlets, and equipment, and shall keep up-to-date. No plumbing progress payments will be approved unless as-built drawings are up-to-date. Upon completion of work, sepias shall be turned over to the Architect.

### COOPERATION

The Contractor shall lay out and proceed with his work so that this work will be executed in harmony with all other contractors and trades on the job.

### VISITING THE PREMISES

The Contractor, before submitting his bid on the work, must visit the site and familiarize himself with all existing conditions. As a result of having visited the premises, the Contractor shall be responsible for the installation of the work as it relates to such existing conditions. The submission of a bid will be considered an acknowledgment on the part of the bidder of his visitation to the site.

### VERIFICATION OF CONTRACT DRAWINGS

The drawings and specifications are intended to cooperate. Any materials, equipment, or systems related to this section and exhibited on the architectural and plumbing drawings, but not mentioned in the specifications are to be executed to the intent and meaning thereof, as if it were both mentioned in the specification and set forth on the drawings. Where the Contractor finds the specification and/or drawings to be in conflict or where they are not clear, same shall be brought to the attention of the Architect prior to submitting a bid.

The plans indicate the general arrangement of the existing utilities. The locations of piping are approximate for clarity. Exact locations shall be determined in the field by the Contractor. In the event it should become necessary to change the locations of any work due to building construction, etc., the Contractor shall secure the approval of the Architect before making the changes. Any changes approved by the Architect shall be made without added cost to the Owner. Under no circumstances shall the sizes indicated on the drawings be changed without securing written approval of the Architect.

The drawings are diagrammatic and do not necessarily show or indicate all fittings, offsets, and accessories which may be required. The Contractor shall carefully investigate the structural and finish conditions affecting all his work as well as the operational requirements of each system and shall arrange such work accordingly, furnishing such fittings, etc., as may be required for the proper and efficient functioning of each system. No unnecessary or unauthorized offsets will be permitted.

#### WORKMANSHIP

All workmanship performed under this section shall be executed in a first class manner in accordance with the best practices of the trade. The Architect reserves the right to accept or reject workmanship and determine when the Contractor has complied with the requirements herein specified. Only competent mechanics skilled in their respective trades shall be employed by the Contractor.

#### RESPONSIBILITY OF BIDDER

Each bidder shall visit the site of the proposed work and fully acquaint himself with conditions relating to the construction requirements so that he may fully understand the facilities, difficulties and restrictions contingent upon the execution of the work under this contract. The failure or omission of any bidder to receive or examine any form, instrument, addendum or other document shall in no way relieve any bidder from his obligations with respect to his bid or the contract. The submission of a bid shall be taken as prima facie evidence of compliance with this paragraph and that he has included in his proposal every item of cost necessary for a complete installation of air conditioning, heating and ventilation operations strictly as planned, specified, and intended.

#### NOISE AND VIBRATION

This Contractor shall be held responsible for elimination of all noises or vibrations transmitted to occupied areas from equipment which he may install. This applies particularly to vibration and noises in piping. He shall furnish and install water hammer arrestors, flexible connectors for piping, etc., as may be necessary.



## SUBMITTAL DATA

Materials and equipment schedules shall be submitted as soon as practicable, but not later than 30 days after the date of award of contract, and before commencement of installation of any material or equipment. A complete schedule of the material and equipment proposed for installation shall be submitted in proper binders (3-ring or fastener type), properly marked for approval by the Architect. The schedule shall include catalogs, cuts, diagrams, drawings, specifications and such other descriptive data as may be required by the Architect. The schedule and supplementary data shall be submitted in six (6) copies, and approval obtained. All materials required to be submitted for approval under this section shall be submitted at one time.

Partial submittals will not be considered. Each item submitted shall be identified by its applicable drawing number.

Where equipment named as equivalent or approved equal are proposed for use by the Contractor, he shall be responsible to coordinate any changes with all trades affected.

The following equipment and material shall be submitted for approval:

- Valves
- Cleanouts
- Access Panels
- Piping and materials
- Insulation
- Plumbing fixtures, including traps, supplies, and carriers
- Water Hammer Arrestors
- Floor Drains
- Trap Primers
- Water Heaters

## START-UP SERVICE

The Contractor shall put all items installed under this section into operation and shall instruct the Owner's maintenance personnel in all points requiring service and maintenance. Further, the Contractor shall make all adjustments and/or service requirements to said equipment during the first 60 days of actual occupancy.

## PIPING

Provide pipe sleeves through masonry construction, and install escutcheon plates around exposed piping in all rooms.

Soil, waste and vent lines shall be Schedule 40 PVC-DWV in accordance with Commercial Standards CS272-65 or ASTM Standards D2665-68. Soil, waste, and vent lines penetrating a fire rated wall or floor shall be service weight cast iron at the point of penetration only.

All plastic pipe shall bear the NSF Seal of Approval, and such other markings as required by the aforementioned standards.

Above slab cold water and hot water piping shall be Type "L" hard copper with sweated joints, using wrought fittings and non-corrosive flux. Below slab cold water piping shall be type "K" soft copper tubing.

Waste piping serving within the first thirty feet of areas where temperatures may be expected to exceed 140 degrees F shall be Spears® LabWaste™ CPVC piping or equal. Soil, waste, and vent systems penetrating a fire rated wall or floor shall be cast iron soil pipe. Below grade installation of thermoplastic pipe shall be installed in accordance to the ASTM D 2321\* standard. \* most current edition

Where pipes pass through firewalls, fire partitions, or fire rated floors, an approved UL Fire Seal shall be provided. System employed shall be assigned an approval number in accordance with 1990 Fire Resistance Directory published by Underwriters' Laboratories.

### PIPE SUPPORT

Hangers: Support all suspended piping with clevis type hangers equal to Piping Technology and Products Fig. 83, 5'-0" o.c. When attached to open-web bar joists, the hanger shall be supported from both chords at the same time. The hanger is preferred to pass between the chords, not attached to the webbing member, and supported on top of the chords. This is a concentric application. Architect shall approve all methods of attachment of hangers to construction. Hangers in contact with copper piping shall be copper, or copper plated. Within the storm shelter area, hangers shall be installed at 2'-6" o.c and piping shall be appropriately braced.

Vertical Support: Steel bar base clamped to pipe or grip strut channel with offset clamps. Support members to be of same material as supported material where possible.

All anchorage shall be to studs or solid blocking built into the wall. No plumbing straps shall be used.

### PIPING PLACEMENT

Place in most direct manner permitted by construction, free of unnecessary offsets, making changes in direction by means of standard fittings.

Grade 2" waste lines 1/4" per foot and 3" and 4" waste lines 1/8" per foot for positive flow. Secure all piping to structure.

Changes in direction of drainage pipe shall be made by means of suitable bends and branches of Y's and long sweeps. Short radius quarter bends are prohibited. Make no change in direction of flow greater than 90°. Where different sizes of drainage pipes or fittings are connected, use standard increasers and reducers of proper size. Do not reduce size of drainage piping in direction of flow. Drilling and tapping of house drains, soil waste or vent pipes, and use of saddle hubs and bands are prohibited.

### Waste Arms

Type "K" copper or IPS brass pipe typical; Alloy steel or IPS brass pipe at urinals.

#### Test Fittings

Not shown on the drawings; provide where required for partial tests. Provide test tees at base of all stacks.

Hand holes with brass ferrules and brass trap screws for cleanouts shall be placed at ends of soil and waste pipe and where otherwise shown on plans or as required on job. Cleanouts to be brought flush with face of walls. All threaded plugs shall be full size of pipe on which placed up to 4".

#### Soil Pipe

Support to firm earth below floor slabs.

Changes in direction of drainage pipe shall be made by means of suitable bends and branches of Y's and long sweeps. Short radius quarter bends are prohibited.

Connections of vertical soil pipe to all connections in horizontal soil pipe to be made by "Y" fittings.

#### Vent Pipes

Main soil pipe stacks to be extended up through the building full size with increaser through roof per code.

Connect branch vents into main stacks with connections not less than 4 feet above the highest fixture.

All vent stacks shall be connected at the bottom to main drainage system and all horizontal runs shall be graded so as to discharge all water or condensation.

#### Water Piping

Place supply pipes as shown or as directed in neat arrangement and parallel or at right angles to walls, joists, etc.

Place shock absorbers at each fixture group as recommended by manufacturer. Shock absorbers shall be PDI certified.

Place valves on all water pipe risers and branch lines at point where risers and branch lines connect to main water lines.

### PART 2 – PRODUCTS

#### WATER PIPING

All water piping, unless otherwise shown or specified shall be copper pipe Type L or K as specified having a wall thickness of not less than .035 inches. It shall be clean, round, straight, and true to size, free from flaws and other defects.

All fittings on copper pipe shall be copper. The pipe and fittings shall be thoroughly cleaned before inserting into the joint and then soldered with lead free solder.

## UNIONS

Unions shall be provided on inlet and outlet of all apparatus and equipment. Where valves are adjacent to equipment, unions shall be between valves and equipment.

Unions in copper pipe shall be cast bronze, WOG pattern, ground joint, 150 psi type.

Unions in steel pipe shall be malleable iron, WOG female pattern brass seat, ground joint, 150 psi type.

Unions connecting dissimilar metals shall be dielectric type.

## TRAP PRIMER DISTRIBUTION UNIT

Zurn Z1072 barrier trap seal or equal to be provided for all floor drains in lieu of trap primer. Unit shall be installed per manufacturer's instructions.

## VALVES AND COCKS

Valves and cocks shall be installed where shown on the drawings, and/or where found to be necessary for proper operation of the system. All branches from risers, all branches from mains, and all fixtures or equipment not having stops shall be provided with valves whether shown or not.

Angle or straightway chromium plated stops on the supplies to all fixtures accessible from the same room in which the fixtures are located.

All valves shall be the product of one manufacturer as cataloged by Milwaukee, Stockham, Crane, or Nibco.

For water piping, valves shall be equal to 125 psi SWP/200 psi WOG Nibco as follows:

Gate valves 1/2" to 3" = S-111.

Ball valves 1/2" to 2" = S-585.

Check valves 1/2" to 3" = S-413W.

## WALL HYDRANTS

Interior wall hydrants shall be encased, anti-siphon, automatic draining, keyed with nickel bronze face plate. Mount flush with wall. Wall hydrant shall be equal to Zurn Z-1325. Coordinate wall thickness at installation location. Adjust location as necessary to enclose piping within the wall.

Exterior wall hydrants shall be encased, anti-siphon, automatic draining, non-freeze, with nickel bronze faceplate, keyed hinged cover. Wall hydrant shall be equal to Zurn Z-1322-EZ. Coordinate wall thickness at installation location. Adjust location as necessary to enclose piping within the wall.

## THERMAL INSULATION WORK

All insulation work shall be performed by experienced insulation application mechanics

thoroughly familiar with and experienced in the application of insulation materials. All insulation materials shall be applied in accordance with manufacturer's published recommended methods. Installation and finish of insulation materials shall meet with complete data for approval of materials and application methods as proposed for use. All piping shall be pressure tested and all surfaces shall be thoroughly cleaned before covering is applied. Insulation materials, including sealer, adhesive, finished, etc., shall meet NFPA Standards with regard to flame spread and support of combustion.

All domestic cold water piping and all hot domestic water piping less than 1-1/2" in diameter shall be covered with 1" thick heavy density fiberglass sectional pipe insulation equal to Owens Corning Fiberglass 25 ASJ/SSL, excluding piping below grade or chromium plated fixture connections. All hot domestic water piping 1-1/2" in diameter or larger shall be covered with 1-1/2" thick heavy density fiberglass sectional pipe insulation equal to Owens Corning Fiberglass 25 ASJ/SSL, excluding piping below grade or chromium plated fixture connections. All piping inside masonry walls shall be insulated; no exceptions. Armaflex type insulation shall be allowed only before building is dried-in in those locations which will be inaccessible for the installation of the aforementioned fiberglass insulation. All exposed hot and cold water piping shall be labelled as required by ASME A13.1.

Fittings for the above shall be insulated with premolded fitting insulation of the same material and thickness as the adjacent insulation and shall be covered with a premolded plastic (PVC) vapor barrier and sealed with vapor barrier lagging adhesive. Covering adjacent to unions and other points of termination shall be finished with the plastic material neatly beveled.

It shall be the responsibility of the insulation subcontractor to coordinate hanger locations and prevent crushing or breaking finishes. Provide saddles with blocking as necessary.

Contractor shall insulate hot water supply assembly and P-Trap assembly with insulation kit equal to Brocar or Trubro on handicapped lavatories.

#### FLOOR, WALL, AND CEILING PLATES

Nickel plated floor, wall, and ceiling plates shall be provided on all pipes passing through floor, ceiling, or partition. Nickel or chromium plated escutcheons shall be provided on all fixture supplies.

#### PLUMBING FIXTURES AND EQUIPMENT

Provide roughing-in for and connect to supply lines, waste and vent lines, all equipment, fixtures, drains, etc., specified herein or in other sections of the specifications which require such connections.

Provide stops in hot and cold water upstream of connections to each fixture, equipment items, etc. Where not otherwise specified, stops shall be same as specified hereinbefore for ball valves. Provide deep escutcheon on all sinks and lavatories where waste pipe goes into wall. Anchor all supplies from wall securely within wall construction.

Provide stops for all fixtures. Traps for all fixtures shall be 17- gauge chromium plated brass.

Plumbing fixtures shall be equal to American Standard, Crane, Kohler, Just, Elkay or Eljer. Faucets and valves shall be equal to Sloan, Zurn, Delta, American Standard, Kohler, Just or T&S Brass. No others will be accepted.

Plumbing fixtures shall be as follows:

- P-1 WATER CLOSET: Kohler K-4406 elongated bowl, floor mounted, floor outlet, flush valve type with Sloan Royal 111 flush valve. Provide Olsonite 10SSC white open front seat (less cover) and two bolt caps.
- P-1A HANDICAP WATER CLOSET: Kohler K-4368, 17-1/2" high elongated bowl, floor mounted, floor outlet, flush valve type with Sloan Royal 111 flush valve. Provide Olsonite 10SSC white open front seat (less cover) and two bolt caps. Install per ADA requirements.
- P-2 URINAL: Kohler K-4960-ET, wall hung, vitreous china with Sloan Royal 186 - 1.0 flush valve and Zurn Z1222 wall carrier.
- P-2A HANDICAP URINAL: Kohler K-4960-ET, wall hung, vitreous china with Sloan Royal 186-1.0 flush valve and Zurn Z1222 wall carrier. Mount fixture in compliance with ADA for handicap use.
- P-3 LAVATORY: Kohler K-2005, 20" x 18" wall hung vitreous china with Delta 505 single lever faucet and grid waste. Bowl depth not to exceed 5-1/2". Provide 1-1/4", 17-gauge P-Trap, flexible supplies equal to Brasscraft, stops, Leonard model 170 thermostatic mixing valve, and Zurn Z1231 concealed arm carrier. Provide insulation kit on all exposed piping.
- P-3A HANDICAP LAVATORY: Kohler K-2005, 20" x 18" wall hung vitreous china with Delta 505 single lever faucet and grid waste. Bowl depth not to exceed 5-1/2". Provide 1-1/4", 17-gauge P-Trap, flexible supplies equal to Brasscraft, stops, Leonard model 170 thermostatic mixing valve, and Zurn Z1231 concealed arm carrier. Install per ADA requirements. Provide insulation kit on all exposed piping.
- P-4 HANDICAP EXTERIOR WATER COOLER: Dual unit, barrier free, Elkay VRCTLFR8SC, wall hung, freeze resistant, vandal resistant with front push-button control. Provide with 1-1/2" 17-gauge P-Trap, rough brass stop, and Zurn Z-1225 wall hanger. Mount in compliance with ADA for handicap use.
- P-4A HANDICAP INTERIOR WATER COOLER: Dual type, wall mounted, barrier free, Elkay LZSTL8WSSP with 17-gauge P-Trap and rough brass stop. Provide with Zurn Z-1225-BL floor-supported plate carrier and mount in compliance with ADA for handicap use. Unit to have bottle-filling station on lower side.

P-5 MOP SINK: 24" x 24" x 12", terrazzo, Fiat TSBC-1610 with Fiat 830-AA wall mounted faucet with hose, 889CC bracket, vacuum breaker, stainless steel bumper guard, and stainless steel wall splash guards. Unit shall be provided with 3" drain.

Floor Drains (Typical locations) Zurn ZN-415S Series with polished nickel bronze, square heel-proof strainer and adjustable collar. Floor drains shall be provided with trap primer tap as indicated on plans. (for AHU drainage) Zurn ZN-415I Series with nickel bronze top and "Type I" polished nickel bronze strainer with raised flange. Floor drains shall be provided with trap guard device, (or equal), as indicated on plans. Floor drains shall be provided with trap primer tap or trap guard device where indicated on plans.

### CLEANOUTS

Provide in cast iron sanitary piping at all changes in direction at ends of branches, at intervals not exceeding 40' on straight runs, and elsewhere as shown. Cleanouts shall be full opening type completely accessible. Size same as lines in which they occur, but not larger than 4". Tees and extensions shall be of same weight as pipe. Plugs shall be countersunk type. Catalog numbers from Josam or approved equal.

Outside cleanouts to grade shall be brought up flush with finished grade and installed in 18" x 18" x 6" concrete pad, cleanout plug shall be countersunk.

In Tile Floors: 56030-2, adjustable, cast iron body with ABS plug and satin finished square scoriated Nikaloy top; where soft tile occurs, provide 56030-12-2 recessed square Nikaloy cover.

In Concrete Floors: 58190, adjustable head, cast iron head and ferrule with ABS plug, round loose set scoriated tractor cover.

In Outside Line: 58190 cast iron head and ferrule with ABS plug. Terminate at grade or pavement in 18" x 18" x 6" concrete pad with tooled edges.

In Finished Walls: 58790 cast iron cleanout tee with ABS plug and stainless steel wall plate cover. Where distance from plug to finish wall will exceed 4", provide 58710 extend cover from sanitary tee to bring plug within 4".

In Quarry Tile Floors: 56040-13-1, adjustable cast iron head and ferrule, ABS plug and round brass terrazzo cover and rim.

### ELECTRIC TANK-TYPE WATER HEATERS

Provide electric water heater with high efficiency stainless steel sheathed elements which comply with ASHRAE Standard 90-75. Water heaters shall have capacity as scheduled and shall be equal in all respects to Rheem. Provide with 3" diameter thermometer gauge on discharge line, auxiliary drain pan, T&P relief valve, expansion tank, and vacuum breaker.

Provide Watts 100XL temperature and pressure relief valve, Watts N36 vacuum relief

valve, galvanized drain pan, and 5-year warranty on tank. See schedule for electrical characteristics.

If the water heater has a storage capacity over 120 gallons or a heating rate of 56kW or greater, a boiler installation permit must be obtained from the State of Alabama Department of Labor. The heater installation and piping must also be inspected and approved by the State of Alabama Department of Labor.

### PART 3 - EXECUTION

#### COMPLETION OF WORK

This Contractor shall arrange for the installation of all equipment in order that it progresses along with the general construction of the building, and in no case shall be hold up other phases of the work due to the fact his equipment is not properly installed.

#### TESTING

General: Perform all tests in the presence of the Architect or his representative. Test shall conform to local code requirements. File copies of all test reports in duplicate to physical plant.

Soil, Waste, and Vent Systems: Plug all openings, fill entire system with water to point of overflow and hold for at least one hour before inspection. System must remain full during the test without leakage. Each vertical stack with its branches may be tested separately, but any portion tested must have a 10' head. Provide test tees and plugs for all tests as required.

Drainage and Vent Systems final test. Fill all traps with water and then introduce into the entire system a pungent, thick smoke produced by one or more smoke machines. When the smoke appears at stack openings on the roof, the stack openings shall be closed and a pressure equivalent to a one-inch water column shall be held for a test period of not less than 15 minutes. The plumbing contractor shall provide all materials, equipment and labor to perform this testing.

Water Supply System: Test and secure acceptance of entire system before the piping or hot water heaters are otherwise concealed. Test as follows: Disconnect and cap all outlets to plumbing fixtures and all other equipment not designed for the full test pressure. Fill the system with water; apply 150 psi hydrostatic pressure and hold until inspection is completed. All piping throughout shall be tight under test. Water piping shall remain under normal water pressure during construction where freezing conditions do not exist.

#### DISINFECTION

Disinfect all domestic water piping in accordance with local health department guidelines.

END OF SECTION 15400



## SECTION 15800 - HEATING, VENTILATION, AND AIR CONDITIONING

### PART 1 - GENERAL

#### SCOPE OF WORK

The work consists of furnishing all labor, materials and incidentals necessary for a completely functional system. In general, the work shall include, but not necessarily be limited to the following major subdivisions.

Ductwork, grilles, and diffusers

Insulation

Packaged air conditioning units with hot gas reheat and gas fired heating furnace

Wall mounted packaged heat pump units

Exhaust fans

Louvers

Electric unit heaters

Dampers

Air purification device (bi-polar ionization)

#### CODES, FEES, PERMITS

The Contractor shall comply with all county, district, municipal, or local building code, interpretations, building permits and assessments of fees for building permits, and ordinances.

The Contractor shall obtain and pay for all required permits, inspections, and certificates of inspection. Certificates of inspection shall be delivered to the Architect upon completion of the job.

The Contractor shall comply with the latest revisions of all county, district, municipal, or local building codes, interpretations, buildings permits to include but not be limited to:

ASHRAE, "HVAC Systems and Equipment" - Chapter 19, Duct Construction

SMACNA Standards for Duct Construction

International Building Code - 2021

International Mechanical Code - 2021

International Plumbing Code - 2021

ASHRAE 90.1

ASHRAE 62.1

NFPA-90A - Installation of Air Conditioning and Ventilation Systems

NFPA-101 - Life Safety Code

Local Municipal Codes

#### RESPONSIBILITY OF BIDDER

Each bidder shall visit the site of the proposed work and fully acquaint himself with conditions relating to the construction requirements so that he may fully understand the facilities, difficulties, and restrictions contingent upon the execution of the work under this

contract. The failure or omission of any bidder to receive or examine any form, instrument, addendum, or other document shall in no way relieve any bidder from his obligations with respect to his bid or the contract. The submission of a bid shall be taken as prima facia evidence of compliance with this paragraph and that he has included in his proposal every item of cost necessary for a complete installation of air conditioning, heating and ventilation operations strictly as planned, specified, and intended.

### SUB-DIVISIONS OF WORK

Each sub-division of work includes furnishing and installing all materials to make that part of work complete, and shall comprise all auxiliaries, setting of equipment, sleeves through building construction where required and etc., all in complete coordination with General Contractor and in cooperation with other trades. It is contemplated that all sub-divisions of work when completed will form heating, air conditioning, and ventilation system for this project.

### DRAWINGS

The drawings for the Heating, Ventilating and Air Conditioning for this job are diagrammatic. The Contractor shall make his own measurements at the site and in the building during construction and install the systems as the work progresses in such a manner that the equipment, piping, conduit, panels, and ductwork will fit into the finished space provided while maintaining headroom; and be neatly installed. All equipment and its interconnecting piping, ductwork, conduit, etc., shall be provided.

Due to differences between various manufacturers, it is not practicable to show exact dimensions of units, nor to show or specify all minor details of equipment. Contractor shall provide all valves, fittings and accessories as necessary for a complete installation, whether or not specifically mentioned or shown.

Equipment shall not be acceptable if operated in excess of the recommended and published ratings of the manufacturer.

### FOUNDATIONS

The Contractor shall furnish all special foundations and supports for equipment, ductwork and piping which he installs and which are separate and distinct from building construction as shown by Architectural drawings.

### SAFETY PROVISIONS

Contractor shall be required at all times to perform his work in strict accordance with the Williams-Steiger Occupational Health and Safety Act of 1970.

Equipment with any projecting or rotating parts shall be totally enclosed or properly guarded.

### NOISE AND VIBRATION

This Contractor shall be held responsible for elimination of all noises or vibrations transmitted to occupied areas from equipment which he may install. This applies particularly to airborne noises in ductwork, vibration and noises in piping, and vibration from mechanical equipment transmitted through bases to building structure.

This Contractor shall furnish and install all flexible connectors for ductwork connected to motor driven equipment.

Contractor shall closely coordinate work for location of mechanical equipment and roof openings.

### MOTORS AND STARTERS

This Contractor shall be responsible for the furnishing in place of all electric motors required for the operation of all heating, ventilating and air conditioning equipment. Electrical Contractor to provide all power wiring and conduit required for the operation of electrical motors as specified. Electric motors shall be selected in sizes as required to properly operate the equipment furnished but in no case smaller than those indicated on Equipment Schedules. Verify all electrical characteristics from electrical drawings before releasing motors for shipment. Electric motors shall have a service factor of 1.15 and power factor in accordance with ASHRAE 90-75.

This Contractor shall furnish all magnetic motor starters required to operate heating, ventilating, and air conditioning equipment and turn over to the Electrical Contractor for installation. All motor starters shall be provided with:

1 thermal overload per phase leg.

A 110 volt coil and a hand-off-automatic switch, if motors are subject to electrical interlock unless otherwise specified.

If equipment is provided with R.L.A. in excess of design conditions the Mechanical Contractor shall stand the expense of associated electrical changes.

It is the responsibility of the Mechanical Contractor to provide thermal overloads of the proper size as required by the actual motor nameplate amps. Motor starters shall comply with the requirements of the latest edition of the National Electrical Code and the local utility service company.

### PAINTING

All equipment furnished without factory paint or galvanized finish shall be thoroughly cleaned and given a prime coat, then a finish coat of paint in a color as selected by Architect/Engineer. Any equipment finish that is damaged or chipped, shall be spot painted to match existing surface. Any miscellaneous metals used by this Contractor that are not galvanized shall be given two coats of paint in color specified by Architect. Any rusty or corroded finishes shall be thoroughly cleaned and painted two coats of paint - one prime and one finish coat.

### TESTS AND GUARANTEES

After completion of his work, and when the building is ready for occupancy, this Contractor shall operate the air conditioning or heating system for a period of two days. During the tests, the Contractor shall adjust controls, outlets, etc.

The Contractor shall repeat operational sequence during heating and/or cooling season, whichever had not been subject to prior test period.

### SHOP DRAWINGS

Materials and equipment schedules shall be submitted as soon as practicable but not later than thirty (30) days after the date of award of contract, and before commencement of installation of any material or equipment. A complete schedule of the material and equipment proposed for installation shall be submitted for approval. The schedule shall include catalogs, cuts, diagrams, drawings, specifications and such other descriptive data as may be required by the Engineer. All materials required to be submitted for approval under this section shall be submitted at one time. Partial submittals will not be considered. They will be returned as "not approved".

Shop drawings shall be submitted for approval on the following items of equipment: Subject drawings shall include all data pertinent to the performance and installation of all equipment.

- Air distribution devices - grilles, diffusers, registers
- Temperature controls
- Insulation materials
- Packaged air conditioning units with hot gas reheat and gas fired heating furnace
- Wall mounted packaged heat pump units
- Electric heaters
- Exhaust fans
- Louvers
- Dampers
- Air purification device (bi-polar ionization)

### QUALITY OF MATERIALS AND EQUIPMENT

It is not the intent of these specifications to limit material and/or equipment selections to one manufacturer; however, the Engineer reserves the right to be the final and sole judge with regard to equals.

Approvals of equipment are based on capacities, equality of workmanship and components, or general and special construction features. Approval of equipment does not relieve the Contractor of coordination responsibility with other trades. Equipment shall fit within the physical space of equipment shown and have same general connection as that shown on drawings. Proper clearances shall be maintained for servicing and maintaining equipment.

Where equipment submitted varies from the general arrangement of that specified, Contractor shall submit detailed sheet-metal and equipment brochures. Shop drawings shall indicate any and all sheet-metal, electrical, piping and structural changes required to facilitate change. Any and all additional costs incurred by changes will be borne by this Contractor.

## PRODUCT DELIVERY, STORAGE & HANDLING

Deliver distribution devices in individual wrappings to prevent damage to finish surface of device.

Store in a dry, protected area until installed. After installation of devices, clean soiled surfaces.

## PART 2 - PRODUCTS

### REFRIGERANT PIPING

Piping shall be type "K" hard drawn copper, ASTM Spec. B280, and shall be mill cleaned, dried, and capped.

Fittings shall be extra heavy wrought copper in accordance with ANSI B9.1 with joints soldered using a high content silver alloy solder.

Installation shall be in accordance with unit manufacturer's requirements with all piping secured to walls and ceilings with approved galvanized hangers and clamps. Entire installation shall be in accordance with ANSI Standard B31.5 for refrigerant piping.

Insulate refrigerant suction line with 3/4" wall foamed plastic insulation slipped over tubing and all joints thoroughly sealed. Paint insulation with two coats of acrylic protective paint where insulation is exposed to weather. The first coat shall be white; the second coat shall be dark gray. Protect insulation with metal saddles and shields at all hanger points.

All refrigerant piping routed up along building exterior shall have a lineset cover system equal to Line-Hide. Cover system shall be of high-quality PVC construction with UV inhibitors for outdoor service. Cover shall be paint-able; coordinate color with Architect. Lineset cover shall have a -4 °F to 140 °F temperature range. Cover system shall have molded in mounting screw locations and include stainless steel assembly screws. All covers, couplings, elbows, joints, and caps shall be provided for refrigerant piping routing as shown. Cover system shall be suitable in size to completely cover the insulated refrigerant piping.

Suspend piping as required with approved pipe hangers at 4'-0" on center.

If field piping is used, piping diagrams shall be submitted by unit manufacturer showing pipe sizes, traps, service valves, etc., required for proper operation of equipment. Pre-charged tubing may be used at Contractor's option.

Test refrigerant system at 300 psi before charging system where units are to be field charged. System is to be thoroughly purged and evacuated before charging with refrigerant in accordance with manufacturer's recommendations. If factory pre-charged tubing is used, unit shall be checked and monitored for proper charge and efficient operation.

## ELECTRIC HEATERS

Electric heaters shall be factory installed and shall be furnished complete with air limiting and safety devices as required by National Electrical Code. Units shall bear UL approval for use in indoor unit. Sizes are to be as scheduled on drawings.

### WALL MOUNTED (RECESSED TYPE) ELECTRIC HEATER

Contractor shall provide and install heavy duty fan-forced heater recessed into wall where shown on plans and of capacities as indicated. Heater shall have spiral finned metal sheathed elements. Spiral fins shall be brazed to sheath to insure proper heat transfer. Safety protection shall be provided by an automatic reset wired in heater circuit to deenergize element and motor circuit in case of an over temperature condition. Heater fan and motor shall be sized to deliver at least 210 CFM to insure proper heat circulation. Motor shall be totally enclosed and permanently lubricated. Motor circuit shall have fan delay to insure heated air delivery when heater comes on and to dissipate heat when heater turns off. Heater shall have built-in thermostat and disconnect switch with either tamper proof control knobs or exposed control knobs as listed on schedule. Heater shall have fan only mode switch for summer air circulation. Heater grill and frame shall be constructed of heavy gauge die-formed steel bonderized and painted with a heavy coat of industrial grade baked enamel. Wall heater shall be UL listed and shall be installed in accordance with manufacturer's instructions and with all National and Local Electrical Codes. Heavy duty wall heater shall be by Markel - Series 3300.

### PACKAGED AIR CONDITIONING UNITS WITH GAS FIRED HEATING FURNACE

#### General

Equipment installation shall include but not limited to:

- Package frame supported unit.
- Heat exchanger.
- Refrigeration components.
- Unit operating controls.
- Electrical power connections.
- Operation and maintenance service.

#### References

- ANSI/NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
- AHRI 360 - Unitary Air-Conditioning Equipment.
- ANSI/ASHRAE/IESNA 90.1-1999 - Energy Standard for New Buildings Except Low-Rise Residential Buildings.

#### Handling

Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

Protect units from physical damage. Leave factory shipping covers in place until installation.

### Warranty

Provide a full parts, labor, and refrigerant warranty for 60 months from start-up or 66 months from shipment, whichever occurs first.

### Summary

The contractor shall furnish and install package pad mounted air conditioning unit(s) as shown and scheduled on the contract documents. The unit(s) shall be installed in accordance with this specification and perform at the specified conditions as scheduled.

### General Unit Description

Unit(s) furnished and installed shall be packaged pad mounted as scheduled on contract documents and these specifications. Cooling performance shall be based on AHRI testing procedures. Wiring internal to the unit shall be numbered for simplified identification. Units shall be cULus listed and labeled, classified in accordance with cULus for Central Cooling Air Conditioners. Unit(s) shall be factory assembled, internally wired, fully charged and consist of insulated weathertight casing with compressors, air cooled condenser coil, condenser fans, evaporator coil, filters, supply and/or exhaust motors and drives, unit controls and heat as scheduled.

Unit(s) shall have labels, decals, and/or tags to aid in the service of the unit and indicate caution areas.

### Unit Casing

Cabinet: Galvanized steel, phosphatized, and finished with a pre-applied baked polyurethane enamel. Cabinet surface shall be tested 672 hours in salt spray in compliance with ASTM B117. Fully gasketed removable access panels with hinges. Structural members shall be heavy gauge with access doors and removable panels of heavy gauge. Provide 1/2 inch thick foil faced fiberglass insulation on all exterior panels and roof in contact with the return and conditioned air stream. Cabinet top cover shall be one piece construction or where seams exist, it shall be double hemmed and gasket sealed.

### Electrical Power Connections

Factory-made penetrations shall be provided for connection of all electrical wiring. These wiring provisions shall be through the side of the cabinet. Field penetrations of the unit base pan shall not be acceptable.

Unit shall include a phase monitor as standard that protects equipment from phase loss, phase reversal, and low voltage. Any fault condition shall produce a Failure Indicator LED, and send the unit into an emergency stop condition. The entire unit with this option shall be cULus approved. If not, a field UL inspection is required.

Provide factory installed disconnect and powered GFCI outlet. The unit must have factory furnished and installed transformer for the GFCI outlet. If a field wired outlet is supplied, then the installing contractor will be responsible for the additional cost of the electrical runs.

### Air Filters

Air Filters: Filters shall mount integrally within unit and be accessible through hinged access panels. Filters shall be minimum of 4" thick and MERV8.

### Fans - Supply

Provide forward-curved fan mounted with fixed pitch sheave drive assembly. Complete fans assemblies shall be statically and dynamically balanced.

Fan shaft shall be mounted on grease lubricated ball bearings. All motors shall be circuit breaker protected. Fans shall be controlled as Single Zone Variable Air Volume with a full VFD with bypass. No two speed or four speed fan options will be accepted as alternatives.

### Gas Fired Heating Section

Completely assembled and factory-installed heating system shall be integral to unit, cULus approved specifically for outdoor applications for use downstream from refrigerant cooling coils. Threaded connection with plug or cap provided. Provide capability for gas piping connection through side of unit. The Module must be capable of 2.5:1 turndown rate at a minimum.

Gas Burner Safety Controls: Provide safety controls for the proving of combustion air prior to ignition, and continuous flame supervision. Upon a failure to ignite, three attempts of ignition will occur before lockout of the ignition system.

Combustion blower shall be centrifugal type fan with built-in thermal overload protection on fan motor.

Heat Exchanger: Provide drum and tube heat exchanger of free floating design manufactured from 14-gauge 304 stainless steel drum and 16-gauge 304 stainless steel tubes. Factory pressure and leak tested.

Limit controls: High temperature limit controls will shut off gas flow in the event of excessive temperatures resulting from restricted indoor airflow or loss of indoor airflow.

### Evaporator Coil

Provide heavy duty aluminum fins mechanically bonded to internally enhanced, copper tubes.

Provide a thermostatic expansion valve for each refrigeration circuit. All coils shall be leak tested at the factory to ensure pressure integrity. The evaporator coil is pressure tested to 450 psig.

Unit shall include a Condensate Overflow Switch to shut the unit down in the event that a clogged condensate drain line prevents proper condensate removal from the unit.

Unit shall include Sloped Stainless Steel evaporator coil drain pans that are durable, long-lasting and highly corrosion resistant.

### Condenser Section

Provide all Aluminum Microchannel epoxy coated condenser coils. All condenser coils shall be leak tested at the factory to ensure pressure integrity and pressure tested to 650 psig.

Condenser Coating must be Factory applied to withstand ASTM B117 Salt Spray test for 6000 hours and ASTM G85 A2 Cyclic Acidified Salt Fog test for 2400 hours. To provide optimal protection in more corrosive environments, coating shall cover all tubes, headers



and fin edges.

Provide integral subcooling circuit(s) to prevent premature refrigerant flashing and to insure maximum operating efficiency.

Provide horizontal discharge, direct drive fans with steel blades, and three phase motors. Fans shall be statically balanced. Motors shall be permanently lubricated, with built-in current and thermal overload protection in a weathertight casing.

Provide tool-less factory installed corrosion resistant louvered hail/vandalism guards to protect condenser coils from hail or physical damage. Wire mesh coil guards shall not be acceptable.

#### Refrigeration System

R410A refrigerant

Provide with thermostatic temperature motor winding control for protection against excessive temperatures caused by over-/under voltage operation or loss of charge. Also provide high and low pressure cutouts.

Provide a minimum of 5 stages of cooling or variable speed compressor control.

Refrigeration system shall include a reheat condenser factory installed downstream of the unit evaporator coil. Modulating valves shall control the flow of refrigerant between the indoor reheat and outdoor condensers in response to the unit discharge air temperature in order to dehumidify the space during low load conditions.

#### Outdoor Air Section

Provide a fully integrated factory installed 100% modulating outside air economizer with unit return and barometric relief air dampers. Economizer operation shall be through microprocessor based primary temperature controls that automatically modulate dampers to maintain space temperature conditions.

Provide economizer with differential enthalpy controls factory installed.

Provide spring return motor for outside air damper closure during unit shutdown or power interruption.

Provide integrated CO2 based demand control ventilation utilizing space/duct CO2 sensors (as shown on plans) with sensor and control boards provided by RTU manufacturer.

The unit shall include a room humidity sensor to monitor and control to maintain a space humidity of 50% RH at the scheduled setpoint.

#### Unit Controls

General: Microprocessor controls shall be provided for all 24 volt control functions. The resident control algorithms shall make all heating, cooling and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point and provides better building comfort. A centralized microprocessor shall provide anti-short

cycle timing and time delay between compressors to provide a higher level of machine protection.

Variable Air Volume Controls: Provide all necessary controls to operate a Single zone VAV rooftop from supply air temperature including supply air microprocessor controller, and supply air sensor. The microprocessor shall coordinate the economizer control and stages of cooling with supply air temperature reset capability based upon return temperature.

The following setpoints shall be accessible in the unit control panel: supply air cooling setpoint, morning warmup setpoint, reset setpoint, reset amount.

Compensated Outside Air Control - shall be provided to control outside air damper positioning, maintaining minimum outside air requirements, during operation of variable air volume (VAV) systems.

Clogged filter indication: Provide factory installed differential pressure switch to indicate filter replacement status. Differential pressure switch shall cause a contact closure to display a service indication and unit will continue to operate normally.

#### Building Management System

Control Functions: Include unit scheduling, occupied/unoccupied mode, start-up and coast-down modes, nighttime free-cool purge mode, demand limiting, night setback, discharge air set point adjustment, timed override and alarm shutdown.

Remote Monitoring: BAS system shall include modem to provide remote dial in and dial out capabilities.

Diagnostic Functions shall include: Unit operating mode, Unit failure status, cooling failure, emergency service stop indication, supply fan proving, timed override activation, high temperature thermostat status, Zone temperature, Supply air temperature, Cooling status (all stages), Stage activated or not, Stage locked out by UCP, HPC status for that stage, Compressor disable inputs, Number of stages activated, High temperature limit status, Economizer status, Enthalpy favorability status, Requested minimum position, Damper position, Dry bulb/enthalpy input status, Outside air temperature, Outside relative humidity,

Sensor Failure: Humidity sensor, OAT sensor, SAT sensor, RAT sensor, Zone temperature sensor, Mode input, Cooling setpoints from sensors (CV only), Static pressure transducer, Unit mounted potentiometer, SAT from potentiometer (VAV only), Air reset setpoint from potentiometer (VAV only), Unit Configuration data, Gas or electric heat, Economizer present, High temp input status, Local setpoint, Local mode, Inlet Guide Vane position/VFD %.

Unit operating mode

Unit failure status

Cooling failure

Emergency service stop indication

Supply fan proving

Timed override activation

High temperature thermostat status

Zone temperature  
Supply air temperature  
Cooling status (all stages)  
Stage activated or not  
Stage locked out by UCP  
HPC status for that stage  
Compressor disable inputs  
Number of stages activated  
High temperature limit status  
Economizer status  
Enthalpy favorability status  
Damper position  
Outside air temperature  
OAT sensor (Fail/Normal)  
SAT sensor (Fail/Normal)  
RAT sensor (Fail/Normal)  
Zone temperature sensor (Fail/Normal)  
Mode input (Fail/Normal)  
Cooling/heating setpoints from sensors (CV only) (Fail/Normal)  
Static pressure transducer (Fail/Normal)  
Unit mounted potentiometer (Fail/Normal)  
SAT from potentiometer (VAV only) (Fail/Normal)  
Air reset setpoint from potentiometer (VAV only) (Fail/Normal)  
Unit Configuration data  
Gas or electric heat  
Economizer present  
High temp input status  
Local setpoint  
Local mode

Provide capabilities for Boolean Processing and trend logs as well as "templated" reports and logs.

#### Installation

Install in accordance with manufacturer's instructions.

Mount units on factory built roof mounting frame providing watertight enclosure to protect ductwork. Install roof mounting curb level.

#### Manufacturer's Field Services

Manufacturer shall furnish a factory trained service engineer without additional charge to start the unit(s). Package rooftop unitary manufacturers shall maintain service capabilities no more than 50 miles from the jobsite.

The manufacturer shall furnish complete submittal wiring diagrams of the package unit as applicable for field maintenance and service.

#### WALL MOUNTED PACKAGED HEAT PUMP UNITS

Units shall be certified under the ARI certification program and listed by Underwriter's Laboratories. Units shall be as manufactured by G.E. Zonline.

Controls shall be completely wired and accessible from the top of the unit. Push button controls shall include high and low fan speed for cooling, heating, fan only operation, and off. A cross-ambient thermostat control will cycle unit to maintain space conditions. A concealed ventilation control shall allow the introduction of outside air into the room. A concealed fan mode switch shall allow the Owner to preset continuous fan or thermostatically cycled fan operation. A concealed emergency heat switch shall allow the Owner to override heat pump units changeover thermostat to bring on electric resistance heat. Heat pump unit shall include a changeover thermostat, lock-open refrigerant reversing valve with in heat pump operation and temperature - activated defrost drain.

Compressor shall be hermetically sealed, internally isolated, rotary-type and permanently mounted on rubber isolators.

Evaporator and condenser fans shall be direct drive with permanent split capacitor two speed motors. Evaporator fan shall be cross flow (tangential) type. Condenser fan shall be propeller type.

Wall sleeve shall be single piece galvanized steel with electrode position paint finish and high-solids polyester over spray. Sleeve shall be shipped with weather resistant rear closure panel installed.

Unit chassis shall be slide out design shipped with front installed. Unit chassis must have the ability to be installed with a zero clearance from the floor.

Evaporator and condenser coils shall have rifled copper tubing with rippled-edge louvered aluminum fins.

Subbases shall be pre-wired to minimize on-site electrical connection and include NEMA 6 or 7 configuration electrical receptacle. It shall have two leveling screws for sleeve support and accurate unit leveling. Physical disconnect switch mounting, cartridge-style fuse holder locations, and side skirts shall be provided.

Air discharge shall have sloped discharge so that obstructions cannot be placed on unit. Discharge is directed into the room at an angle of 15 or 40 degrees from the vertical position. Discharge and return grilles shall be of polycarbonate material to resist bending, cracking, and corrosion.

Outside grille shall be an architectural type grille.

Warranty shall be a full one year on entire unit. Second year limited warranty on all electrical components, parts, and labor. Second through fifth year full warranty on all sealed system components.

### EXHAUST FANS & GRAVITY VENTILATORS

All exhaust fans shall bear the AMCA Seal of Approval and shall be currently listed in the current AMCA Directory.

Motors shall have a 1 year manufacturer's warranty.

### BATHROOM EXHAUST FANS

Exhaust fans shall be ceiling mounted type fans with 1/2" thick acoustical lined steel housing, direct drive centrifugal fan, back draft damper and integral aluminum ceiling grille. Fans shall have integral disconnect switch and speed controller. Fan control shall be as indicated on schedules. Fans shall be equal to Greenheck SP Series, Loren Cook GC Series, Twin City, or approved equal.

#### IN-LINE EXHAUST FAN

Duct mounted exhaust fans shall be of the centrifugal belt driven, in-line type. The fan housing shall be of the square design constructed of heavy gauge galvanized steel and shall include square duct mounting collars.

Fan construction shall include two removable access panels located perpendicular to the motor mounting panel. The access panels must be of sufficient size to permit easy access to all interior components.

The fan wheel shall be centrifugal backward inclined, constructed of aluminum and shall include a wheel cone carefully matched to the inlet cone for precise running tolerances. Wheels shall be statically and dynamically balanced.

Motors shall be heavy duty ball bearing type, carefully matched to the fan load and furnished at the specified voltage, phase, and enclosure. Motors and drives shall be mounted out of the airstream. Motors shall be readily accessible for maintenance.

Precision ground and polished fan shafts shall be mounted in permanently sealed, lubricated pillow block ball bearings. Bearings shall be selected for a minimum (L50) life in excess of 200,000 hours at maximum cataloged operating speed.

Drives shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be of the fully machined cast iron type, keyed and securely attached to the wheel and motor shafts.

Motor pulleys shall be adjustable for final system balancing. A NEMA 1 disconnect switch shall be provided as standard. Factory wiring shall be provided from motor to the handy box.

Each fan shall bear a permanently affixed manufacturer's nameplate containing the model number and individual serial number for future identification.

#### ROOF MOUNTED INTAKE HOOD

Hood shall be gravity type and constructed of spun aluminum. Install with roof curb. Unit shall be equal to Greenheck GRS Series.

#### CONTROL OPERATIONS

General space temperature shall be controlled by wall mounted direct digital control (DDC) temperature sensors (as provided by Siemens) located within the spaces as indicated on drawings. Refer to specification Section 15900 & 15950 for additional information. Equipment operation shall be as per Sequence of Operations indicated on drawings.

Provide a clear, lockable plastic enclosure for each wall mounted controller.

Wiring: All control wiring external to the equipment shall be installed by the Controls sub-contractor under the direct supervision of the HVAC subcontractor. Control wiring shall be installed in conduit (see below) and shall be color coded to match system wiring diagrams and shall be installed in accordance with the electrical section of the project specifications.

Note: All power wiring required for equipment operations shall be by the Electrical contractor. This contractor shall also provide all conduits as required for control wiring.

Test all units for two (2) 8-hour days under the supervision of manufacturer's representative, who shall make all necessary adjustments and instruct designated operating personnel in operation and maintenance of equipment and controls.

## CONTROLS

Controls sub-contractor shall furnish and install all relays, transformers, contacts, etc., as required to control automatically the heating and air conditioning equipment. Submit control drawings for approval. Control drawings shall be complete and shall indicate complete control sequence of operation.

All control wiring shall be installed in conduit and shall be sized as recommended by unit manufacturer. All wiring shall be color coded to match system wiring diagrams and shall be installed in accordance with the electrical section of this specification.

The units shall be started and stopped by wall mounted DDC temperature sensors as provided by Siemens. Space temperature shall be controlled by wall mounted temperature sensors. Provide clear locking plastic guard. Provide all interlocks as indicated on drawings. Temperature sensors shall have manual override capability.

## DUCTWORK

The sizes, runs, and connections of ducts shall be as indicated. Adhere to drawings as closely as possible. The right is reserved, however, if required to meet structural or other interferences, to vary run and shape of ducts and offsets during progress of work, at no extra cost to the Owner. Ductwork specified herein shall have rectangular cross section, unless otherwise indicated.

Materials - Methods of Construction: Details of construction and materials not specified herein shall be in accordance with SMACNA Low Velocity and ASHRAE "Guide" recommendations. Fabricate ductwork in workmanlike manner with airtight joints presenting smooth surface on inside, neatly finished on outside. Seal all duct joints airtight with approved tape or mastic before insulation is applied. Construct ductwork air extractors, spin-in taps with air scoops, turning vanes, splitter dampers, etc., to ease air flow and balancing of air. The joint between the trunk duct and any air extractor or spin-in tap shall be sealed with approved tape or mastic. Unless otherwise indicated, where square elbows have to be used, provide fixed deflectors. Construct, brace and support ducts in manner that they will not sag or vibrate to any perceptible extent when fans are operating at maximum speed and capacity. Ductwork shall be galvanized sheet steel unless otherwise specified. Distance between joints of any size duct shall not exceed 8'.

Flexible ductwork shall be the acoustical insulated type with mechanical lock helix. Flex duct shall have factory wrapped, fiberglass insulation and fire retardant, reinforced metalized aluminum vapor barrier. Helix shall be corrosion resistant galvanized steel, formed and mechanically locked to fabric. Flexible duct shall have a CPE inner film liner. Ductwork shall be in accordance with UL 181. Flexible duct shall have a working pressure of up to 6" w.g. positive pressure (thru 16" diameter). Operating temperature shall be from -20 °F to 200 °F. Flame spread shall be less than 25 and smoke developed rating shall be less than 50. Ductwork shall have a minimum insulating value of R=6.0. Maximum length shall be limited to 8'-0". Extend round snap-lock duct as required. Flexible duct shall be Flexmaster Type 9M or equal.

Sheet metal gauges for rectangular duct construction shall be:

Steel U.S. Std. Gauge	Maximum Size Inches	Type of Transverse Joint Conn.	Bracing
26	Up to 12	S-Drive, pocket or bar clips, on 7'-10" centers with tape or mastic	None
24	13 to 24	S-Drive, pocket or bar clips, on 7'-10" centers with tape or mastic	None
24	25 to 30	S-Drive, pocket or bar clips, on 7'-10" centers with tape or mastic	1x1x1/8" angle 4' from joint

Duct Support: Support horizontal ducts with hangers spaced not more than 8' apart, place hangers at changes in directions. Use strap hangers for ducts up to 30" wide, angle hangers for ducts over 30" wide. Make strap hangers 1" by 16-gauge minimum, extended down both sides of duct and turn under bottom 2" minimum, fasten sides and bottom with sheet metal screws.

Provide flexible duct connections between ducts and air handler. Connectors shall be constructed of 29 ounce, fire resistant, neoprene-coated fiberglass approximately 6" wide, bordered by crimping to sheet metal and fastened to ducts with screws not more than 2" on centers. Connection shall meet pressure classification of duct system used. Acceptable manufacturers shall be Ductmate, DuroDyne, or FanAir.

Spin-in fittings for connection run-outs to trunk duct shall be Air-Trac, Flexmaster, Ductmate, or approved equal. Fitting shall have a balancing butterfly damper and air extractor. Provide minimum 22-gage spin-in and scoop with a 20-gage damper. Perimeter clearance of damper in spin-in shall not exceed 1/8".

### EXPOSED DUCTWORK

All exposed ductwork shall be constructed of double-wall spiral duct. The exterior surface of the duct shall be a clean, paintable surface. The interior surface shall be a perforated liner with minimum R-value of 6.

Round Ducts: Round ducts and fittings shall be spiral pipe and fittings. The duct shall be double wall with a perforated inner wall. Use couplings at connection of flexible tubing. Assembly and installation shall be in accordance with SMACNA HVAC Duct Assembly Standards, 4" static pressure rating, Class A seal, Chapter No. 3, and manufacturer's installation data shipped with material. Reinforcement of flat oval ducts shall be for 6 inches W.G.

Fittings: All 90° tees shall be conical; unless otherwise noted, all elbows and offsets shall be 1.5 radius die formed type for 8" and smaller sizes, 5 gore for larger sizes. All fittings shall be factory fabricated by spiral duct manufacturer. Provide relief type access panels (RAP) downstream of all fire dampers and smoke dampers and where indicated on drawings.

Test: Duct shall be pressure tested in accordance with SMACNA HVAC Air Duct Leakage Test Manual, as a whole or in part prior to installation of flexible duct and connection to equipment. Ducts shall be tested at 4" W.C. and shall provide Class A leakage.

Joints: Seal all joints with high-pressure duct sealant. On exposed duct, apply sealant to female fittings; sealant shall not be visible.

Layout Basis: United McGill Corporation. Fittings shall have performance and arrangement of United McGill Corporation products.

Manufacturers: Semco, Inc., U.S. Air Duct, United Sheet Metal Company, West-Sprio Co., Monroe Metals, Air Distributing Systems, Dixies Sheet Metal Products, Norlock.

## EXPOSED FABRIC DUCTWORK

### Description of Work

Extent on non-metal ductwork is indicated on drawings and by requirements of this section.

Types of non-metal ductwork required for this project include the following: Fabric Air Dispersion Projects.

### Quality Assurance

Building Codes and Standards.

Product must be classified by Underwriter's Laboratories in accordance with the 25/50 flame spread / smoke developed requirements of NFPA 90-A.

All product sections must be labeled with the logo and classification marking of Underwriter's Laboratories.

Product must have an acceptable evaluation report (ER-5801) from ICBO-ES.

### Design & Quality Control

Manufacturer must have documented design support information including duct sizing, vent and orifice location, vent and orifice sizing, length, and suspension. Parameters for design, including maximum air temperature, velocity, pressure and fabric permeability, shall be considered and documented.



### Submittals

Product Data: Submit manufacturer's specifications on materials and manufactured products used for work of this section.

### Building Code Data

Submit UL file number under which project is Classified by Underwriter's Laboratories.

### Warranty

Manufacturer must provide a 10 year warranty program for products supplied for the fabric portion of this system.

### Delivery, Storage and Handling

Protect fabric air dispersion systems from damage during shipping, storage and handling.

Where possible, store products inside and protect from weather. Where necessary to store outside, store above grade and enclose with a vented waterproof wrapping.

Manufacturer: Subject to compliance with requirements, provide products manufactured in the United States by DuctSox or an approved equal

### Fabric Air Dispersion System

Sedona Fabric: Air diffusers shall be constructed of a woven fire retardant fabric complying with the following physical characteristics:

Fabric Construction: 100% Flame Retardant

Weight: 6.75 oz./yd<sup>2</sup> per ASTM D3776

Color: to be selected by Architect

Air Permeability: 2 (+2/-1)cfm/ft<sup>2</sup> per ASTM D737, Frazier

Temperature Range: 0 degrees F to 180 degrees F

### Fire Retardancy

Classified by Underwriters Laboratories in accordance with the flame spread/smoke developed requirements of NFPA 90-A.

### Systems Fabrication Requirements

Air dispersion accomplished by linear vent and permeable fabric, linear vent to consist of many 3/16" diameter open orifices rather than a mesh style vent to reduce maintenance requirements (common to mesh style).

Size of and location of linear vents to be specified and approved by manufacturer.

Inlet connection to metal duct via fabric draw band with anchor patches as supplied by manufacturer. Anchor patches to be secured to metal duct via. zip screw fastener – supplied by contractor.

Inlet connection includes zipper for easy removal / maintenance.

Lengths to include required zippers as specified by manufacturer.

System to include Adjustable Flow Devices to balance turbulence, airflow and distribution as needed. Flow restriction device shall include ability to adjust the airflow resistance from 0.06 – 0.60 in w.g. static pressure.

End cap includes zipper for easy maintenance.

Fabric system shall include connectors to accommodate suspension system listed below. Any deviation from a straight run shall be made using a gored elbow or an efficiency tee. Normal 90 degree elbows are 5 gores and the radius of the elbow is 1.5 times the diameter of the DuctSox.

#### Design Parameters

Fabric air diffusers shall be designed from 0.25" water gage minimum to 3.0" maximum, with 0.5" as the standard.

Fabric air diffusers shall be limited to design temperatures between 0 degrees F and 180 degrees F (-17.8 degrees C and 82 degrees C).

Design CFM, static pressure and diffuser length shall be designed or approved by the manufacturer.

Do not use fabric diffusers in concealed locations.

Use fabric diffusers only for positive pressure air distribution components of the mechanical ventilation system.

#### Suspension Hardware

The duct suspension shall be with a 3 x 1 suspension system. The duct shall clip to the suspension cable at 12:00. the duct shall clip to the aluminum hanger at 2:00 and 10:00. Reference the suspension detail on the drawings.

#### DAMPERS

Provide splitter and deflecting vanes for control of air volume and direction, and for balancing system where indicated, specified, directed or required.

Dampers shall be of same materials as duct, at least one gauge heavier than duct, reinforced where directed, and shall have an accessible location indicating quadrant, locking device for adjusting and locking dampers in position.

Stiffen duct at damper location, install damper in manner to prevent rattling.

Vertical fire dampers shall be curtain type with fusible link. Curtain shall be mounted out of airstream. Dampers shall be furnished and installed at locations shown on plans. Fire dampers shall be constructed and tested in accordance with UL Safety Standard 555. Each fire damper shall have a 1-1/2 hour fire protection rating, 165°F fusible link, and shall include a UL label in accordance with established UL labeling procedures. Fire dampers

shall be equipped for installation as required by the location shown. Fire dampers shall be installed in openings utilizing steel sleeves, angles, other materials, and practices required to provide an installation equivalent to that utilized by the manufacturer when dampers were tested at UL. Installation shall be in accordance with the fire damper manufacturer's instructions. Fire dampers shall be Ruskin type IBD2 or approved equal. Verify required rating in field prior to installation.

Manual volume dampers shall be of the opposed blade type. They shall be furnished in sizes shown on plans. Frame and blades shall be 16-gauge galvanized steel with mill galvanized finish. Frames shall be structurally equivalent to 13-gage U-channel. Blades shall have horizontal orientation. Provide with 2" hand quadrant standoff bracket for insulated ductwork. Manual volume dampers shall be suitable for application in HVAC systems with velocities up to 1500 fpm. Dampers shall be tested in accordance with AMCA 500. Equal to Ruskin Model MD35.

Automatic (motorized) dampers shall be of the parallel blade type. They shall be furnished in sizes shown on plans. Frame and blades shall be 14-gage galvanized steel with mill galvanized finish. Blades shall have horizontal orientation and be airfoil type for low pressure drop and low noise generation. Linkage and hardware shall be zinc plated steel. Dampers shall be provided with solid stops for tight closing with sales on the blade edges and the sides of the damper frame which will stand a temperature of up to 200°F. These stops shall be so assembled that they may be easily replaced if they become damaged. Damper gasket shall be continuous 3/16" x 1/2" closed cell neoprene type. Bearings shall be corrosion resistant oil tight stainless steel sleeve type. Dampers shall be tight closing and shall be capable of less than 3.5% leakage based on an approach velocity of 1500 feet per minute when closed against a pressure of 4" w.g. Submit leakage and flow characteristic data. Motorized dampers shall be suitable for application in HVAC systems with velocities up to 2000 fpm. Motorized dampers shall be equal to Ruskin No. CD60.

Fire dampers shall be provided with an approved means of access, large enough to permit inspection and maintenance of the damper and its components. The access shall not affect the integrity of the fire-resistance rated assemblies. The access opening shall not reduce the fire-resistance rating of the assembly. Access points shall be permanently identified on the exterior by a label having letters not less than 0.5" in height reading: FIRE DAMPER. Access doors in ducts shall be tight fitting and suitable for the required duct construction.

Manufacturers: Dampers may also be manufactured by Air Balance, Arrow United Industries, Greenheck, Industrial Louvers, Louvers and Dampers, or Nailor-Hart.

#### GRILLES, REGISTERS, AND DIFFUSERS

Location of ceiling mounted and sidewall air devices shall be as shown on plans. Install and fasten air distribution devices per manufacturer's detailed drawings. Use gaskets to make air-tight joints with adjoining construction. Supply, return, exhaust, and transfer air grilles and diffusers shall be sized not to exceed a N.C. level of (25).

All air devices installed in rated ceiling assembly shall be of steel construction. Reference Architectural Life Safety plans.

Ceiling diffuser shall be equal to Titus series TDC-AA- adjustable type with 24" x 24" lay-in panel supply diffuser with opposed blade balancing damper of size and capacity as indicated on drawings. Provide with directional throws as indicated on the plans. Provide with square to round duct connection. Round duct connection and face size shall be as shown on plans. Delete panel for ceiling diffusers installed in rigid ceilings. Finish shall be off-white color.

Ceiling mounted return and transfer air grilles shall be equal to Titus Series 50F. Grilles shall be of aluminum construction with a 1/2"x1/2"x1/2" aluminum grid. Grille shall have a 90% free area (minimum). Provide with opposed blade damper (except for transfer/pressure relief). Border shall have countersunk screw holes for a neat appearance. Sizes shall be as indicated on plans. Finish shall be off-white color.

Sidewall supply grilles shall be equal to Titus 300FS. Blades shall be double deflection type with the blades parallel to the short dimension. Blades shall be spaced at 3/4" on center. Grilles shall be of aluminum construction. Border shall have countersunk screw holes for a neat appearance.

Sidewall return and transfer grilles shall be equal to Titus 350ZFL. Blades shall be fixed deflection type with blades parallel to the long dimension. Blades shall be at a 0° deflection angle. Grilles shall be of aluminum construction. Border shall have countersunk screw holes for a neat appearance.

Location of ceiling mounted air distribution devices shall be as shown on the reflected ceiling plan. Install and fasten ceiling diffuser and return air grilles as per manufacturer's detailed drawings, use gaskets to make airtight joints with adjoining construction, join neatly with adjoining finished surface.

Acceptable manufacturers are Carnes, Nailor, Greenheck, Metal-aire, Titus, Price, or equal.

## INSULATION

General: All insulation work shall be done by workmen thoroughly competent in this trade and employed by a full-time insulation contractor. Failure to finish work neatly, failure to vapor proof joints, ragged edges, failure to cover all fittings, valves, dents on surface, etc., shall be proper cause to reject this work. This Contractor shall call same to the attention of the Architect before such work has progressed beyond the point of economical correction.

All material used shall be new and of first line quality and shall be as recommended by the manufacturer for the service intended. All insulation materials, including sealer material, adhesive, finishes, etc., shall be non-combustible. Complete installation shall be in accordance with manufacturer's requirements.

This Contractor shall be responsible for the removal from the site of all excess materials, cartons, scrap, etc. He shall protect equipment installed by others, cleaning such equipment should mortar, plaster, adhesive, etc., fall on same.

The following service shall be insulated with the listed thickness of materials:

<u>SERVICE</u>	<u>INSULATION MATERIAL</u>	<u>THICKNESS</u>	<u>FINISH</u>
Condensate Drain Piping & Refrigerant Piping	Armaflex Type ER	3/8"	Paint with acrylic protective paint where exposed to sun
Rectangular Supply, Return, Exhaust, and Outside Air Ductwork	1 lb. density blanket type fiberglass duct wrap (minimum R=6.0)	2"	Reinforced aluminum foil

All Armaflex insulation shall be slipped over piping with all joints sealed with an approved mastic.

All insulation shall be installed as per material manufacturer's printed instructions.

Where piping insulation for condensate drain lines and/or refrigerant piping is exposed to the sun, the Contractor shall paint the insulation with two (2) coats of acrylic protective paint for UV protection. The first coat shall be white and the second coat shall be gray.

Insulation subcontractor shall submit complete product data brochures on insulation materials, jackets, finishes, mastics, cements, etc., for approval along with complete installation brochures for all materials used on this project. Installation methods shall be in accordance with printed instructions from material manufacturers.

It shall be the responsibility of the insulating subcontractor to coordinate hanger locations and prevent crushing or breaking of finishes.

All insulation materials, jackets, adhesives, coatings, etc., shall meet the Underwriters' Laboratories fire hazard classification (UL 723), for flame spread rating of 25, smoke developed rating of 50, and fuel contributed rating of 50.

Exterior duct insulation shall be applied outside of all heating and air conditioning ductwork in accordance with SMACNA Standards. Insulation shall be constructed of glass fiber and shall be 1.0 pound density, 2" thick and comply with NFPA Bulletins 90A and 90B (minimum R value = 6). Insulation shall be wrapped and shall be secured with duct bands. All joints in insulation shall be butted together and brushed with adhesive. Insulation shall be by Owens Corning, Knauf, Pittsburg Corning, or equal.

Exterior ductwork shall be equal to Therma duct.

#### AUTOMATIC SHUT-DOWN

Air conditioning equipment (over 2,000 cfm and/or as indicated on the plans) shall have smoke detectors installed in supply air and return air positions. Mechanical contractor shall install smoke detectors provided by electrical contractor under Division 16000. Mechanical contractor shall install smoke detectors in return air duct prior to mixing with any outdoor air. Smoke detectors shall be for automatic shut down of unit. Duct detector installation shall be in strict accordance with the manufacturer's instructions. Smoke detectors shall be connected to the building Fire Alarm System by the Electrical Contractor.

All duct mounted smoke detectors, low voltage wiring, relays, contactors, etc., necessary for interlocking air handling units for complete unit shut down upon smoke detection shall be furnished by the electrical contractor. Rigid conduit for low voltage wiring shall be

furnished and installed by the electrical contractor. Smoke detectors shall be photoelectric 24 volt duct mountable or plenum mountable type as indicated on the drawings and shall be equal to System Sensor (Photoelectric).

At contractor's option, a line voltage smoke detector may be installed, however, installation must be accomplished by a certified fire alarm systems installer and the contractor shall be responsible for obtaining all components and services necessary for the installation of a complete tested and operational system.

### AIR CONDITIONING FILTRATION

Air Conditioning Systems Filtration Notes: It is the mechanical contractors responsibility to ensure the inside of each air handling unit with associated air distribution system is kept cleaned and not allow construction dust to infiltrate the system. Should the system become contaminated as determined by Architect, Engineer or Owner, the mechanical contractor shall be responsible for cleaning. The mechanical contractor shall take any precautions necessary to prevent construction dust from entering the system which shall include as a minimum:

Prior to activating the air conditioning system for building finish work, all filters shall be installed in each air handling unit.

The mechanical contractor shall maintain clean filters at all times. Regular filter replacement is recommended.

Prior to the Owner taking possession of the building, all filters in each air handling unit shall be replaced new. One complete set of replacement filters for each air handling unit shall be turned over to Owner for future installation.

At no time are any air handling units to be operated without air filters. Return grilles are to be covered with filter media during construction when units are in operation.

### ACCESS DOORS

Air duct access doors shall be steel of the double wall insulated type complete with hinges and camlock latches. Insulation shall be 1" thick fiberglass with "K" factor of 0.26 at 75°F mean temperature. Provide access doors at all fire dampers and where indicated. Doors smaller than 8" shall have plexiglass window. Coordinate with specification section 08345 (this contractor to furnish).

Duct Diameter Access Opening	
8" thru 10"	7" dia.
11" thru 13"	10" dia.
14" thru 19"	13" dia.
20" and over	18" dia.

For flat oval and rectangular ducts, the nominal size of the access opening shall be:

When mounted on minor axis:

Minor Axis	Access Opening
8" thru 11"	8"x12"

12" thru 13"	12"x12"
14" and over	14"x20"

When mounted on major axis:

Major Axis	Access Opening
8" thru 16"	8"x12"
17" thru 24"	12"x12"
25" and over	14"x20"

When used with insulated ducts, the access sections shall have glazed covers to prevent condensation.

Duct Access Doors (Low Pressure) – Duct access doors shall be suitable for installation in duct indicated on plan. Access doors shall be rated for systems with up to 2" external w.c. Install per manufacturer's recommendations. Access doors shall be sized and located to provide convenient access for inspection and resetting of fire dampers. Access doors shall be Ruskin ADH22 in all respects or equal by Greenheck, NCA, or Nailor.

### DRAIN CONNECTIONS

Provide drain connection with P- trap with appropriate depth for system pressure for all cooling coils at air handling units. Drain piping shall be Type 'L' copper or Schedule 40 PVC pipe with drainage pattern fittings and cement mastic joints insulated with 3/8" wall closed cell elastomeric insulation slipped over piping. Drain piping passing through a fire rated barrier or return air plenum shall be metal and fire rated (i.e. steel, copper, etc.). Slope piping at 1/4" per foot to nearest floor drain, hub drain, or as indicated on plans. Refer to plumbing plans for location of floor and/or hub drains.

### FILTERS

Filters shall be pleated type, 2" thick, and of the sizes as indicated on the plans, or sized to be below maximum allowable pressure drop at design airflow.

The 100% synthetic gradient filter media shall be continuously bonded to the support grid with an effective open area of 96%. Media shall be resistant to a wide range of chemicals, shall not absorb moisture, and shall not support microbial growth. Filter support grid shall be 30 gage galvanized expanded metal grid.

Pleat spacing shall maximize the surface area and dust holding capacity. Filter shall have 16 pleats per linear foot.

The filter frame shall prevent pleat collapse and filter bowing. Frame shall be moisture resistant double wall.

Maximum temperature rating shall be 180 °F for continuous service. Filter shall be resistant for humidity levels up to 100% RH.

Filters shall have a minimum MERV rating of 7 in accordance with ASHRAE 52.2.

Filters shall be equal to Flanders.

## LOUVERS

Louvers shall be wind-driven, rain resistant type and AMCA 550 and 540 rated equal to Ruskin EME3625MD. Furnish and install louvers as hereinafter specified where shown on plans. Louvers shall have a drain gutter in each blade and downspouts in jambs and mullions. Stationary double drainable horizontal blades shall be contained within a single 5" deep frame. Louver components (heads, jambs, sills, blades, and mullions) shall be factory assembled by the louver section to provide overall sizes required.

Construction shall be of extruded aluminum allow as follows:

Frame:	0.081" wall thickness
Blades:	0.081" wall thickness; 2" on center; sight-proof (44% free area based on 48"x48" test size); horizontally mounted
Screen:	5/8" x 0.040" expanded, flattened aluminum in removable frame

Pressure drop shall not exceed 0.10" w.g. at design airflow.

Provide with bird-screen by louver manufacturer. Screen mesh opening size shall be in accordance with 2021 IMC.

Submittals - Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of louver assembly.

Finish - High Performance Organic Finish (Baked Enamel): Provide factory applied, baked-on 3 coat fluoropolymer finish complying with AAMA 2604-05 and containing not less than 50% PVDF resin by weight in both color and clear top-coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions. Color and gloss to be selected by Architect from manufacturer's full color range.

Published louver performance data bearing the AMCA Certified Ratings Seal for Air Performance & Water Penetration shall be submitted for approval.

Acceptable louver manufacturers shall be: Ruskin, Greenheck, American Warming, Pottorff, Nailor-Hart, Arrow United Industries.

## AIR PURIFICATION DEVICE (Bi-polar Ionization)

### Quality Assurance

The air purification system shall be a product of an established manufacturer in the USA.

A qualified representative from the manufacturer shall be available to inspect the installation of the air purification system(s) to ensure installation in accordance with the manufacturer's recommendation.



Technologies that do not address gas disassociation such as UV lights, powered particulate filters, and/or polarized media filters shall not be allowed. Uni-polar ion generators or plasma particulate filters shall not be allowed.

This project is designed in accordance with ASHRAE Standard 62 IAQ Procedure and shall require the manufacturer to provide Indoor Air Quality calculations using the formulas within ASHRAE 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled with the technology submitted.

The air purification system shall be tested by UL or ETL to prove conformance to UL 867-2007 including the ozone chamber testing and peak ozone test for electronic devices. Manufacturers that achieve UL 867 prior to December 21, 2007 and have not been tested in accordance with the newest UL 867 standard with the ozone amendment shall not be acceptable. All manufacturers shall submit independent UL 867 test data with ozone results to the engineer during the submittal process. All manufacturers shall submit a copy with their quotation. Contractors shall not accept any proposal without the proper ozone testing documentation.

The maximum allowable ozone concentration per the UL 867-2007 chamber test shall be 0.007 PPM. The maximum peak ozone concentration per the UL 867-2007 peak test as measured 2 inches away from the electronic air cleaner's output shall be no more than 0.0042 PPM. Manufacturers with ozone output exceeding these ozone values shall not be acceptable.

#### Submittals

Submit manufacturer's technical product data for ion generators including:

Schedule of plasma generators indicating unit designation, number of each type required for each unit/application.

Data sheet for each type of plasma generator, and accessory furnished; indicating construction, sizes, and mounting details.

Performance data for each type of plasma device furnished.

Indoor Air Quality calculations using the formulas within ASHRAE 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled.

Product drawings detailing all physical, electrical, and control requirements.

Copy of UL 867 independent ozone test.

#### Delivery, Storage, & Handling

Deliver in factory shipping containers. Identify on outside of container type of product and location to be installed. Avoid crushing or bending. Store in original cartons and protect from weather and construction work traffic. Store indoors and in accordance with the manufacturer's recommendation for storage.

#### Warranty

Equipment shall be warranted by the manufacturer against defects in material and workmanship for a period of 2 years after shipment. Labor to replace equipment under warranty shall be provided by the installing contractor.

### General

The air purification system(s) shall be of the size, type, arrangement, and capacity indicated and required by the unit furnished and shall be of the manufacturer (or listed equal) specified.

All other suppliers of comparable products requesting prior approval shall submit for prior approval in accordance with the requirements of Section 15100. In addition, supplier shall provide their ASHRAE 62.1-2007 calculations that prove conformance to the ASHRAE Standard with the reduction of outside air to the scheduled values. A letter on the manufacturer's letterhead requesting prior approval must accompany the request for prior approval stating their calculations are ASHRAE compliant. A third party validation study performed on a previous installation of the same application shall also be included. Provide independent test data from ETL or UL showing ozone levels produced during the UL 867 ozone chamber test. Manufacturers without this test data shall not be acceptable.

### Design & Performance Criteria

Each piece of air handling equipment, so designated on the plans, details, equipment schedules, and/or specifications shall contain a plasma generator with bi-polar ionization output as described herein.

The bi-polar ionization system shall be capable of:

Effectively killing microorganisms downstream of the bi-polar ionization equipment (mold, bacteria, virus, etc.).

Controlling gas phase contaminants generated from human occupants, building structure and furnishings.

Capable of reducing static space charges.

Increasing the interior ion levels, both positive and negative, to a minimum of 800 ions/cm<sup>3</sup> measured 5 feet from the floor.

The bi-polar ionization system shall operate in a manner such that equal amounts of positive and negative ions are produced. Uni-polar ion devices shall not be acceptable.

Air exchange rates may vary through the full operating range of a constant volume or VAV system. The quantity of air exchange shall not be increased due to the requirements of the air purification system.

The air purification device shall not have maximum velocity profile.

Plasma generators shall not require preheat protection when the relative humidity of the entering air exceeds 85%. Relative humidity from 0-100% condensing shall not cause damage, deterioration, or dangerous conditions within the air purification system. Air purification system shall be capable of wash down duty.

### Equipment Requirements: Electrode specifications

Each Plasma generator with bi-polar ionization output shall include the required number of electrodes and power generators sized to the air handling equipment capacity. Unit shall be capable of treating 6,000 cfm. Bi-polar ionization tubes manufactured of glass and steel mesh shall not be allowed due to replacement requirement, maintenance, performance

reduction over time, ozone production and corrosion.

Electrodes shall be energized when the main unit disconnect is turned on and the fan is operating. Electrodes shall be made from carbon fiber to prevent oxidation over time.

Electrode pair shall provide a minimum of 140 million ions per cubic centimeter, both positive and negative ions in equal quantities. Devices providing less than the rated ion densities shall not be acceptable.

#### Air Handler Mounted Units

Where so indicated on the plans and/or schedules, plasma generators shall be provided and installed. The mechanical contractor shall mount the plasma generator and wire it to the AHU control power (24 VAC) as instructed by the air purification manufacturer's instructions or line voltage subject to power available. Each unit shall be designed with in integral illuminated LED and dry contacts to prove ion output is operating properly. The dry contacts shall close to prove the ion generator is working properly and may be daisy chained in series such that only one dry contact per AHU is required to interface to the BAS or the optional DDC controller. Dry contacts proving power has been applied in lieu of the ion output is actually operating are not acceptable.

#### Plenum/Duct Mounted Units

Where so indicated on the plans and/or schedules, plasma generators shall be provided and installed. The generator shall be installed through the duct wall and into the airstream with the external power head in a convenient location for visual indication of power, removal and servicing, by the mechanical contractor. The dry contacts shall close to prove the ion generator is working properly and may be daisy chained in series such that only one dry contact per duct is required to interface to the BAS or the optional DDC controller.

#### Ionization Requirements

Plasma generators with bi-polar ionization output shall be capable of controlling gas phase contaminants and shall be provided for all equipment listed above.

The bi-polar ionization system shall consist of bi-polar plasma generator and power supply. The bi-polar system shall be installed where indicated on the plans or specified to be installed and powered by 24 VAC.

The ionization output shall be controlled such that an equal number of positive and negative ions are produced. Imbalanced levels shall not be acceptable.

Ionization output from each electrode shall be a minimum of 140 million ions/cc when tested at 1" from the ionization generator.

All manufacturers shall provide documentation by an independent NELEC accredited laboratory that proves the product has minimum kill rates for the following pathogens given the allotted time and in a space condition:

MRSA - >96% in 30 minutes or less

E.Coli - >99% in 15 minutes or less

TB - >69% in 60 minutes or less

C.diff - >86% in 30 minutes or less

Manufacturers not providing the equivalent space kill rates shall not be acceptable. All manufacturers requesting prior approval shall provide to the engineer independent test data from a NELEC accredited independent lab confirming kill rates and time meeting the minimum requirements stated above. Products tested only on Petri dishes to prove kill rates shall not be acceptable.

The operation of the electrodes or bi-polar ionization units shall conform to UL 867-2007 with respect to ozone generation. There shall be no ozone generation during any operating condition, with or without airflow.

#### Electrical Requirements

Wiring, conduit, and junction boxes shall be installed within housing plenums in accordance with NEC NFPA 70. The contractor shall coordinate electrical requirements with the air purification manufacturer during submittals.

#### Control Requirements

All plasma generators shall have internal short circuit protection, overload protection, and automatic fault reset.

Integral airflow sensing shall modulate the plasma output as the airflow varies or stops. A mechanical airflow switch shall not be acceptable as a means to activate the plasma device due to high failure rates and possible pressure reversal.

The installing contractor shall mount and wire the plasma device within the air handling unit specified or as shown on plans. The contractor shall follow all manufacturer IOM instructions during installation.

All plasma devices shall have a means to interface with the BAS system. Dry contacts shall be provided to prove there are ions being produced. Systems providing indication that power is applied to the plasma device, but not directly sensing the power at the ion output shall not be acceptable.

Plasma systems that use multiple modules with ion output alarm wires wired to the same terminal such that all ion modules must fail to show an alarm status shall not be acceptable.

#### Execution

The Contractor shall be responsible for maintaining all air systems until the Owner accepts the building.

All equipment shall be assembled and installed in a workman like manner to the satisfaction of the Owner, Architect, and Engineer.

Any material damaged by handling, water, or moisture shall be replaced by the mechanical contractor at no cost to the Owner.

All equipment shall be protected from dust and damage on a daily basis throughout construction.

Provide the manufacturer's recommended electrical tests.

A manufacturer's authorized representative shall provide start-up supervision and training of Owner's personnel in the proper operation and maintenance of all equipment.

Acceptable manufacturers shall be Top Product Innovations, Global Plasma Solutions, or approved equal.

### PART 3 - EXECUTION

#### TESTING AND BALANCING

The heating and ventilating subcontractor shall submit to the Owner a record of the capacities of each grille, register, diffuser, and equipment opening as determined by the test after final adjustments have been made with a notation for the final setting and average velocity through each outlet as determined by readings of a velometer taken at several points at the face of the register or opening. Air delivery through supply outlets shall be considered equal to that quantity as published in the manufacturer's tables. Return air through return air grilles shall be considered as equal to the product of the velometer velocity and effective area of the register.

Thermostats for the air conditioning equipment shall be provided as part of that equipment, connected up by the electrical subcontractor, and be tested by the HVAC subcontractor.

The following systems shall be tested at pressures indicated:

Drain piping	10 psi
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All tests shall be verified by a test record maintained on the site and witnessed by the signature of inspector.

Any portion of system failing to pass test shall be retested until proven acceptable.

#### GUARANTEE

The Contractor shall guarantee, in writing, the entire system when completed to be free from any and all defects and shall guarantee the entire system, controls, and other equipment against defective materials and workmanship for a period of one (1) year from date of completion and acceptance.

Upon receipt of notice from the Owner of the failure or any part of the guaranteed equipment during the guarantee period, the affected part or parts shall be promptly repaired or replaced with new parts by and at the expense of the Contractor.

Under the guarantee clause, the Contractor shall include free routine maintenance for a period of one (1) year from the date of final acceptance. At the end of one year of operation, the mechanical contractor shall inspect and repair any problems which may exist. Contractor shall lubricate bearings, adjust or replace belts, replace filters, and provide all necessary preventative and corrective maintenance required. Contractor shall provide Engineer with a table identifying each air handler unit model and serial number, quantity and size of filters, filter manufacturer and efficiency, belt manufacturer and size,

motor HP, frame, and power supply.

#### CLEANING VENTILATING SYSTEMS

All ducts shall be thoroughly cleaned and blown out to prevent any debris from damaging fan wheels or discharging through diffusers when systems are placed in operations. All temporary connections required for blowing out the system, cheesecloth for all duct openings, and any other equipment or labor for cleaning shall be provided by the heating and ventilating subcontractor. All filters shall be renewed after ventilating systems have been cleaned. The cost of renewal shall be borne by the General Contractor.

END OF SECTION 15800

## SECTION 15900 - TEMPERATURE CONTROL SYSTEM

### PART 1 – GENERAL

#### DESCRIPTION OF WORK

The automatic temperature controls (ATC) portion of this project will be provided under Section 15950. Subject to section 15950 specifications, the controls shall be as manufactured by Siemens ONLY for tie-in to the existing Siemens system previously installed throughout Baldwin County schools. Controls shall be provided and installed under the supervision of the ATCS contractor responsible for warranty and servicing of the system.

The automatic temperature controls (ATC) portion of this project as specified under Section 15950 shall be bid to and included in the base bid direct to the General Contractor.

#### COORDINATION

It shall be the Division 15000 contractor's responsibility to include all costs in his bid, associated with the controls work. These shall include but not be limited to the following:

Providing and installation of all dampers and blank offs as required.

Installation of sensor wells for ATC sensors or meters.

Installation of Air Flow Measuring stations and dampers

Starters with control transformers and HOA switches as specified in the mechanical sections.

Mounting of DDC box controllers

END OF SECTION 15900

## SECTION 15950 – EMCS & DDC

### PART 1 – GENERAL

#### WORK INCLUDED

General: Building Management System (BMS) Contractor shall provide and install:

Complete temperature control system to be DDC with electric actuation as specified herein.

All wiring, conduit, panels, and accessories for a complete operational system.

BMS Contractor shall be responsible for all electrical work associated with the BMS.

Perform all wiring in accordance with all local and national codes.

Install all line voltage wiring, concealed or exposed, in conduit in accordance with the Division 16 specifications, NEC and local building code.

Provide extension of 120 volt, 20 amp circuits and circuit breakers from Emergency power panels for all BMS equipment power. Provide and install local UPS Power supply for all BMS system panels and equipment.

Surge transient protection shall be incorporated in design of system to protect electrical components in all DDC Controllers and operator's workstations.

All low voltage electrical control wiring throughout the building whether in exposed areas shall be run in conduit in accordance with the Division 16 specifications, local building code and the NEC.

Provide system graphics for each controlled device and/or integrated systems as required by the owner. Origin of information shall be transparent to the operator and shall be controlled, displayed, trended, etc. as if the points were hardwired to the BMS.

#### GENERAL PRODUCT DESCRIPTION

The installation of the control system shall be performed under the direct supervision of the controls manufacturer with the shop drawings, flow diagrams, bill of materials, component designation, or identification number and sequence of operation all bearing the name of the manufacturer. The installing manufacturer shall certify in writing, that the shop drawings have been prepared by the equipment manufacturer and that the equipment manufacturer has supervised their installation. In addition, the equipment manufacturer shall certify, in writing, that the shop drawings were prepared by their company and that all temperature control equipment was installed under their direct supervision.

All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed specially for this project. All systems and components shall have been thoroughly tested and proven in actual use for at least two years.

The system shall be scalable in nature and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, DDC Controllers, and operator



devices.

System architectural design shall eliminate dependence upon any single device for alarm reporting and control execution. Each DDC Controller shall operate independently by performing its own specified control, alarm management, operator I/O, and data collection. The failure of any single component or network connection shall not interrupt the execution of any control strategy, reporting, alarming and trending function, or any function at any operator interface device.

DDC Controllers shall be able to access any data from, or send control commands and alarm reports directly to, any other DDC Controller or combination of controllers on the network without dependence upon a central or intermediate processing device. DDC Controllers shall also be able to send alarm to multiple operator workstations without dependence upon a central or intermediate processing device.

DDC Controllers shall be able to assign password access and control priorities to each point individually. The log-on password (at any PC workstation or portable operator terminal) shall enable the operator to monitor, adjust or control only the points that the operator is authorized for. All other points shall not be displayed at the PC workstation or portable terminal. (e.g., all base building and all tenant points shall be accessible to any base building operators, but only certain base building and tenant points shall be accessible to tenant building operators). Passwords and priority levels for every point shall be fully programmable and adjustable.

#### RELATED SECTIONS

The General Conditions of the Contract, Supplementary Conditions, and General Requirements are part of this specification and shall be used in conjunction with this section as part of the contract documents.

The following sections constitute related work:

Section 15100 – General Requirements  
Section 15200 – Testing, Adjusting, and Balancing for HVAC  
Section 15400 – Plumbing  
Section 15800 – HVAC  
Section 15995 – Commissioning of HVAC Systems  
Section 16100 -- Electrical  
Section 16720 – Fire Detection and Alarm Systems

#### APPROVED CONTROL SYSTEM CONTRACTORS & MANAGERS

The following are the only acceptable Control System Products:

Siemens APOGEE Automation System  
Siemens TALON Automation System

The following are the approved Control System Contractors:

**Engineered Cooling Services – Product Line: Siemens TALON**

Control Vendor Contact: Alessa Smith (850) 512-2321  
Bobby Marcus, P.E. (850) 393-3300

**Siemens Industry, Inc. – Product Line: Siemens APOGEE**

Approved Equal; Must obtain approval prior to submitting bid

**The new BAS system installed shall communicate to the Existing Baldwin County Board of Education Tridium N4 Supervisor Graphical Workstation**

The new BAS system shall include a Tridium N4 Jace with required device licenses and a Three (3) year Service Maintenance Agreement (SMA).

The new BAS system shall include an additional Jace Niagara connection for the existing Supervisor.

All graphics for new BAS system shall be developed for the Tridium N4 Jace. Graphics should include individual graphics for each piece of equipment, floorplans, and any integrated equipment.

**QUALITY ASSURANCE**

The BAS system shall be designed and installed, commissioned and serviced by factory trained personnel. BAS contractor shall be Siemens Value Added Partner or Siemens Branch. BMS contractor shall have an in-place support facility within 100 miles of the site with technical staff, spare parts inventory and necessary test and diagnostic equipment. The BMS contractor shall provide full time, on site, experienced project manager for this work, responsible for direct supervision of the design, installation, start up and commissioning of the BMS. The Bidder shall be regularly engaged in the installation and maintenance of BMS systems and shall have a minimum of ten (10) years of demonstrated technical expertise and experience in the installation and maintenance of BMS systems similar in size and complexity to this project.

The BMS contractor shall have a minimum of Three (3) Tridium N4 Certified technicians and Three (3) Siemens Certified technicians.

The BMS contractor shall maintain a service organization consisting of factory trained service personnel and provide a list of ten (10) projects, similar in size and scope to this project, completed within the last five years.

Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be manufacturer's latest standard design that complies with the specification requirements.

All BAS peer-to-peer network controllers, central system controllers, and local user displays shall be UL Listed under Standard UL 916, category PAZX; Standard ULC C100, category UUKL7; and under Standard UL 864, categories UUKL, UDTZ, and QVAX and be so listed at the time of bid. All field level controllers shall comply with UL Standard UL 864 category UUKL; Standard UL 864, categories UDTZ, and QVAX and be so listed at the time of Bid.

The BAS peer-to-peer network controllers and local user display shall also comply with the European Electromagnetic Compatibility (EMC) Framework, and bear the C-Tic Mark to show compliance. The purpose of the regulation is to minimize electromagnetic interference between electronic products, which may diminish the performance of electrical products or disrupt essential communications.

DDC peer-to-peer controllers shall be compliant with the European EMC Directive, Standards EN 50081-2 and EN 50082-2, at the Industrial Levels. Additionally the equipment shall be compliant with the European LVD Directive and bear the CE mark in order to show compliance to both directives.

All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.

The manufacturer of the building automation system shall provide documentation supporting compliance with ISO-9002 (Model for Quality Assurance in Production, Installation, and Servicing) and ISO-140001 (The application of well-accepted business management principles to the environment). The intent of this specification requirement is to ensure that the products from the manufacturer are delivered through a Quality System and Framework that will assure consistency in the products delivered for this project.

### CODES & STANDARDS

Work, materials, and equipment shall comply with the most restrictive of local, state, and federal authorities' codes and ordinances or these plans and specifications. As a minimum, the installation shall comply with current editions in effect 30 days prior to receipt of bids of the following codes:

National Electric Code (NEC)  
International Building Code (IBC) - 2021  
International Mechanical Code (IMC) - 2021  
[Local] Building Code

### SUBMITTALS

Product Submittal Requirements. Meet requirements of Section 15100 on Shop Drawings, Product Data, and Samples. Provide six copies of shop drawings and other submittals on hardware, software, and equipment to be installed or furnished. Begin no work until submittals have been approved for conformity with design intent. Provide drawings as AutoCAD compatible files in electronic format (file format: .dwg, .dxf, .vsd, or comparable) or hard copies on 11 x 17 prints of each drawing. When manufacturer's cutsheets apply to a product series rather than a specific product, clearly indicate applicable data by highlighting or by other means. Clearly reference covered specification and drawing on each submittal. General catalogs shall not be accepted as cut sheets to fulfill submittal requirements. Select and show submittal quantities appropriate to scope of work.

Provide submittals within 4 weeks of contract award.

Submittal data shall consist of the following:

Direct Digital Control System Hardware

Complete bill of materials indicating quantity, manufacturer, model number, and relevant technical data of equipment to be used.

Manufacturer's description and technical data, such as product specification sheets, installation and maintenance instructions for items listed below and for relevant items not listed below:

Direct Digital Controllers (controller panels)

Transducers and Transmitters

Sensors (including accuracy data)

Valves

Dampers

Relays and Switches

Control Panels

Power Supplies

Operator Interface Equipment

Wiring diagrams and layouts for each control panel. Show all termination numbers.

Controlled Systems

Riser diagrams showing control network layout, communication protocol, and wire types.

Schematic diagram of each controlled system. Label control points with point names. Graphically show locations of control elements.

Schematic wiring diagram of each controlled system. Label control elements and terminals. Where a control element is also shown on control system schematic use the same name.

Instrumentation list for each controlled system. List control system element in a table. Show element name, type of device, manufacturer, model number, and product data sheet number.

Complete description of control system operation including sequences of operation. Include and reference schematic diagram of controlled system.

Point list for each system controller including both inputs and outputs (I/O), point numbers, controlled device associated with each I/O point, and location of I/O device.

Description of process, report formats and checklists to be used in the *Control System Demonstration and Acceptance* section in *PART 3 – EXECUTION* of this specification.

Contractor shall submit documentation in the following phased delivery schedule:

Valve and damper schedules

Point Naming Convention

Sample Graphics

System Schematics, including:

System Riser Diagrams  
Sequence of Operations  
Mechanical Control Schematics  
Electrical Wiring Diagrams  
Control Panel Layouts  
Product Specification Sheets  
As-Built drawings

#### Project Record Documents

Submit three (3) copies of record (as-built) documents upon completion of installation. Submittal shall consist of:

Project Record Drawings. As-built versions of the submittal shop drawings provided as AutoCAD compatible files in electronic format and as 11 x 17 inch prints.

Testing and Commissioning Reports and Checklists. Completed versions of reports, checklists, and trend logs used to meet requirements in the *Control System Demonstration and Acceptance* section in *PART 3 – EXECUTION* of this specification.

Certification of pressure test required in the *Control Air Tubing* section in *PART 3 – EXECUTION* of this specification.

Operation and Maintenance (O & M) Manual.

As-built versions of the submittal product data.

Names, addresses, and 24-hour telephone numbers of installing contractors and service representatives for equipment and control systems.

Operator's Manual with procedures for operating control systems, logging on and off, handling alarms, producing point reports, trending data, overriding computer control, and changing setpoints and variables.

Programming manual or set of manuals with description of programming language and of statements for algorithms and calculations used, of point database creation and modification, of program creation and modification, and of editor use.

Engineering, installation, and maintenance manual or set of manuals that explains how to design and install new points, panels, and other hardware; how to perform preventive maintenance and calibration; how to debug hardware problems; and how to repair or replace hardware.

Documentation of all programs created using custom programming language, including setpoints, tuning parameters, and object database.

Graphic files, programs, and database on electronic media..

List of recommended spare parts with part numbers and suppliers.

Complete original-issue documentation, installation, and maintenance information for furnished third-party hardware, including computer equipment and sensors.

Complete original original-issue copies of furnished software, including operating systems, custom programming language, operator workstation software, and graphics software.

Licenses, guarantees, and warranty documents for equipment and systems.

#### WARRANTY

Warrant labor and materials for specified control system free from defects for a period of 12 months after final acceptance. Failures on control systems that include all computer

equipment, transmission equipment and all sensors and control devices during warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to Owner. Respond during normal business hours within 24 hours of Owner's warranty service request.

Work shall have a single warranty date, even if Owner receives beneficial use due to early system start-up. If specified work is split into multiple contracts or a multi-phase contract, each contract or phase shall have a separate warranty start date and period.

If Engineer determines that equipment and systems operate satisfactorily at the end of final start-up, testing, and commissioning phase, Engineer will certify in writing that control system operation has been tested and accepted in accordance with the terms of this specification. Date of acceptance shall begin warranty period.

Provide updates to operator workstation software, project-specific software, graphic software, database software, and firmware that resolve Contractor identified software deficiencies at no charge during warranty period. If available, Owner can purchase in-warranty service agreement to receive upgrades for functional enhancements associated with the above-mentioned items. Do not install updates or upgrades without Owner's written authorization.

#### Exception

Contractor shall not be required to warrant reused devices, except those that have been rebuilt or repaired. Installation labor and materials shall be warranted. Demonstrate operable condition of reused devices at time of Engineer's acceptance.

Contractor shall not be required to warrant systems, equipment and devices or software if the damages and/or failures were caused by lack of training, unauthorized use, negligence or deliberate action of other parties, or job site conditions.

#### OWNERSHIP & PROPRIETARY MATERIAL

Project specific software and documentation shall become Owner's property. This includes, but not limited to:

Graphics  
Record drawings  
Database  
Application programming code  
Project Specific Documentation shall become Owner's property.

#### General

Submit four (4) copies of owner's manuals upon completion of project.

Submit two (2) electronic copies of complete as-built documentation. All drawings shall be in standard AutoCad format, other documentation shall be in standard MS Office format.

Update manuals with modifications made to system during guarantee period. Provide replacement pages or supplements in quantity stated above for "as-built" manuals.

Operating manual to serve as training and reference manual for all aspects of day-to-day operation of the system. As a minimum include the following:

Sequence of operation for automatic and manual operating modes for all building systems. The sequences shall cross-reference the system point names.

Description of manual override operation of all control points in system.  
BMS system manufacturers complete operating manuals.

Provide maintenance manual to serve as training and reference manual for all aspects of day-to-day maintenance and major system repairs. As a minimum include the following:

Complete as-built installation drawings for each building system.

Overall system electrical power supply schematic indicating source of electrical power for each system component. Indicate all battery backup provisions.

Photographs and/or drawings showing installation details and locations of equipment.

Routine preventive maintenance procedures, corrective diagnostics troubleshooting procedures, and calibration procedures.

Parts list with manufacturer's catalog numbers and ordering information.

Lists of ordinary and special tools, operating materials supplies and test equipment recommended for operation and servicing.

Manufacturer's operation, set-up, maintenance and catalog literature for each piece of equipment.

Maintenance and repair instructions.

Recommended spare parts.

Provide Programming Manual to serve as training and reference manual for all aspects of system programming. As a minimum include the following:

Complete programming manuals, and reference guides.

Details of any custom software packages and compilers supplied with system.

Information and access required for independent programming of system.

## PART 2 – PRODUCTS

### MATERIALS

All products used in this project installation shall be new and currently manufactured and shall have been applied in similar installations. Do not use this installation as a

product test site unless explicitly approved in writing by Owner or Owner's representative. Spare parts shall be available for at least five years after completion of this contract.

## COMMUNICATION

The design of the BMS shall support networking of operator workstations and Building Controllers. The network architecture shall consist of two levels, an Ethernet based primary network for all operator workstations, servers, and primary DDC controllers along with secondary Floor Level Networks (FLN) for terminal equipment application specific controllers.

Access to system data shall not be restricted by the hardware configuration of the building management system. The hardware configuration of the BMS network shall be totally transparent to the user when accessing data or developing control programs.

### Primary Network - Panel to Panel Communication

All Building Controllers shall directly reside on the primary Ethernet network so that communications may be executed directly between Building Controllers, directly between server and Building Controllers on a peer-to-peer basis.

Systems that operate via polled response or other types of protocols that rely on a central processor, file server, or similar device to manage panel-to-panel or device-to-device communications shall not be acceptable.

All operator interfaces shall have the ability to access all point status and application report data or execute control functions for any and all other devices. Access to data shall be based upon logical identification of building equipment. No hardware or software limits shall be imposed on the number of devices with global access to the network data.

The primary network shall use TCP/IP over Ethernet. All devices must:

Auto-sense 10/100 Mbps networks.

Receive an IP Address from a Dynamic Host Configuration Protocol (DHCP) Server or be configured with a Fixed IP Address.

Resolve Name to IP Addresses for devices using a Domain Name Service (DNS) Server on the Ethernet network.

Allow MMI access to an individual Primary Network Controller using industry standard Telnet software to view and edit entire Primary Network.

The primary network shall provide the following minimum performance:

Provide high-speed data transfer rates for alarm reporting, report generation from multiple controllers and upload/download efficiency between network devices. System performance shall insure that an alarm occurring at any Building Controller is displayed at any PC workstations, all Building Controllers, and other alarm printers within 15 seconds.

Message and alarm buffering to prevent information from being lost.

Error detection, correction, and re-transmission to guarantee data integrity.



Synchronization of real-time clocks between Building Controllers, including automatic daylight savings time corrections.

The primary network shall allow the Building Controllers to access any data from, or send control commands and alarm reports directly to, any other Building Controller or combination of controllers on the network without dependence upon a central or intermediate processing device. Building Controllers shall send alarm reports to multiple operator workstations without dependence upon a central or intermediate processing device. The network shall also allow any Building Controller to access, edit, modify, add, delete, back up, restore all system point database and all programs.

The primary network shall allow the Building Controllers to assign password access and control priorities to each point individually. The logon password (at any PC workstation or portable operator terminal) shall enable the operator to monitor, adjust and control only the points that the operator is authorized for. All other points shall not be displayed at the PC workstation or portable terminal. (e.g., all base building and all tenant points shall be accessible to any base building operators, but only certain base building and tenant points shall be accessible to tenant building operators). Passwords and priorities for every point shall be fully programmable and adjustable.

Devices containing custom programming must reside on the Primary Network.

#### Secondary Network – Application Specific Controller Communication

Communication over the secondary network shall be BACnet MS/TP protocol.

This level communication shall support a family of application specific controllers for terminal equipment.

The Application Specific Controllers shall communicate bi-directionally with the primary network through Building Controllers for transmission of global data.

A maximum of 50 terminal equipment controllers may be configured on individual secondary networks to ensure adequate global data and alarm response times.

#### BUILDING CONTROLLER SOFTWARE

Furnish the following applications software to form a complete operating system for building and energy management as described in this specification.

The software programs specified in this Section shall be provided as an integral part of Building Controllers and shall not be dependent upon any higher level computer or another controller for execution.

All points, panels and programs shall be identified by a 30-character name. All points shall also be identified by a 16-character point descriptor. The same names shall be displayed at both Building Controller and the Operator Interface.

All digital points shall have a user defined two-state status indication with 8 characters minimum (e.g., Summer, Enabled, Disabled, Abnormal).

Building Controllers shall have the ability to perform energy management routines

including but not limited to time of day scheduling, calendar-based scheduling, holiday scheduling, temporary schedule overrides, start stop time optimization, automatic daylight savings time switch over, night setback control, enthalpy switch over, peak demand limiting, temperature-compensated duty cycling, heating/cooling interlock, supply temperature reset, priority load shedding, and power failure restart.

The Building Controllers shall have the ability to perform the following pre tested control algorithms:

- Two position control
- Proportional control
- Proportional plus integral control
- Proportional, integral, plus derivative control
- Automatic tuning of control loops
- Model-Free Adaptive Control

Each controller shall be provided with an interactive HELP function to assist operators using POTs and remote connected operators.

### SYSTEM SECURITY

User access shall be secured using individual security passwords and user names.

Passwords shall restrict the user to the objects, applications, and system functions as assigned by the system manager.

User Log On/Log Off attempts shall be recorded.

The system shall protect itself from unauthorized use by automatically logging off following the last keystroke. The delay time shall be user-definable.

Use of workstation resident security as the only means of access control is not an acceptable alternative to resident system security in the field panel.

### USER DEFINED CONTROL APPLICATIONS

Controllers shall be able to execute custom, job-specific processes defined by the user, to automatically perform calculations and special control routines.

It shall be possible to use any system measured point data or status, any system calculated data, a result from any process, or any user-defined constant in any controller in the system.

Any process shall be able to issue commands to points in any and all other controllers in the system.

Processes shall be able to generate operator messages and advisories to other operator I/O devices. A process shall be able to directly send a message to a specified device or cause the execution of a dial-up connection to a remote device such as a printer or pager.

Each controller shall support plain language text comment lines in the operating program to allow for quick troubleshooting, documentation, and historical summaries of program development.

Controller shall provide a HELP function key, providing enhanced context sensitive on-line help with task oriented information from the user manual.

## ALARM MANAGEMENT

Alarm management shall be provided to monitor and direct alarm information to operator devices. Each Building Controller shall perform distributed, independent alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, minimize network traffic and prevent alarms from being lost. At no time shall the Building Controllers ability to report alarms be affected by either operator or activity at a PC workstation, local I/O device or communications with other panels on the network.

Conditional alarming shall allow generation of alarms based upon user defined multiple criteria.

An Alarm "shelving" feature shall be provided to disable alarms during testing. (Pull the Plug, etc.).

Binary Alarms. Each binary object shall be set to alarm based on the operator-specified state. Provide the capability to automatically and manually disable alarming.

Analog Alarms. Each analog object shall have both high and low alarm limits. Alarming must be able to be automatically and manually disabled.

All alarm or point change reports shall include the point's user defined language description and the time and date of occurrence.

The user shall be able to define the specific system reaction for each point. Alarms shall be prioritized to minimize nuisance reporting and to speed operator response to critical alarms. A minimum of six priority levels shall be provided for each point. Point priority levels shall be combined with user definable destination categories (PC, printer, Building Controller, etc.) to provide full flexibility in defining the handling of system alarms. Each Building Controller shall automatically inhibit the reporting of selected alarms during system shutdown and start-up. Users shall have the ability to manually inhibit alarm reporting for each point.

Alarm reports and messages shall be routed to user-defined list of operator workstations, or other devices based on time and other conditions. An alarm shall be able to start programs, print, be logged in the event log, generate custom messages, and display graphics.

In addition to the point's descriptor and the time and date, the user shall be able to print, display or store a 200-character alarm message to more fully describe the alarm condition or direct operator response.

Each Building Controller shall be capable of storing a library of at least 50 alarm

messages. Each message may be assigned to any number of points in the Controller.

Operator-selected alarms shall be capable of initiating a call to a remote operator device.

## SCHEDULING

Provide a comprehensive menu driven program to automatically start and stop designated object or group of objects in the system according to a stored time.

Schedules shall reside in the building controller and shall not rely on external processing or network.

It shall be possible to define a group of objects as a custom event (i.e., meeting, athletic activity, etc.). Events can then be scheduled to operate all necessary equipment automatically.

For points assigned to one common load group, it shall be possible to assign variable time delays between each successive start and/or stop within that group.

The operator shall be able to define the following information:

Time, day

Commands such as on, off, auto, etc.

Time delays between successive commands.

There shall be provisions for manual overriding of each schedule by an authorized operator.

It shall be possible to schedule calendar-based events up to one year in advance based on the following:

**Weekly Schedule:** Provide separate schedules for each day of the week. Each of these schedules should include the capability for start, and stop, optimal start, optimal stop, and night economizer. When a group of objects are scheduled together as an Event, provide the capability to adjust the start and stop times for each member.

**Exception Schedules:** Provide the ability for the operator to designate any day of the year as an exception schedule. Exception schedules may be defined up to a year in advance. Once an exception schedule is executed, it will be discarded and replaced by the standard schedule for that day of the week.

**Holiday Schedules:** Provide the capability for the operator to define up to 99 special or holiday schedules. These schedules may be placed on the scheduling calendar and will be repeated each year. The operator shall be able to define the length of each holiday period.

**Automatic Daylight Savings Time Switchover:** The system shall provide automatic time adjustment for switching to/from Daylight Savings Time.

**Night setback control:** The system shall provide the ability to automatically adjust setpoints for night control.

**Loop Control:** A Model-Free Adaptive Control algorithm or alternatively a PID (proportional-integral-derivative) closed-loop control algorithm with direct or reverse action and anti-windup shall be supplied. The algorithm shall calculate a time-varying

analog value that is used to position an output or stage a series of outputs. The controlled variable, setpoint, and weighting parameters shall be user-selectable.

#### Sequencing

Provide application software based upon the sequences of operation specified to properly sequence equipment.

#### Staggered Start

This application shall prevent all controlled equipment from simultaneously restarting after a power outage. The order in which equipment (or groups of equipment) is started, along with the time delay between starts, shall be user definable.

Upon the resumption of power, each Building Controller shall analyze the status of all controlled equipment, compare it with normal occupancy scheduling and turn equipment on or off as necessary to resume normal operations.

#### Totalization

Run-Time Totalization: Building Controllers shall automatically accumulate and store run-time hours for all digital input and output points. A high runtime alarm shall be assigned, if required, by the operator.

Consumption totalization: Building Controllers shall automatically sample, calculate and store consumption totals on a daily, weekly or monthly basis for all analog and digital pulse input type points.

Event totalization: Building Controllers shall have the ability to count events such as the number of times a pump or fan system is cycled on and off. Event totalization shall be performed on a daily, weekly or monthly basis for all points. The event totalization feature shall be able to store the records associated with events before reset.

#### Data Collection

A variety of historical data collection utilities shall be provided to manually or automatically sample, store, and display system data for all points.

Building Controllers shall store point history data for selected analog and digital inputs and outputs.

Any point, physical or calculated may be designated for trending. Any point, regardless of physical location in the network, may be collected and stored in each Building Controllers point group.

Trend data shall be stored at the Building Controllers and uploaded to the workstation when retrieval is desired. Uploads shall occur based upon either user-defined interval, manual command or when the trend buffers are full. All trend data shall be available for use in third-party personal computer applications.

Loop Tuning: Building Controllers shall also provide high resolution sampling capability for verification of DDC control loop performance. Documented evidence of tuned control loop performance shall be provided on a <monthly, seasonal, quarterly, annual> period.

For Model-Free Adaptive Control loops, evidence of tuned control loop performance shall be provided via graphical plots or trended data logs. Graphical plots shall minimally include depictions of setpoint, process variable (output), and control variable (e.g., temperature). Other parameters that may influence loop control shall also be included in the plot (e.g., fan on/off, mixed-air temperature).

For PID control loops, operator-initiated automatic and manual loop tuning algorithms shall be provided for all operator-selected PID control loops. Evidence of tuned control loop performance shall be provided via graphical plots or trended data logs for all loops. In automatic mode, the controller shall perform a step response test with a minimum one-second resolution, evaluate the trend data, calculate the new PID gains and input these values into the selected LOOP statement.

Loop tuning shall be capable of being initiated either locally at the Building Controller, from a network workstation or remotely using dial-in modems. For all loop tuning functions, access shall be limited to authorized personnel through password protection.

### BUILDING CONTROLLERS

Building Controllers shall be 32-bit, multi-tasking, multi-user, real-time 100 MHz digital control processors consisting of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules. Controller size shall be sufficient to fully meet the requirements of this specification and the attached point list.

Each Building Controller shall have sufficient memory, a minimum of 24 megabyte, to support its own operating system and databases, including control processes, energy management applications, alarm management applications, historical/trend data for points specified, maintenance support applications, custom processes, operator I/O, and dial-up communications.

Provide Universal I/O capability, including software configurable universal inputs and universal outputs.

Each Building Controller shall support a minimum of one directly connected Secondary Network.

Building Controller shall have an integral real-time clock.

Each Building Controller shall support firmware upgrades without the need to change hardware.

Each Building Controller shall support:

Monitoring of industry standard analog and digital inputs, without the addition of equipment outside the Building Controller cabinet.

Monitoring of industry standard analog and digital outputs, without the addition of equipment outside the Building Controller cabinet.

### Spare Point Capacity

Each Building Controller shall have a minimum of 10 percent spare point capacity.

The type of spares shall be in the same proportion as the implemented I/O functions of the panel, but in no case shall there be less than one spare of each implemented I/O type.

Provide all processors, power supplies, and communication controllers so that the implementation of adding a point to the spare point location only requires the addition of the appropriate:

Expansion modules

Sensor/actuator

Field wiring/tubing

### Serial Communication

Building Controllers shall provide at least two EIA-232C serial data communication ports for operation of operator I/O devices such as industry standard printers, operator terminals, and portable laptop operator's terminals. Building Controllers shall allow temporary use of portable devices without interrupting the normal operation of permanently connected printers or terminals.

### I/O Status and Indication

Building Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device. Graduated intensity LEDs or analog indication of value shall also be provided for each analog output. All wiring connections shall be made to field-removable terminals.

Shall provide I/O modules with LCD's capable of displaying information faults including but not limited to open circuit, short circuit, unreliable input signal, signal under range, and signal over range via informative symbols.

Self Diagnostics. Each Building Controller shall continuously perform self diagnostics, communication diagnosis, and diagnosis of all panel components. The Building Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication for any system.

Power loss. In the event of the loss of power, there shall be an orderly shutdown of all Building Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration data and battery backup shall be provided to support the real-time clock and all volatile memory for a minimum of 30 days..

### Environment

Controller hardware shall be suitable for the anticipated ambient conditions.

Controllers used outdoors and/or in wet ambient conditions shall be mounted within waterproof enclosures and shall be rated for operation at 0°C to 49°C (32°F to 120°F).

Controllers used in conditioned space shall be mounted in dust-proof enclosures and shall be rated for operation at 0°C to 49°C (32°F to 120°F).

Immunity to power and noise.

Controller shall be able to operate at 90% to 110% of nominal voltage rating and shall perform an orderly shutdown below 80% nominal voltage.

Operation shall be protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 1 m (3 ft).

Isolation shall be provided at all primary network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:

RF-Conducted Immunity (RFCl) per ENV 50141 (IEC 1000-4-6) at 3V

Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact

Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500V signal, 1 kV power

Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)

Isolation shall be provided at all Building Controller's AC input terminals to suppress induced voltage transients consistent with:

IEEE Standard 587 1980

UL 864 Supply Line Transients

Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)

#### Local Controller Interface

A local user interface to the controller shall be provided. The interface may be mounted on any building controller and automatically read and initiate commands of local database points without further set-up or configuration. The Controller Interface shall be provided for interrogating and editing data, commanding point values at user defined priorities, viewing and acknowledging alarms, and viewing point monitoring reports. An optional system security password shall be available to prevent unauthorized use of the local controller interface and display.

Minimum Approved Building Controllers.

BMS Contractors shall furnish Building Controllers as listed below. Providing an approved controller does not release the contractor from meeting all performance, software and hardware specifications for Building Controllers and system operations.

Siemens – PXC / TC Compact Controllers, PXC / TC Modular Controllers.



## APPLICATION SPECIFIC CONTROLLERS (ASC)

Provide for control of each piece of equipment, including, but not limited to the following:

### Heat Pumps

Each Building Controller shall be able to communicate with application specific controllers (ASCs) over the Secondary Network to control terminal equipment only.

Each ASC shall operate as a stand-alone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC shall be a microprocessor-based, multi-tasking, real-time digital control processor.

Each ASC shall include all point inputs and outputs necessary to perform the specified control sequences. The ASC shall accept input and provide output signals that comply with industry standards. Controllers utilizing proprietary control output signals shall not be acceptable. Outputs utilized either for two-state, modulating floating, or proportional control, allowing for additional system flexibility.

Space Combination Temperature / Relative Humidity / CO2 Sensors. Each controller performing space temperature control shall be provided with a matching room sensor.

Wired temperature sensor specifications. The sensing element for the space temperature sensor must be IC-based and provide the following.

Digitally communicating with the Application Specific Controller.

### Auxiliary Communication Port

Each room temperature sensor shall include a terminal jack integral to the sensor assembly. RS-232 communications port shall allow the operator to query and modify operating parameters of the local room terminal unit.

### Setpoint Adjustment Dial

The setpoint adjustment function dial shall allow for modification of the temperature by the building operators. Setpoint adjustment may be locked out, overridden, or limited as to time or temperature through software by an authorized operator.

### Override Switch

An override button shall initiate override of the night setback mode to normal (day) operation when activated by the occupant and enabled by building operators. The override shall be limited to two (2) hours (adjustable.) The override function may be locked out, overridden, or limited through software by an authorized operator.

### Communication

Each controller shall perform its primary control function independent of other Secondary Network communication, or if Secondary Network communication is interrupted. Reversion to a fail-safe mode of operation during Secondary Network interruption is not acceptable.

### Control Algorithms

The controller shall receive its real-time data from the Building Controller time clock to ensure Secondary Network continuity. Each controller shall include algorithms incorporating proportional, integral and derivative (PID) gains for all applications. All PID gains and biases shall be field-adjustable by the user via room sensor LCD. Controllers that incorporate proportional and integral (PI) control algorithms only shall not be acceptable.

### Control Applications

Operating programs shall be field-selectable for specific applications. In addition, specific applications may be modified to meet the user's exact control strategy requirements, allowing for additional system flexibility. Controllers that require factory changes of all applications are not acceptable.

### Programmability

Application Specific Controllers shall be programmable, using software provided by the BMS manufacturer. Software shall be field-installable on any standard laptop. Program language shall be text-based and allow up to 200 lines of code for programming. Programming shall allow for changing sequence of operation, commanding and releasing points, additional monitoring, and command priority management within the Application Specific Controller.

### Calibration

Each controller shall include provisions for manual and automatic calibration of the differential pressure transducer in order to maintain stable control and ensuring against drift over time.

Manual calibration may be accomplished by either commanding the actuator to 0% via the POT or by depressing the room sensor override switch. Calibration of the transducer at the controller location shall not be necessary.

Calibration shall be accomplished by stroking the terminal unit damper actuator to a 0% position so that a 0 cfm air volume reading is sensed. The controller shall automatically accomplish this whenever the system mode switches from occupied to unoccupied or vice versa.

Calibration shall be accomplished by zeroing out the pressure sensor and holding damper at last known position until calibration is complete. The controller shall automatically accomplish this whenever the system mode switches from occupied to unoccupied or vice versa.

### Memory

Provide each ASC with sufficient memory to accommodate point databases, operating programs, local alarming and local trending. All databases and programs shall be stored in non-volatile EEPROM, EPROM and PROM, or minimum of 72-hour battery backup shall be provided. The controllers shall be able to return to full normal operation without user intervention after a power failure of unlimited duration.

Upon replacement, new ASCs shall recover control function and site specific defaults automatically and resume normal operation.

### Power Supply

The ASCs shall be powered from a 24 Vac source and shall function normally under an operating range of 18 to 28 Vac, allowing for power source fluctuations and voltage drops. Power supply for the ASC must be rated at a minimum of 125% of ASC power consumption and shall be of the fused or current limiting type. The BMS contractor shall provide 24 Vac power to the terminal units by utilizing:

The existing line voltage power trunk and installing separate isolation transformers for each controller.

Dedicated line voltage power source and isolation transformers at a central location and installing 24 Vac power trunk to supply multiple ASCs in the area.

### Environment

The controllers shall function normally under ambient conditions of 32 to 122°F (0 to 50°C) and 10% to 95% rh (non-condensing). Provide each controller with a suitable cover or enclosure to protect the circuit board assembly.

Immunity to noise. Operation shall be protected against electrical noise of 5-120 Hz and from keyed radios up to 5 W at 1 m (3 ft).

### Controllers for Heat Pump terminals

All Heat Pump terminal control applications shall be field selectable such that a single controller may be used in conjunction with any of the above types of terminal units to perform the specified sequences of control. ASCs that require factory application changes are not acceptable. The Heat Pump terminal ASC shall support the following types of pressure independent terminal boxes as a minimum:

Single-stage heat pump control

Multiple-stage compressor with reversing valve and mixed air

Heating and cooling compressors and mixed air

### INPUT/OUTPUT INTERFACE

Hardwired inputs and outputs may tie into the system through building or application specific controllers.

Modular, "hot-swappable" I/O so that the electronics of a small portion of the I/O can be replaced without effecting the power or communication for the other points.

All input points and output points shall be protected such that shorting of the point to itself, to another point, or to ground will cause no damage to the controller. All input and output points shall be protected from voltage up to 24V of any duration, such that contact with this voltage will cause no damage to the controller.

Binary inputs shall allow the monitoring of On/Off signals from remote devices. The binary inputs shall provide a wetting current of at least 12 mA to be compatible with commonly available control devices and shall be protected against the effects of contact bounce and noise. Binary inputs shall sense "dry contact" closure without external power (other than that provided by the controller) being applied.

Pulse accumulation input objects. This type of object shall conform to all the requirements of binary input objects and also accept up to ten (10) pulses per second for pulse accumulation.

Analog inputs shall allow the monitoring of low-voltage (0 to 10 Vdc), current (4 to 20 mA), or resistance signals (thermistor, RTD). Analog inputs shall be compatible with—and field configurable to—commonly available sensing devices.

24 Vdc shall be available next to the point signal for powering the output device.

Binary outputs shall provide for On/Off operation or a pulsed low-voltage signal for pulse width modulation control. Binary outputs on building and custom application controllers shall have three-position (On/Off/Auto) override switches and status lights. Outputs shall be selectable for either normally open or normally closed operation.

Analog outputs shall provide a modulating signal for the control of end devices. Outputs shall provide either a 0 to 10 Vdc or 4 to 20 mA signal as required to provide proper control of the output device. Analog outputs on building or custom application controllers shall have status lights and manual override. Analog outputs shall not exhibit a drift of greater than 0.4% of range per year.

Tri-State Outputs: Provide tri-state outputs (two coordinated binary outputs) for control of three-point floating type electronic actuators without feedback. Use of three-point floating devices shall be limited to zone control and terminal unit control applications (VAV terminal units, duct-mounted heating coils, zone dampers, radiation, etc.). Control algorithms shall run the zone actuator to one end of its stroke once every 24 hours for verification of operator tracking.

Point name labels: It shall be possible to print customized name labels for each I/O point and install on an existing holder on the I/O device.

System Object Capacity: The system size shall be expandable to at least twice the number of input/ output objects required for this project. Additional controllers (along with associated devices and wiring) shall be all that is necessary to achieve this capacity requirement. The operator interfaces installed for this project shall not require any hardware additions or software revisions in order to expand the system.

## POWER SUPPLIES & LINE FILTERING

Control transformers shall be UL listed. Furnish Class 2 current-limiting type or furnish over-current protection in both primary and secondary circuits for Class 2 service in accordance with NEC requirements. Limit connected loads to 80% of rated capacity.

DC power supply output shall match output current and voltage requirements. Unit shall be full-wave rectifier type with output ripple of 5.0 mV maximum peak-to-peak. Regulation shall be 1.0% line and load combined, with 100-microsecond response time for 50% load changes. Unit shall have built-in over-voltage and over-current protection and shall be able to withstand a 150% current overload for at least three seconds without trip-out or failure.

Unit shall operate between 0°C and 50°C (32°F and 120°F). EM/RF shall meet FCC

Class B and VDE 0871 for Class B and MILSTD 810C for shock and vibration.

Line voltage units shall be UL recognized and CSA approved.

Power line filtering.

Provide transient voltage and surge suppression for all workstations and controllers either internally or as an external component. Surge protection shall have the following at a minimum:

Dielectric strength of 1000 volts minimum

Response time of 10 nanoseconds or less

Transverse mode noise attenuation of 65 dB or greater

Common mode noise attenuation of 150 dB or better at 40 Hz to 100 Hz.

### AUXILIARY CONTROL DEVICES

Specified in this section are the following hard wired input/output devices connected to the Building Controller or ASC:

Electric Damper Actuators

Binary Temperature Devices

Temperature Sensors

Dew Point/Humidity Sensors

Indoor Air Quality (CO2/TEMP/RH) Space Sensors

Current Switches

Local Control panels

Specified in this section are the following devices connected to the BMS using secondary network communication.

Indoor Air Quality (CO2) Space Sensors

Power Monitors

Electric Damper Actuators

### General

All actuators shall be manufactured; brand labeled, or distributed by Siemens or Belimo.

All damper actuators having more than 100 lb-in torque output shall have a self-centering damper shaft clamp. V-bolt type damper shaft clamp is not acceptable.

The actuator shall have mechanical or electronic stall protection to prevent damage to the actuator throughout the rotation of the actuator.

Where shown, for power-failure/safety applications, an internal mechanical, spring-return mechanism shall be built into the actuator housing. Alternatively, an uninterruptible power supply (UPS) may be provided. On terminal unit valves actuators and 2-second timing damper actuators capacitor driven fail action is permitted.

Modulating actuator shall accept a 0-10 Vdc control signal and provide a 0-10 Vdc

operating range.

All 24 Vac/Vdc actuators shall operate on Class 2 wiring.

All actuators over 20 lb-in torque capacity shall have an external manual gear release to allow manual positioning of the damper when the actuator is not powered and spring-return actuators shall have a manual crank for this purpose.

Upon start up and after power loss, the actuator must immediately respond to control signals. Actuators requiring calibration to determine end stops are not acceptable.

Electric actuators for emergency generator damper control shall be rated for 350°F. maximum operating temperature and capable to drive fully open and close within 15 seconds.

All actuators that provide a factory mounted electrical appliance or plenum rated cabling must be marked with numbers on the wires as well as color coded.

Provide built-in dual end switches as required for the sequence of operation.

Control damper actuators shall be RoHS Part A compliant.

Binary temperature devicesID: 319]

#### Line-voltage space thermostat

Line-voltage thermostats shall be bimetal-actuated, snap acting SPDT contact, enclosed, UL Listed for electrical rating. The thermostat cover shall provide exposed setpoint adjustment knob. The thermostat shall operate within the 55°F to 85°F setpoint range, with 2°F maximum differential.

#### Temperature sensors

Provide the following instrumentation as required by the monitoring, control and optimization functions. All temperature sensors shall use platinum RTD elements only, except for those connected to application specific controllers via RJ-11 connector.

#### Room Temperature:

Temperature monitoring range	+40/+90°F (+40/120°F for high temp alarms)
Installation adjustments	none required
Calibration adjustments	none required
Factory calibration point	32°F
Accuracy at calibration point	+/- 0.7°F

#### Duct (Single Point) Temperature

Temperature monitoring range	+20/+120°F or +30/+250°F
Installation adjustments	none required
Calibration adjustments	none required
Factory calibration point	70°F
Accuracy at calibration point	+/- 0.54°F

## Duct (Averaging) Temperature

Temperature monitoring range	+20/+120°F
Installation adjustments	none required
Calibration adjustments	none required
Factory calibration point	32°F
Accuracy at calibration point	+/- 0.54°F

## Outside Air Temperature

Temperature monitoring range	-58/+122°F
Installation adjustments	none required
Calibration adjustments	none required
Factory calibration point	70°F
Accuracy at calibration point	+0.5°F

## Dew point/humidity sensors

### Outside Air Dew Point Temperature

Dew point monitoring range	-40/+115°F DP, 12% to 99% rh
Output signal	4-20 mA
Calibration adjustments	zero and span
Factory calibration point	70°F
Accuracy at calibration point	+2.0°F DP

### Room/duct Relative Humidity

Sensor Humidity range	0 to 100%
Operating temperature	15°F to +170°F
Accuracy	+2% rh
Sensing element	Capacitive sensor
Output signal	4-20 mA DC
Installation adjustments	none required
Operating temperature	15°F to +170°F
Voltage requirement	12-36 Vdc

## Indoor air quality (CO2/TEMP/RH) sensors

Provide indoor air quality sensors to monitor Carbon Dioxide (CO2), and Temperature and Humidity.

Duct and Wall mounted sensors with Temperature shall have an option for active or passive temperature outputs (based on part number)

The sensor shall meet the following requirements:

Operating voltage:	24 Vac +/- 20%, or 15 to 35Vdc
Frequency:	50/60 Hz
Power consumption:	max. 6 VA
CO2 measuring range:	0 – 2000 ppm
Tolerance:	+/- 50 ppm

Output: 0 - 10 Vdc or 0 - 5 Vdc Field configurable  
Output (passive T, selectable) pt100, pt1000, Ni1000, NTC 10K  
Calibration: none required  
Permissible air velocity in duct: <26.2 ft/s.

#### Current switches

Current-operated switches shall be self-powered, solid-state with adjustable trip current. The switches shall be selected to match the current of the application and output requirements of the DDC system.

#### Local control panels

All indoor control cabinets shall be fully enclosed NEMA 1 construction with (hinged door) key-lock latch and removable sub panels. A single key shall be common to all field panels and sub panels.

Interconnections between internal and face mounted devices shall be prewired with color-coded stranded conductors neatly installed in plastic troughs and/or tie-wrapped. Terminals for field connections shall be UL Listed for 600 volt service, individually identified per control/ interlock drawings, with adequate clearance for field wiring. Control terminations for field connection shall be individually identified per control drawings.

Provide ON/OFF power switch with overcurrent protection for control power sources to each local panel.

#### COMMUNICATION & WIRING CONTROL

Provide copper wiring, plenum cable, and raceways as specified in the applicable sections of Division 16 unless otherwise noted herein.

All insulated wire to be copper conductors, UL labeled for 90°C minimum service.

#### Wire Sizing and Insulation

Wiring shall comply with minimum wire size and insulation based on services listed below:

<b>Service</b>	<b>Minimum Gage/Type</b>	<b>Insulation Class</b>
AC 24V Power	12 Ga Solid	600 Volt
DC 24V Power	10 Ga Solid	600 Volt
Class 1	14 Ga Stranded	600 Volt
Class 2	18 Ga Stranded	300 Volt
Class 3	18 Ga Stranded	300 Volt

Provide plenum-rated cable when open cable is permitted in supply or return air plenum where allowed per execution specifications defined in *Paragraph 3.07 – Wiring* of this specification.

#### Power Wiring

115V power circuit wiring above 100 feet distance shall use minimum 10 gage.



24V control power wiring above 200 feet distance shall use minimum 12 gage.

#### Control Wiring

Digital Input/Output wiring shall use Class 2 twisted pair, insulated.

Analog inputs shall use Class 2 twisted shielded pair, insulated and jacketed and require a grounded shield.

Actuators with tri-state control shall use 3 conductor with same characteristics

#### Communication Wiring

Ethernet Cable shall be minimum CAT5.

Secondary level network shall be 24 gage, TSP, low capacitance cable.

#### Approved Cable Manufacturers

Wiring from the following manufacturers which meet the above criteria shall be acceptable:

Anixter

Belden

### PART 3 – EXECUTION

#### EXAMINATION

The project plans shall be thoroughly examined for control device and equipment locations. Any discrepancies, conflicts, or omissions shall be reported to the architect/engineer for resolution before rough-in work is started.

The contractor shall inspect the site to verify that equipment may be installed as shown. Any discrepancies, conflicts, or omissions shall be reported to the engineer for resolution before rough-in work is started.

The contractor shall examine the drawings and specifications for other parts of the work. If head room or space conditions appear inadequate—or if any discrepancies occur between the plans and the contractor's work and the plans and the work of others—the contractor shall report these discrepancies to the engineer and shall obtain written instructions for any changes necessary to accommodate the contractor's work with the work of others.

#### PROTECTION

The contractor shall protect all work and material from damage by its employees and/or subcontractors and shall be liable for all damage thus caused.

The contractor shall be responsible for its work and equipment until finally inspected, tested, and accepted.

## COORDINATION

### Site

The project coordination between trades is the responsibility of the prime contractor who is the one tier higher contractual partner such as mechanical contractor, general contractor, construction manager, owner or owner's representative as applicable.

The controls contractor shall follow prime contractor's job schedule and coordinate all project related activities through the prime contractor except otherwise agreed or in minor job site issues. Reasonable judgment shall be applied.

Where the work will be installed in close proximity to, or will interfere with, work of other trades, the contractor shall assist in working out space conditions to make a satisfactory adjustment.

If the contractor deviates from the job schedule and installs work without coordinating with other trades, so as to cause interference with work of other trades, the contractor shall make the necessary changes to correct the condition without extra charge.

Coordinate and schedule work with all other work in the same area, or with work that is dependent upon other work, to facilitate mutual progress.

### Submittals

Refer to the *Submittals* section in *PART 1-GENERAL* of this specification for requirements.

### Test and Balance

The contractor shall furnish a single set of all tools necessary to interface to the control system for test and balance purposes.

The contractor shall provide training in the use of these tools. This training will be planned for a minimum of 4 hours.

In addition, the contractor shall provide a qualified technician for duration of 8 hours to assist in the test and balance process.

The tools used during the test and balance process shall be returned at the completion of the testing and balancing.

### Life Safety

Duct smoke detectors required for air handler shutdown are supplied under Division 16 of this specification. The contractor shall interlock smoke detectors to air handlers for shutdown.

Coordination with controls specified in other sections or divisions.

Other sections and/or divisions of this specification include controls and control devices that are to be part of or interfaced to the control system specified in this section. These controls shall be integrated into the system and coordinated by the contractor as follows:

All communication media and equipment shall be provided as specified in the *Communication* section in *PART 2 – PRODUCTS* of this specification.

Each supplier of controls product is responsible for the configuration, programming, startup, and testing of that product to meet the sequences of operation described in this section.

The Contractor shall coordinate and resolve any incompatibility issues that arise between the control products provided under this section and those provided under other sections or divisions of this specification.

The contractor is responsible for providing all controls described in the contract documents regardless of where within the contract documents these controls are described.

The contractor is responsible for the interface of control products provided by multiple suppliers regardless of where this interface is described within the contract documents.

### GENERAL WORKMANSHIP

Install equipment, piping, and wiring/raceway parallel to building lines (i.e., horizontal, vertical, and parallel to walls) wherever possible.

Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.

Install all equipment in readily accessible locations as defined by *Chapter 1, Article 100, Part A* of the *National Electrical Code (NEC)*.

Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.

All equipment, installation, and wiring shall comply with acceptable industry specifications and standards for performance, reliability, and compatibility and be executed in strict adherence to local codes and standard practices.

### FIELD QUALITY CONTROL

All work, materials, and equipment shall comply with the rules and regulations of applicable local, state, and federal codes and ordinances as identified in *PART 1 – GENERAL* of this specification.

Contractor shall continually monitor the field installation for code compliance and quality of workmanship.

Contractor shall have work inspected by local and/or state authorities having jurisdiction over the work.

### EXISTING EQUIPMENT

Unless otherwise directed, the contractor is not responsible for the repairs or

replacement of existing energy equipment and systems, valves, dampers, or actuators. Should the contractor find existing equipment that requires maintenance, the engineer is to be notified immediately.

## WIRING

All control and interlock wiring shall comply with national and local electrical codes and Division 16 of this specification. Where the requirements of this section differ from those in Division 16, the requirements of this section shall take precedence.

All NEC Class 1 (line voltage) wiring shall be UL Listed in approved conduit according to NEC and Division 16 requirements.

All low-voltage wiring shall meet NEC Class 2 requirements. (Low-voltage power circuits shall be sub fused when required to meet Class 2 current limit.)

Where NEC Class 2 (current-limited) wires are in concealed and accessible locations, including ceiling return air plenums, approved cables not in conduit may be used provided that cables are UL Listed for the intended application. For example, cables used in ceiling plenums shall be UL Listed specifically for that purpose.

All wiring in mechanical, electrical, or service rooms—or where subject to mechanical damage— shall be installed in conduit.

Do not install Class 2 wiring in conduit containing Class 1 wiring. Boxes and panels containing high voltage wiring and equipment may not be used for low-voltage wiring except for the purpose of interfacing the two (e.g., relays and transformers).

Do not install wiring in conduit containing tubing.

Where plenum rated cable is run exposed, wiring is to be run parallel along a surface or perpendicular to it and neatly tied at 3 m (10 ft) intervals.

Where plenum rated cable is used without conduit, it shall be supported from or anchored to structural members. Cables shall not be supported by or anchored to ductwork, electrical conduits, piping, or ceiling suspension systems.

All wire-to-device connections shall be made at a terminal block or wire nut. All wire-to-wire connections shall be at a terminal strip or wire nut.

All wiring within enclosures shall be neatly bundled and anchored to permit access and prevent restriction to devices and terminals.

Maximum allowable voltage for control wiring shall be 120V. If only higher voltages are available, the contractor shall provide step-down transformers or interposing relays.

All plenum rated wiring shall be installed as continuous lengths, with no splices permitted between termination points

All wiring in conduit shall be installed as continuous lengths, with no splices permitted

between termination points or junction boxes.

Maintain fire rating at all penetrations. Install plenum wiring in sleeves where it passes through walls and floors.

Size and type of conduit and size and type of wire shall be the responsibility of the contractor, in keeping with the manufacturer's recommendations and NEC requirements, except as noted elsewhere.

Include one pull string in each conduit 3/4 in. or larger.

Control and status relays are to be located in designated enclosures only. These enclosures can include packaged equipment control panel enclosures unless they also contain Class 1 starters.

Conceal all conduit, except within mechanical, electrical, or service rooms. Install conduit to maintain a minimum clearance of 15 cm (6 in.) from high-temperature equipment (e.g., steam pipes or flues).

Secure conduit with conduit clamps fastened to the structure and spaced according to code requirements. Conduit and pull boxes may not be hung on flexible duct strap or tie rods. Conduits may not be run on or attached to ductwork.

Adhere to this specification's Division 16 requirements where conduit crosses building expansion joints.

The Contractor shall terminate all control and/or interlock wiring and shall maintain updated (as-built) wiring diagrams with terminations identified at the job site.

Flexible metal conduits and liquid-tight, flexible metal conduits shall not exceed 1 m (3 ft) in length and shall be supported at each end. Flexible metal conduit less than 1/2 inch electrical trade size shall not be used. In areas exposed to moisture, including chiller and boiler rooms, liquid-tight, flexible metal conduits shall be used.

Conduit must be adequately supported, properly reamed at both ends, and left clean and free of obstructions. Conduit sections shall be joined with couplings (according to code). Terminations must be made with fittings at boxes, and ends not terminating in boxes shall have bushings installed.

### COMMUNICATION WIRING

The contractor shall adhere to the items listed in the *Wiring* section in *PART 3 – EXECUTION* of the specification.

All cabling shall be installed in a neat and workmanlike manner. Follow manufacturer's installation recommendations for all communication cabling.

Do not install communication wiring in raceway and enclosures containing Class 1 or other Class 2 wiring.

Maximum pulling, tension, and bend radius for cable installation, as specified by the cable manufacturer, shall not be exceeded during installation.

Contractor shall verify the integrity of the entire network following the cable installation. Use appropriate test measures for each particular cable.

When a cable enters or exits a building, a lightning arrestor must be installed between the lines and ground. The lightning arrestor shall be installed according to the manufacturer's instructions.

All runs of communication wiring shall be unspliced length when that length is commercially available.

All communication wiring shall be labeled to indicate origination and destination data.

Grounding of coaxial cable shall be in accordance with NEC regulations article on *Communications Circuits, Cable, and Protector Grounding*.

### INSTALLATION OF SENSORS

Install sensors in accordance with the manufacturer's recommendations.

Mount sensors rigidly and adequately for the environment within which the sensor operates.

Room temperature sensors shall be installed on concealed junction boxes properly supported by the wall framing.

All wires attached to sensors shall be air sealed in their raceways or in the wall to stop air transmitted from other areas affecting sensor readings.

Sensors used in mixing plenums and hot and cold decks shall be of the averaging type.

Low-limit sensors used in mixing plenums shall be installed in a serpentine manner horizontally across the full face of the coil.

All pipe-mounted temperature sensors shall be installed in wells. Install all liquid temperature sensors with heat-conducting fluid in thermal wells.

Install outdoor air temperature sensors on north wall, complete with sun shield at designated location.

#### Room Instrument Mounting

Room instruments, including but not limited to wall mounted thermostats and sensors located in occupied spaces shall be mounted 53 inches above the finished floor unless otherwise shown.

#### Instrumentation Installed in Piping Systems

Thermometers and temperature sensing elements installed in liquid systems shall be installed in thermowells.

Gauges in piping systems subject to pulsation shall have snubbers.

Gauges for steam service shall have pigtail fittings with isolation valve.

#### Duct Smoke Detectors

Duct smoke detectors will be provided by the Electrical Contractor in supply and return air ducts in accordance with Division 16.

Contractor shall connect the DDC System to the auxiliary contacts provided on the Smoke Detector as required for system safeties and to provide alarms to the DDC system.

#### Averaging Temperature Sensing Elements

Sensing elements shall be installed in a serpentine pattern.

Averaging sensors shall be installed in a serpentine manner vertically across the duct. Each bend shall be supported with a capillary clip.

### ACTUATORS

Mount and link control damper actuators according to manufacturer's instructions.

To compress seals when spring-return actuators are used on normally closed dampers, power actuator to approximately 5° open position, manually close the damper, and then tighten the linkage.

Check operation of damper/actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.

Provide all mounting hardware and linkages for actuator installation.

#### Electric/Electronic

Dampers: Actuators shall be direct-mounted on damper shaft or jackshaft unless shown as a linkage installation. For low-leakage dampers with seals, the actuator shall be mounted with a minimum 5° available for tightening the damper seals. Actuators shall be mounted following manufacturer's recommendations.

### PROGRAMMING

Provide sufficient internal memory for the specified sequences of operation and trend logging. There shall be a minimum of 25% of available memory free within the primary controller for future use.

#### Point Naming

System point names shall be modular in design, allowing easy operator interface without the use of a written point index. Point Naming standard shall be agreed upon between owner and BAS contractor. Refer to the *Submittals* section in *PART 1 – GENERAL* of this specification.

### Software Programming

Provide programming for the system and adhere to the sequences of operation provided. The contractor also shall provide all other system programming necessary for the operation of the system, but not specified in this document. Imbed into the control program sufficient comment statements to clearly describe each section of the program. The comment statements shall reflect the language used in the sequences of operation and be of different font and color in text editor. Use the appropriate technique based on one of the following programming types:

#### Text-based

Must provide actions for all possible situations.

Must be modular and structured.

Must be commented.

Must provide line-by-line programming and compilation wizard to allow for ease of editing.

#### Graphic-based

Must provide actions for all possible situations.

Must provide programming and compilation wizard to allow for ease of editing.

Must be documented.

### Operator Interface

Standard graphics—Provide graphics for all mechanical systems and floor plans of the building. This includes each chilled water system, hot water system, chiller, boiler, air handler, and all terminal equipment. Point information on the graphic displays shall dynamically update. Show on each graphic all input and output points for the system. Also show relevant calculated points such as setpoints.

Show terminal equipment information on a “graphic” summary table. Provide dynamic information for each point shown.

The contractor shall provide all the labor necessary to install, initialize, start up, and troubleshoot all operator interface software and its functions as described in this section. This includes any operating system software, the operator interface database, and any third-party software installation and integration required for successful operation of the operator interface.

Contractor shall provide necessary programming to create all reports referred to in the *Operator Interface Software* section in *PART 2–PRODUCTS* of this specification.

## CONTROL SYSTEM DEMONSTRATION & ACCEPTANCE

### Demonstration

Prior to acceptance, the control system shall undergo a series of performance tests to verify operation and compliance with this specification. These tests shall occur after the Contractor has completed the installation, started up the system, and performed his/her own tests.

The tests described in this section are to be performed in addition to the tests that the contractor performs as a necessary of the installation, start-up, and debugging process



and as specified in the *Control System Checkout and Testing* section in *PART 3–EXECUTION* of this specification. The engineer will be present to observe and review these tests. The engineer shall be notified at least 10 days in advance of the start of the testing procedures.

The demonstration process shall follow that approved in the *Submittals* section in *PART 1–GENERAL* of this specification. The approved checklists and forms shall be completed for all systems as part of the demonstration.

The contractor shall provide at least two persons equipped with two-way communication and shall demonstrate actual field operation of each control and sensing point for all modes of operation including day, night, occupied, unoccupied, fire/smoke alarm, seasonal changeover, and power failure modes. The purpose is to demonstrate the calibration, response, and action of every point and system. Any test equipment required to prove the proper operation shall be provided by and operated by the contractor.

As each control input and output is checked, a log shall be completed showing the date, technician's initials, and any corrective action taken or needed.

Demonstrate compliance with the *System Performance* section in *PART 1–GENERAL* of this specification.

Demonstrate compliance with sequences of operation through all modes of operation.

Demonstrate complete operation of operator interface.

Any tests that fail to demonstrate the operation of the system shall be repeated at a later date. The contractor shall be responsible for any necessary repairs or revisions to the hardware or software to successfully complete all tests.

### Acceptance

All tests described in this specification shall have been performed to the satisfaction of both the engineer and owner prior to the acceptance of the control system as meeting the requirements of completion. Any tests that cannot be performed due to circumstances beyond the control of the contractor may be exempt from the completion requirements if stated as such in writing by the engineer. Such tests shall then be performed as part of the warranty.

The system shall not be accepted until all forms and checklists completed as part of the demonstration are submitted and approved as required in the *Submittals* section in *PART 1–GENERAL* of this specification.

### CLEANING

The contractor shall clean up all debris resulting from their activities daily. Contractor shall remove all cartons, containers, crates, etc., under their control as soon as their contents have been removed. Waste shall be collected and placed in a designated location.

At the completion of work in any area, the contractor shall clean all work, equipment, etc., keeping it free from dust, dirt, and debris, etc.

At the completion of work, all equipment furnished under this section shall be checked for paint damage, and any factory-finished paint that has been damaged shall be repaired to match the adjacent areas. Any cabinet or enclosure that has been deformed shall be replaced with new material and repainted to match the adjacent areas.

### TRAINING

The Contractor shall provide competent instructors to give full instruction to designated personnel in the adjustment, operation and maintenance of the system installed. Factory employed/certified instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. All training shall be held during normal work hours of 8:00 a.m. to 4:30 p.m. weekdays.

### SEQUENCE OF OPERATION

Refer to Sequence on plans.

END OF SECTION 15950

## SECTION 15995 - COMMISSIONING OF HVAC SYSTEMS

### PART 1 – GENERAL

#### GENERAL

General provisions and mechanical are specified in division 15.

This division covers the commissioning of the mechanical and their controls systems.

The commissioning authority shall be the Baldwin County School Board facilities department.

Qualifications and experience for the HVAC commissioning team.

At a minimum, the proponent company's qualifications and experience shall include the following:

Membership in AABC Commissioning Group (ACG) and commissioning certification from that organization.

At least 10 years of experience with the types of building HVAC and control systems included in this project.

Knowledge of operations and maintenance requirements.

A thorough knowledge of testing, adjusting and balancing (TAB) procedures and methods.

Knowledge and experience with applicable life safety codes, regulations, and procedures.

Successful experience working with multi-disciplinary teams.

Excellent oral and written communication skills.

#### SUBMITTALS

Approval is required for submittals. The following shall be submitted in accordance with submittal procedures:

Product Data:

Commissioning Team:

List of team members who will represent the contractor to the pre-commissioning checks and functional performance testing, at least 2 weeks prior to the start of pre-commissioning checks. Proposed revision to the list, prior to the start of the impacted work. Two commissioning teams shall be required.

Test Schedule: Schedule for pre-commissioning checks and functional performance tests, at least 2 weeks prior to the start of pre-commissioning checks.

Test Reports: Completed pre-commissioning checklists and functional performance test

checklists organized by system and by subsystem and submitted as one package. The results of failed tests shall be included along with a description of the corrective action taken.

## SEQUENCE AND SCHEDULING

The work described in this section shall be only after all work required in related Sections, including Section 15200: Testing and Balancing Air and Water Distribution Systems and Section 15900 for Automatic Temperature Control Systems and 15950 for EMCS & DDC has been successfully completed, and all test and inspection reports and operation and maintenance manuals required in these Sections have been submitted and approved.

All team members shall be required to be on the project site for the commissioning procedures.

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### COMMISSIONING TEAM AND CHECKLISTS

The Contractor shall designate team members to participate in the pre-commissioning checks and the functional performance testing specified herein. In addition, the Owner shall be represented by a representative of the Construction Office and the Architect Design Team Representative. The team members shall be as follows:

Designation Function:

**M Contractor's Mechanical Representative**  
**E Contractor's Electrical Representative**  
**T Contractor's Testing, Adjusting, and Balancing Representative**  
**C Contractor's Controls Representative**  
**D Design Agent's Representative**  
**O Owner's Representative**

Each checklist shown in appendices A and B shall be completed by the commissioning team. Acceptance by each commissioning team member of each pre-commissioning checklist item shall be indicated by initials and date unless an "X" is shown indicating that participation by that individual is not required. Acceptance by each commissioning team member of each functional performance test checklist shall be indicated by signature and date.

## TESTS

The pre-commissioning checks and functional performance tests shall be performed in a manner which essentially duplicates the checking, testing, and inspection methods established in the related Sections. Where checking, testing, and inspection methods are not specified in other Sections, methods shall be established which will provide the

information required. Testing and verification required by this section shall be performed during the Commissioning phase. Requirements in related Sections are dependent from the requirements of this Section and shall not be used to satisfy any of the requirements specified in this Section. The Contractor shall provide all materials, services, and labor required to perform the pre-commissioning checks and functional performance tests. A pre-commissioning check or functional performance test shall be aborted if any system deficiency prevents the successful completion of the test or if any participating commissioning team member of which participation is specified is not present for the test. The Contractor shall reimburse the Owner for all costs associated with effort lost due to tests that are aborted.

#### Pre-commissioning Checks

Pre-commissioning checks shall be performed for the items indicated on the checklists in Appendix A. Deficiencies discovered during these checks shall be corrected and retested in accordance with the applicable contractor requirements.

#### Functional Performance Tests

Functional performance tests shall be performed for the items indicated on the checklists in Appendix B. Functional tests shall begin only after all pre-commissioning checks have been successfully completed. Tests shall prove all modes of the sequences of operation, and shall verify all other relevant contract requirements. Tests shall begin with equipment or components and shall progress through subsystems to complete systems. Upon failure of any functional performance test checklist item, the Contractor shall correct all deficiencies in accordance with the applicable contract requirements. The checklist shall then be repeated until it has been completed with no errors.

## APPENDIX A

### PRE-COMMISSIONING CHECKLISTS

#### Pre-Commissioning checklist – Piping

##### Condensate Drain Piping – All units

Checklist Item	M	E	T	C	D	O
Installation						
a. Piping complete.	___	X	___	X	___	___
b. Cleanout caps installed as required.	___	X	___	X	___	___
c. Piping insulated as required.	___	X	___	X	___	___
d. Piping secured and installed as specified.	___	X	X	X	___	___
Testing, Adjusting, and Balancing (TAB)						
a. Hydrostatic test complete.	___	X	___	___	X	___

## Pre-Commissioning Checklist – Ductwork

For Air Handling Unit: AHU#

Checklist Item	M	E	T	C	D	O
Installation						
a. Ductwork complete.	___	X	___	X	___	___
b. As-built shop drawings submitted.	___	X	___	X	___	___
c. Ductwork leak test complete.	___	X	___	X	___	___
d. Fire dampers, and access doors installed as required.	<u>N/A</u>	X	<u>N/A</u>	X	<u>N/A</u>	<u>N/A</u>
e. Ductwork insulated as required.	___	X	___	X	___	___
f. Thermometers and gauges installed as required.	___	___	___	___	___	___
g. Verify open/closed status of dampers.	___	X	___	X	___	___
h. Flexible connectors installed as specified.	___	X	___	X	___	___
Testing, Adjusting, and Balancing (TAB)						
a. TAB operation complete.	___	X	___	X	___	___

## Pre-Commissioning Checklist – DX Split System Air Handling Unit

For Air Handling Unit: AHU/HPU#

Checklist Item	M	E	T	C	D	O
<b>Installation</b>						
a. Vibration isolation devices installed.	___	X	X	X	___	___
b. Inspection and access doors are operable and sealed.	___	X	___	X	___	___
c. Casing undamaged.	___	X	X	X	___	___
d. Insulation damaged.	___	X	X	X	___	___
e. Condensate drainage is unobstructed. (Visually verify drainage by pouring a cup of water into drain pan.)	___	X	X	X	___	___
f. Fan belt adjusted (if applicable).	___	X	___	X	___	___
g. Manufacturer's required maintenance clearance provided.	___	X	X	X	___	___
<b>Electrical</b>						
a. Power available to unit disconnect.	___	___	X	X	___	___
b. Power available to electric heater.	___	___	X	___	___	___
c. Proper motor rotation verified.	___	___	___	X	___	___
d. Verify that power disconnect is located within sight of the unit it controls.	___	___	X	___	___	___
<b>Coils</b>						
a. Refrigerant piping properly connected.	___	X	X	X	___	___
<b>Checklist Item</b>						
a. Any damage to coil fins has been repaired.	___	X	___	X	___	___
<b>Controls</b>						
a. Air handler controls system operational.	___	X	___	___	___	___



## Testing, Adjusting, and Balancing (TAB)

a.	Construction filters removed and replaced.	___	X	___	___	___	___
b.	TAB report submitted.	___	X	___	X	___	___
c.	TAB results within +10%/-0% of cfm shown on drawings.	___	X	___	X	___	___
d.	TAB results for outside air intake within +10%/-0% of both the minimum and Maximum cfm shown on drawings.	___	X	___	X	___	___

## Pre-Commissioning Checklist – Fans

For Exhaust and Supply Fans: EF#

Checklist Item	M	E	T	C	D	O
Installation						
a. Fan belt adjusted.	<u>N/A</u>	X	<u>N/A</u>	X	<u>N/A</u>	<u>N/A</u>
b. Speed controller installed.	___	X	___	X	___	___
Electrical						
a. Power available to fan disconnect.	___	___	X	___	___	___
b. Proper motor rotation verified.	___	___	___	X	___	___
c. Verify that power disconnect is located Within sight of the unit it controls.	___	___	X	___	___	___
Controls						
a. Control interlocks properly installed.	___	___	X	___	___	___
b. Control interlocks operable.	___	___	X	___	___	___
c. Dampers/actuators properly installed.	___	X	___	___	___	___
d. Dampers/actuators operable.	___	X	___	___	___	___
e. Verify proper locations and installation of thermostat.	<u>N/A</u>	X	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Testing, Adjusting, and Balancing (TAB)						
a. TAB results –10%/-0% to cfm shown on drawings.	___	X	___	X	___	___
b. TAB Report submitted.	___	X	___	X	___	___

## Pre-Commissioning Checklist – HVAC System Controls

For HVAC System: All

Checklist Item	M	E	T	C	D	O
Installation						
a. As-built shop drawings submitted.	___	X	X	___	___	___
b. Layout of control panel matches drawings.	___	X	X	___	___	___
c. Framed instructions mounted in or near control panel.	___	X	X	___	___	___
d. Components properly labeled (on inside and outside of panel).	___	X	X	___	___	___
e. Control components piped and/or wired to each labeled terminal strip.	___	X	X	___	___	___
f. EMCS connection made to each labeled terminal strip as shown.	___	X	X	___	___	___
g. Control wiring and tubing labeled at all terminations, splices, and junctions.	___	X	X	___	___	___
h. Shielded wiring used on electronic sensors.	___	X	X	___	___	___
Main Power and Control Air						
a. 110 volt AC power available to panel.	___	___	X	___	___	___
Testing, Commissioning, and Balancing						
a. Testing, Commissioning, and Balancing Report submitted.	___	X	___	___	___	___

## Pre-Commissioning Checklist – Electric Unit Heater

For Electric Unit Heater: EUH#

Checklist Item	M	E	T	C	D	O
Installation						
a. Unit properly installed and secured in wall.	___	X	X	X	___	___
b. Grille undamaged.	___	X	X	X	___	___
c. Heating element fins undamaged.	___	X	X	X	___	___
Electrical						
d. Power available to fan disconnect.	___	___	X	___	___	___
e. Proper motor rotation verified.	___	___	___	X	___	___
f. Verify that power disconnect is located Within sight of the unit it controls.	___	___	X	___	___	___
Controls						
f. Thermostat controls heater operation.	___	___	X	___	___	___
g. Fan delay is functional.	___	___	X	___	___	___

## APPENDIX B

### FUNCTIONAL PERFORMANCE TESTS CHECKLISTS

#### Functional Performance Test Checklist – Split System DX Heat Pump Unit

For Heat Pump Unit: AH/HP#

1. Functional Performance Test: Contractor shall verify operation of air handling unit as per specification including the following:

##### Occupied Mode:

- Verify that supply fan energizes with building occupancy schedule:
- Verify that compressor section cycles on/off with thermostat temperature setpoint:
- As compressor is “off”, override relative humidity sensor to initiate dehumidification sequence. Verify that compressor energizes and hot gas reheat is functional (verify air handler LAT):

Cooling mode EAT/LAT =  
Dehumidification mode EAT/LAT =  
Heat Pump Heating mode EAT/LAT =

- Verify electric resistance heater is operable for heating operation. Override space temperature to energize electric heater sequence.

Electric heater mode EAT/LAT =

- Verify that all dampers area in normal position:  
Motorized OA damper opens to preset position:
- Verify system safeties allow start if safety conditions are met:
- Verify unit shuts down on building fire alarm (area smoke detector and/or pull station):
- Verify unit shuts down on duct smoke detector alarm:

##### Unoccupied mode:

- Verify that supply fan de-energizes with building occupancy schedule:
- Verify that compressor section cycles on /off with thermostat setback temperatures:
- As compressor is “off”, override relative humidity sensor to initiate “unoccupied”

dehumidification sequence. Verify that compressor energizes and hot gas reheat is functional (verify air handler LAT) (OA damper should remain closed):

Cooling mode EAT/LAT =  
Dehumidification mode EAT/LAT =  
Heat Pump Heating mode EAT/LAT =

- Verify that all dampers are in normal position:  
Motorized OA damper closes:

2. Certification: We the undersigned have witnessed the above functional performance tests and certify that the item tested has met the performance requirement in this section of the specifications.

Signature and Date

Contractor's Mechanical Representative

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Contractor's Electrical Representative

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Contractor's Testing, Adjusting, and  
Balancing Representative

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Contractor's Controls Representative

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Owner's Representative

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## Functional Performance Test Checklist – Fans

For Exhaust Fan: EF#

1. Functional Performance Test: Contractor shall verify operation of fan as per specification including the following:

### Occupied Mode:

- Verify exhaust fan energizes with building occupancy schedule:
- Verify fan operates without excessive noise and/or vibration:
- Verify system safeties allow start if safety conditions are met:

### Unoccupied Mode:

- Verify exhaust fan de-energizes with building occupancy schedule.

2. Certification: We the undersigned have witnessed the above functional performance test and certify that the item tested has met the performance requirements in this section of the specification.

Signature and Date

Contractor's Mechanical Representative

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Contractor's Electrical Representative

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Contractor's Testing, Adjusting, and  
Balancing Representative

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Contractor's Controls Representative

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Owner's Representative

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## Functional Performance Test Checklist – Fans

For Exhaust Fan: EF#

1. Functional Performance Test: Contractor shall verify operation of fan as per specification including the following:

Occupied Mode:

- Verify exhaust fan energizes with building occupancy schedule:
- Verify fan operates without excessive noise and/or vibration:
- Verify system safeties allow start if safety conditions are met:

Unoccupied Mode:

- Verify exhaust fan de-energizes with building occupancy schedule.

2. Certification: We the undersigned have witnessed the above functional performance test and certify that the item tested has met the performance requirements in this section of the specification.

Signature and Date

Contractor's Mechanical Representative

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Contractor's Electrical Representative

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Contractor's Testing, Adjusting, and  
Balancing Representative

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Contractor's Controls Representative

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Owner's Representative

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## Functional Performance Test Checklist – Electric Unit Heater

For Wall Heater: EUH#1

1. Functional Performance Test: Contractor shall verify operation of heater as per specification including the following:

- Verify that supply fan energizes prior to heating element:
- Verify that supply fan remains operational when heater de-energizes for fan delay:
- Verify that built-in thermostat activates/de-activates heating mode:
- Verify leaving air temperature during heating mode:

Electric heater LAT =

2. Certification: We the undersigned have witnessed the above functional performance tests and certify that the item tested has met the performance requirement in this section of the specifications.

Signature and Date

Contractor's Mechanical Representative

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Contractor's Electrical Representative

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Contractor's Testing, Adjusting, and  
Balancing Representative

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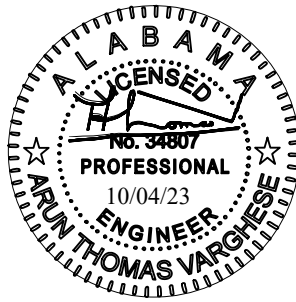
Contractor's Controls Representative

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Owner's Representative

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# ELECTRICAL SPECIFICATIONS 16000



## SECTION 16100 - ELECTRICAL

### PART 1 - GENERAL

#### RELATED DOCUMENTS

The General and/or Special Conditions Sections are a part of this specification and the Contractor shall consult them in detail for instructions pertaining to this work. Section 16 is sub-divided for convenience only.

#### SCOPE

Furnishing of all labor, material, equipment, supplies, and services necessary to construct and install the complete electrical systems as shown on the drawings and specified herein. Work shall include but is not necessarily limited to the following items:

- Service Entrance
- Grounding
- Lighting and controls
- Demolition
- Telecommunications
- Exterior Distribution/Branch Circuits
- Interior Distribution/Branch Circuits
- Equipment Connections
- Fire alarm
- Intercom/Sound
- Outdoor Lighting

#### JOB CONDITIONS

Site Inspections: Before submitting proposals, each bidder should visit the site and fully familiarize himself with all job conditions and shall be fully informed as to the extent of his work. No consideration will be given after bid opening date for alleged misunderstanding as to the requirements of work involved in connecting to the utilities, as to requirements of materials to be furnished, or as to the extent of demolition required.

Existing Conditions: All utilities, existing systems, and conditions shown on the plans as existing are approximate, and the Contractor shall verify all details of the project before any work is started.

Scheduled Interruptions: Planned interruptions of utilities service, to any facility affected by this contract, shall be carefully coordinated and approved by the Architect at least ten (10) days in advance of the requested interruption. The Contractor shall not interrupt services until specific approval has been granted by the Architect. The request shall indicate services to be affected, date and time of interruption and duration of outage. Request for interruption of service will not be approved until all equipment and material required for the completion of that particular phase of work are on the job site. The work may have to be scheduled after normal working hours.

Maintaining Service: Any existing service (or operating system) which must be interrupted for any length of time shall be supplied with a temporary service as necessary for continuation of the normal operation of this facility.

Removal of Existing Work: Where noted or indicated on the drawings, or specified herein, existing electrical materials and equipment shall be removed from the building. All materials designated to be removed by the Contractor, not to be salvaged and given to the Owner or required to be reinstalled, including scrap, shall become the property of the Contractor, and shall be promptly removed from the site. Existing items required to be removed temporarily in order to properly install new work shall be replaced in a satisfactory manner upon completion.

### TEMPORARY POWER

Furnish and maintain temporary wiring system for light and power for use during construction by all trades. Use solidly grounded system. Limit over-current protection to 20 amperes on No. 12 conductors. Coordinate all requirements for temporary power with the serving utility and pay for all charges incurred while furnishing power for construction. Verify whether charges for electrical power consumption are specified in Division One; if so, payment of bills for power consumption are not included under this section.

Accidental Interruptions: All excavation and/or remodeling work required shall be performed with care so as not to interrupt other existing services (water, gas, electrical, sewer, sprinklers, etc.). If accidental utility interruption resulting from work performed by the Contractor occurs, service shall be immediately restored to its original condition without delay, by and at the expense of the Contractor, using skilled workmen of the trade required.

### CODES, PERMITS AND INSPECTIONS

The installation shall comply with all local, state, and federal laws and ordinances applicable to electrical installation and with the regulations of the latest published edition of the National Electrical Code (N.E.C.) where such regulations do not conflict with those laws and ordinances. The Contractor shall obtain and pay for all permits and inspection fees, and after completion of the work, shall furnish the Architect a certificate of final inspection and approval from the applicable local inspection authorities. Any charges by a utility (Power, Telephone, Cable TV, etc.) for providing service as shown shall be included in the bid and paid by the Contractor. The installation shall comply with:

International building Code 2015

International Fire Code 2015

NFPA 70-2014, National Electrical Code

NFPA 72-2013, National Fire Alarm and Signaling Code

ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings

## DRAWINGS AND SPECIFICATIONS

The drawings and these specifications are complimentary each to the other. What is called for by one shall be as binding as if called for by both. Where the drawings and/or specifications differ as to quantity or quality, the greater quantity or higher quality shall be provided. Omissions from the drawings and specifications of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such work. In any case of discrepancy in the figures or catalog numbers, the matter shall be submitted to the Architect, who shall promptly make a determination in writing. Any adjustment by the Contractor shall be at the Contractor's own risk and expense. Electrical drawings are diagrammatic only. Do not scale these drawings. All equipment shall be installed in accordance with manufacturer's recommendations and any conflicting data shall be verified before bidding.

## STANDARDS OF MATERIALS AND WORKMANSHIP

Materials: All materials shall be new and shall be listed and approved by the Underwriters' Laboratories, Inc., in every case where a standard has been established for a particular type of material in question. All work shall be executed in a workmanlike manner and shall present a neat appearance.

Prior Approvals: Equipment and materials of the same type or classification and used for the same purpose, shall be products of the same manufacturer. It is the intention of these specifications to indicate a standard of performance and quality for all materials incorporated in this work. Manufacturer's names and catalog numbers are used to designate the item of equipment or material as a means of establishing grade and quality. Where several manufacturers are named, only those named manufacturers' products will be considered and the Contractor's bid shall be on their products. The first named of several manufacturers is the manufacturer whose product was used in engineering the project. Other named manufacturers, although acceptable as manufacturers, shall guarantee that their product will perform as specified and will meet space requirements. Where performance characteristics of such equipment differs from the equipment scheduled on the drawings, the engineer shall reserve the right to reject it. Where use of such equipment requires different quantity or arrangement of foundations, supports, ductwork, piping, wiring, conduit and any other equipment. The Contractor shall furnish said changes and additions and pay all costs for all changes to the work and the work of others affected by using such equipment.

For approval of products other than those specified, bidders shall submit to the Architect, a request in writing, at least ten (10) days prior to bid date. Requests received after this time will not be reviewed or considered regardless of cause. Requests shall clearly define and describe the product for which approval is requested. Requests shall be accompanied by manufacturer's literature, specifications, drawings, cuts, performance data, model numbers, list of references or other information necessary to completely describe the item. Approval will be in the form of an Addendum to the specifications issued to all prospective Prime Contract Bidders on record. The Addendum will indicate the additional products which are approved for this project.

If a bidder proposes to use substitute materials or equipment for the following items, he shall obtain a minimum of ten (10) days before Bid "Prior Approval" or longer as described in "Instructions to Bidders" for the items indicated below:

Lighting controls.  
Dry type transformers.  
Panelboards.  
Safety switches.  
Lighting fixtures.  
Emergency battery units.  
Fire alarm system.  
Intercom/Clock

Approval on other items shall be handled in the normal manner, as described in "Instructions to Bidders", under the heading "Approval of Materials", preferably before receipt of bids.

Substitutions: Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of material and equipment required for this installation and is not intended to exclude products equal in quality and similar design. The Architect reserves the sole right to decide the equality of materials proposed for use in lieu of these specified. It shall be the Contractor's responsibility to furnish the information and data sufficient to establish the quality and utility of the items in question, including furnishing samples if required.

Shop Drawings: The Contractor shall submit a list of items proposed for use. He shall also submit catalog data and shop drawings on proposed systems and their components, panelboards, safety switches, starters and contactors, transformers, lighting fixtures, and wiring devices. Where substitutions alter the design or space requirements, the Contractor shall defray all items of cost for the revised design and construction including costs to all allied trades involved. Data shall be submitted within ten (10) calendar days after the contract is awarded. Provide six (6) copies of shop drawings unless a greater number of copies is required by the General Conditions. Each submittal data section shall be covered with an index sheet listing Contractor, Sub-Contractor, Project Name, and an index to the enclosed submittals.

Each major section of submittals such as power, equipment, lighting equipment, fire alarm, etc., shall be secured in a booklet or stapled with a covering index which lists the following information:

General contractor with phone number and project manager.  
Subcontractor with phone number and project manager.  
Supplier of equipment with phone number and person responsible for this project.

Index of each item covered in submittal and model number as proposed in the attached.

Any deviation from contract documents shall be specifically noted on submittal cover index and boldly on specific submittal sheet.

## TYPE OF PERMANENT ELECTRICAL SERVICE

Existing electrical service is 480 volts, 3-phase, 4-wire. Contractor shall verify all details of electrical service with the serving utility company prior to bid. Contractor shall include any and all costs associated with the service in his bid price and shall pay these costs to the serving utility company.

Operating and Maintenance Manuals: At completion of the work, furnish three (3) copies of written operation instructions which shall include manufacturer's descriptive bulletins, operating and maintenance manuals and parts lists of all equipment installed. Also include in such instructions, the specified size and capacity ratings of all equipment installed. Each set of instructions shall be assembled into a suitable loose-leaf type binder and presented to the Architect for delivery to the Owner.

Record Drawings: Maintain one extra set of black-line, white print drawings for use as Record drawings. Records shall be kept daily, using colored pencil. As the work is completed, relevant information shall be transferred to a reproducible set, and copies made to be given to the Architect.

Comply with the following for all work specified in Division Sixteen. As-built information shall be shown to scale, using standard symbols listed in the legend. As a minimum, show the following:

Location of stub-outs, dimensioned from permanent building lines.

Location and depth of under-slab and in-slab raceways.

All routing of raceways.

Corrected panelboard and equipment schedules.

Corrected circuit numbers as they appear on panelboard directories.

Corrected motor horsepower and full load amperages.

Number, size, type of insulation, and number of wires in each conduit or multi-conductor cable whether in conduit or exposed.

Location of junction boxes and splices.

Location of access panels.

## INTERFACE WITH OTHER CONTRACTS

It shall be the responsibility of the Contractor to cooperate with all other crafts working on this project. All cutting, trenching, backfill, and structural removals to permit entry of the electrical system components shall be done by this Contractor. All patching and finishing shall be done by the General Contractor.

It shall be the responsibility of the Electrical Contractor to coordinate, provide, and install the overcurrent protection devices, wire, and conduit as required for the specific mechanical equipment installed.

It shall be the responsibility of the Contractor to cooperate with all other crafts working on this project to ensure there are not pipes, ductwork or other foreign systems as described in the latest version of the NEC within the working space or the dedicated space for the electrical equipment. All piping, ductwork or other foreign systems as described in the latest version of the NEC located above the dedicated space shall have

shields or other protection as approved by the NEC.

### EQUIPMENT FURNISHED UNDER OTHER SECTIONS

This Contractor shall furnish and install complete electrical roughing-in and connection to all equipment furnished under other sections as indicated on drawings. All such equipment shall be set in place as work of other sections.

The Electrical Contractor is to provide and install all components, wire, conduit, boxes, etc. to interlock the exhaust fans with the HVAC equipment as required.

The Electrical Contractor is to provide and install the required device boxes for the HVAC controls. A raceway, 3/4" conduit minimum, is to be provided and installed from the device location to the accessible space above the ceiling or as appropriate for the application. Line voltage thermostats are to be installed by the Electrical Contractor. Exact requirements for control wiring, conduit, boxes, etc. shall be coordinated with the mechanical contractor and mechanical documents prior to bid.

### EQUIPMENT CONNECTIONS

In general, provide electrical power and control systems connections to all equipment shown on drawings. Included are wiring raceways, disconnects, starters, and other devices shown. Excluded are devices furnished integrally with the manufacturer's package and work specified in other sections of these specifications.

### GROUNDING

Provide grounding and bonding systems in strict accordance with the latest published edition of N.E.C., except where more stringent requirements are specified herein. Interconnection of neutral and ground is not permitted except at service entrance equipment or as required for a separately derived system. Install grounding conductors to permit shortest and most direct path to ground. Inaccessible joints are not to be made in grounding conductors. Where grounding conductors are in raceway, bond conductor and raceway at both ends. Grounding and bonding fittings used shall be UL listed and be compatible with metals used in system. Sheet metal type straps are not acceptable.

Service entrance ground shall consist of driven electrodes, ground ring, building steel, water pipe electrodes, concrete encased electrode, rod and pipe electrodes, or plate electrodes as available. The driven electrodes, building steel, water pipe electrodes, and concrete encased electrodes are the minimum requirements. Unless otherwise shown on drawings, each driven electrode shall consist of one 3/4 inch diameter 10 ft. long copperweld steel rod. Rod made of wrought iron may be used in lieu of copperweld at option of contractor. Water pipe connection shall be made to a minimum one inch diameter metallic cold water pipe. Extend grounding conductor to main telephone equipment space. Interconnect conduits entering and leaving service entrance equipment using grounding bushing and copper conductor.

A green insulated ground conductor shall be run in all branch circuit and feeder conduit with phase and/or neutral conductors. Ground conductor shall be sized per NEC or as noted on drawings. Minimum size #12 AWG. Conduit box to device strap or yoke



screw connection is not sufficient. Provide an insulated grounding jumper for receptacle circuits.

The Electrical Contractor shall test and provide written certification of final ground system; including test method, equipment model and serial numbers, and final measurements at each point. The ground electrode system must be less than 25 ohms.

## GUARANTEE AND SERVICE

Upon completion of all tests and acceptance, the Contractor shall furnish the Owner of a written guarantee covering the electrical work done for a period of one (1) year from date of acceptance. Guarantee includes equipment capacity and performance ratings specified without excessive noise levels. Upon notice from the Architect or the Owner, the Contractor shall, during the guarantee period, rectify and replace any defective material or workmanship and repair any damage caused thereby without additional cost.

## PART 2 - PRODUCTS

### GENERAL

All equipment and materials shall have ratings established by the recognized independent agency or laboratory. The Contractor shall apply the items used on the project within the ratings and subject to any stipulations or exceptions established by the independent agency or laboratory. Use of equipment or materials in applications beyond that certified by the agency or beyond that recommended by the manufacturer shall be cause for removal and replacement of such misapplied items.

### PANELBOARDS

General: Furnish and install circuit breaker lighting and appliance panelboards where shown on the drawings and as indicated in the panelboards schedule. Panelboards shall comply with the following industry standard:

NEMA Standard PB-1

UL Standards: Cabinets and Boxes -UL50; Panelboards - UL 67

National Electric Code

Panelboards shall be labeled as suitable for use as service equipment in accordance with Article 408 of the National Electrical Code.

Box: The panel box shall not be less than 20 inches wide and fabricated from galvanized or galvanized steel. Box shall have adjustment screws to provide easy alignment for flush mounted applications. Removable end walls to be blank with no KO's. Panelboard box is to have separate UL label and minimum wire bending and gutter requirements to meet the NEC and UL standards. Wiring gutters shall be completely free of any part of trim clamp to prevent damaging wire insulation.

Interior Type S3: All interiors shall be completely factory assembled. The design of the interior should permit replacement of circuit breakers without disturbing adjacent units and without machine drilling or tapping. Bus bars and breaker branch bus shall be of

98% conductivity copper. Bus sequence shall start at the top left phase bus of the interior for both top and bottom fed panels. Panelboard bus structure and main breaker or main lugs shall have current ratings as shown on the plans or as indicated in panel schedule. Such ratings shall be established by heat rise test in accordance with Standard UL 67. Bus bars shall be supported by glass filled polyester type insulators. All bolts used to connect current carrying parts together shall be case hardened, thread-forming type and be accessible for tightening from the front of the panel. Provide an individual circuit number button with an embossed number next to each breaker or provision. Stick on numbers are unacceptable.

Dead front to be provided with flange for easy attachment of trim. Incoming cable lugs shall be grouped at one end to separate them from the load side cables. Neutral bussing shall have a lug for each outgoing branch requiring a neutral connection. For easy wiring and shortest cable run possible, load side neutral connection lugs to be split with each side taking 50% of load neutral connections. The interior shall be provided with wing nuts for securing to box without tools.

All computer isolation panels shall have 200% neutral bus.

Fas-Latch Trim: The panel trim shall be surface or flush as indicated on the drawings. It shall be fabricated from cold rolled steel, painted with an ANSI-61 light gray finish and equipped with concealed hinges, flush lock and a holder for circuit directory card. Trim shall have two separate supports designed to engage the box flange to stabilize and secure the trim during installation. Trim screws to be located behind the lockable door for tamper resistance. No external screws on trims will be allowed. Trims shall be hinged to box.

Description: The panelboards shall be Sentron type for use on systems as indicated on each panelboard schedule. The panelboard enclosures shall be NEMA Type 1 construction for top or bottom cable entrance and suitable for surface or flush mounting unless otherwise noted on panelboard schedules. Panels shall be interchanged from top or bottom feeds.

Short circuit rating shall be as indicated on panel schedule.

Provide main lug only or main circuit breaker panel boards as shown on panelboard schedules. Also provide branch and subfeed circuit breakers of the quantity, trip rating and number of poles as shown on schedules. All panels shall accept additional feed thru lugs or subfeed breaker without modification to bus.

Molded case circuit breakers shall be thermal magnetic, quick make, quick break, trip free. Multi-pole breakers shall be common trip. All breakers shall be equipped with antiturn solderless, pressure type connectors. All provisions shall be located at the bottom of the panelboard and be fully bussed complete with all necessary mounting hardware less the breaker. No plug in breakers will be allowed.

All panels shall be fully rated. No series rating of breakers is acceptable.

Provide subfeed lugs, feed through lugs, handle blocking devices, pad locking devices, shunt trips and ground bus bars as shown on schedules.

Panelboards shall be manufactured by Siemens, General Electric or Square D or prior approved.

### NAMEPLATES

Each new panel shall have an external micarta engraved nameplate. Disconnect switches, starters or similar devices shall have a micarta engraved nameplate mechanically affixed (no glue) indicating the load served and the location, such as "A/C 2" or "A/C 3 above ceiling". Letters shall be 1/4" black on a white background. Panels shall be designated in this manner.

"Panel A  
120/208 Volts  
3 Phase, 4 Wire"

### DIRECTORIES

For panelboards, install typewritten directories, listing each branch circuit, identifying space and equipment it controls. Label panels, disconnect switches, pushbuttons, motor starters, and time clocks with identification shown on plans using engraved nameplates, identify main and switches ahead of mains, noting equipment they serve.

### DISCONNECT SWITCHES

Furnish heavy duty disconnect switches. Switches shall be a product of the same manufacturer as panelboards, using a quick-make, quick-break mechanism. Enclosure shall be Nema Type conforming to area in which it is installed. Shop drawings include manufacturer's catalog data and physical dimensions for each size switch.

### FUSES

Furnish fuses for fusible equipment. Supply one (1) set of 3-spare fuses for each size used. Provide spare fuse cabinet. Fuses specified are coordinated and shall be manufactured by Bussman. Chase-Shawmut and Little Fuse will be approved provided shop drawing submittal demonstrates selective coordination.

### RACEWAY AND FITTINGS

Rigid Metal Conduit - Shall have threaded fittings, galvanized steel or threadless compression galvanized steel or threadless compression cadmium plated malleable iron. Fittings shall be rain tight/concrete tight.

Electrical Metallic Tubing (EMT) - Material of steel or malleable iron is acceptable. Couplings and connectors shall be concrete and rain tight, with connectors having insulated throats. Use gland and ring compression type couplings and connectors for conduit sizes 2" and smaller. Use set screw type couplings with four set screws each for conduit sizes over 2". Use set screws of casehardened steel with hex head and cup point to firmly seat in wall of conduit for positive grounding. Indent type connectors or couplings are prohibited. Die-cast or pressure-cast zinc-alloy fittings or fittings made of "pot metal" are prohibited.

Rigid Non-Metallic Conduit - shall have polyvinyl chloride (PVC) fittings suited for the purpose and joined together by a method approved for the purpose. Schedule 80 conduit sections may be joined together with threaded fitting connectors.

Flexible Metal Conduit - fittings shall be zinc plated steel or cadmium plated malleable iron screw type with insulated throat and angular wedge fitting between convolutions of conduit.

Liquidtight Flexible Metal Conduit - fittings shall be cadmium plated, malleable iron or steel with compression type steel ferrule and neoprene gasket sealing rings, with insulated throat.

Conduits installed concealed in earth fill, concrete or, solid masonry structures shall be PVC 40. PVC shall not be installed in any exposed locations. All exposed exterior conduits shall be GRS. Any GRS installed below grade or in concrete shall have bitumastic applied prior to installation.

Conduits used for connection to recessed lighting fixtures shall be FLEX. Conduits for connection to motors or vibrating equipment shall be LQFLEX not less than 18" long and not over 60" long. All flexible conduits are to be secured at a minimum of every three feet using approved methods.

Conduits run concealed in the hollow space of non-masonry walls or, above suspended/hard ceilings shall be EMT. Exposed conduits shall be run at right angles to or parallel with building lines and exposed structure. In all cases, conduit runs shall be grouped together where possible and shall be supported from the building structure, not from any suspended ceiling support system.

PVC 80 shall be used only where specifically indicated on the drawings and shall be UL listed as sunlight resistant. Install conduits passing through building sidewalls or through beams below grade with expansion/deflection fittings. Install expansion fittings where conduit crosses an expansion joint. Where conduit penetrates damp-proofing membranes, cut the membrane carefully around the conduit and seal the joint with pressure sensitive tape.

All conduit bends are to be made with a device made for the application. All conduit runs are to be parallel or perpendicular to the building structure. Conduit offsets are to be utilized at junction boxes and device boxes and a strap placed on conduit at the point nearest the box for support.

Support raceways securely with pipe straps, wall brackets, conduit hangers or ceiling trapeze. Fastenings shall be by wood screws or screw type nails to wood, by toggle bolts to concrete block, expansion bolts on concrete or brick, and beam clamp types on steel or bar joists. Raceways shall not be fastened to suspended ceiling supports but must have independent support from the structure. Supporting devices shall be of materials having corrosion protection at least equal to the raceway. A support shall be provided as close as practical to, and not exceeding 18" from an unsupported box or from change of direction. In horizontal runs, this support may be omitted if the box is independently supported and the box connection is not made with chase nipple or threadless box connector. In vertical runs, load produced by weight of the raceway and

conductors shall not be carried by the raceway terminal, but must be carried entirely by conduit supports. Install conduit supports in strict accordance with the following table, except as required by support for boxes and changes in direction:

MAXIMUM SUPPORT

<u>TRADE SIZE</u>	<u>LOCATION OF RUNS</u>	<u>SPACING</u>
1/2, 3/4	Exposed, Horizontal	7 feet
1 and larger	Exposed, Horizontal	10 feet
All sizes	Concealed, Horizontal	10 feet
1/2, 3/4	Exposed, Vertical	7 feet
1, 1-1/4	Exposed, Vertical	8 feet
1-1/2 and larger	Exposed, Vertical	10 feet
All sizes	Concealed, Vertical	10 feet

For conduit runs that are not sized on drawings, the maximum conduit fill shall be computed using the requirements for Type THW conductors although the actual wiring is with Type THWN or other type of conductors having smaller cross-sections. This requirement is made to provide spare conduit capacity.

Install all required sleeves for conduits passing through concrete slabs. Fire proof space between conduit and sleeve after installation using of mineral wool as required. All fire wall penetrations are to be sealed with a U. L. approved method. Any penetrations of the roof membrane must be sealed by a certified roofing contractor using an approved method.

Expansion Joints:

Conduits 3" and larger, that are secured to the building structure on opposite sides of a building expansion joint, required expansion and deflection couplings. Install couplings in accordance with the manufacturer's recommendations.

Provide conduits smaller than 3" with junction boxes on both sides of the expansions joint. Connect conduits to junction boxes with sufficient slack of flexible conduit to produce 5" vertical drop midway between ends. Flexible conduit shall have a green copper ground-bonding jumper installed. In lieu of this flexible conduit, expansion and deflection couplings as specified above for three inches and larger conduits are acceptable.

Expansion fittings shall be provided for raceways to compensate for thermal expansion and contraction in conduit runs 200ft or greater and at building expansion joints. Bonding jumpers shall be provided for electrical continuity of the raceway system at the expansion fittings.

Conductors:

All conductors shall be installed in conduit. Conductors for building wiring shall have THHN/THWN, 600-volt insulation and shall be soft-drawn copper of standard American Wire Gauge (AWG) size. Minimum size shall be No. 12. 20-amp branch circuits more than 100 feet in length shall be upsized to No. 10. Provide individual neutral conductors for all single-pole branch circuits. Tied breaker handles are not acceptable. All wire No. 8 and larger shall be stranded. All branch circuits No. 10 and smaller shall be wired with color-coded wire with the same color used for a system throughout the building.

Power feeders and branch circuits larger than No. 10 shall either be fully color coded or shall have black insulation and be similarly color coded with tape or paint in all junction boxes and panels. Where tape or paint is used to identify conductors, apply at all terminations, junction boxes, pull boxes and wireways. Apply tape, butt lapped, or paint for a minimum distance of 2" and, where applied to ends of conductors, start at cut end of the conductor insulation. Tape shall not cover manufacturers conductors shall be color coded or labeled as necessary for clear identification. Color coding of all conductors shall be as follows:

Grounding

120/208 volt Three Phase (wye)

Phase Conductors:

Neutral:

Bare or Green

A-Black, B-Red, C-Blue

White

277/480 volt Three Phase (wye)

Phase Conductors:

A-Brown, B-Orange, C-Yellow

Neutral: Natural Grey

All circuits are to be run with a neutral conductor: No shared neutral conductors are allowed.

Suitable bushings, shields or fittings having smooth rounded edges shall be provided where conductors pass between wire ways, through partitions, around bends, between wire ways and cabinets or junction boxes, and at other locations where necessary to prevent abrasion of the insulation of the conductors. As a clarification, this also applies to conduits stubbed into the ceiling.

JUNCTION AND PULL BOXES

Junction and pull boxes shall meet requirements of National Electrical Code. Standard manufactured boxes shall be listed by Underwriters' Laboratories, Inc. Where custom designed and fabricated boxes are needed, they shall meet the construction standards of Underwriters' Laboratories, Inc. and the N.E.C.

Junction and pull boxes shall be installed where required by National Electrical Code and where necessary to facilitate pulling of wire or cable. Considerations are sizes of wire and cable, number of bends in raceway, and conductor support requirements in vertical raceways. Maximum distance between terminations at junction or pull boxes, cabinets, or other points of termination shall not exceed 250 feet for straight horizontal runs. This length shall be decreased 50 feet for each 90 degree bend. All junction boxes shall be independently and rigidly supported from the building structure. Junction box type shall conform to the area in which it is installed (i.e. wet location areas shall be moisture resistant type junction boxes).

Junction boxes and associated conduit for Fire Alarm shall be painted red. Junction boxes for low voltage controls, communication, technology, etc. shall be permanently marked indicating use.

## OUTLETS

Outlet boxes shall be one piece or projection welded, galvanized stamped steel for gang sizes required. Where several devices are located on drawings in the same general location, use multi-gang boxes. Sectional boxes are not acceptable. Boxes shall be sized in accordance with National Electrical Code. Boxes required for communications systems, mechanical control devices, etc., shall be installed under this section of the specifications. Verify outlet box locations and sizes required for systems other than electrical power from shop and manufacturer's drawings, and install outlets as per those requirements.

Boxes for wall and ceiling outlets shall finish flush and straight. Wall outlets in exposed concrete block, masonry, and tile walls shall be installed with extra deep square corner boxes or with standard boxes and square cornered tile wall covers so that conduit offsets are not required. Openings in concrete blocks or masonry walls shall be saw cut with an opening tolerance of 1/8" on all sides, the opening shall have bottom of box at nearest masonry joint to dimension indicated. For other wall finishes, boxes shall be installed with plaster or device type covers as required. No outlets shall be installed back-to-back. Where outlets occur in stud walls back to back on opposite sides, they shall be isolated by a solid stud between them or shall have a 24" separation. For boxes installed in a fire rated barrier, a U.L. approved putty pad shall be installed as required.

## WIRING DEVICES

Colors: Wiring device and plate colors shall be selected by Architect.

Receptacles: Duplex receptacles shall be specification grade, 20 amps, 125 volts with grounding terminal. The receptacles are to be rigidly secured independent of device plate and such that the device plate secures to the device as the design specifies.

Switches: Standard flush tumbler switches shall be specification grade, 20 amps, 120/277 volts A-C only, single pole, three-way or four-way as shown, single throw with screw terminals arranged for side wiring. The switches are to be rigidly secured independent of device plate and such that the device plate secures to the device as the design specifies.

Device Plates: Shall be of the specification grade high impact resistant, stainless steel plates. The nominal thickness is to be .070". Color to match device.

Ground Fault Receptacles: Furnish and install receptacles with ground fault circuit interrupters as indicated on plans. Receptacles shall be NEMA 5-20R configuration with 120V ac 20 amperes circuit rating. All receptacles shall be such depth as to permit mounting in outlet boxes 1-1/2" or greater in depth without the use of spacers. Units shall have line and load terminals such that connection to load terminals will provide ground fault protection for other receptacles. All receptacles shall accept standard duplex wall plates. All receptacles shall be noise suppressed and shall be UL listed. Any device located within 76" of a source of water is to be GFCI protected.

All devices are to be installed such that devices do not move when in normal use. The

device plate shall not be used to secure device in place.

## LIGHTING FIXTURES

Provide wired, cleaned, and with lamps specified, all fixtures designated on drawings. Contractor shall verify the ceiling construction for correct trim and support arrangement of lighting fixtures; corrosion resistant plaster frames are required in plaster ceilings. Shop drawing submittals shall consist of properly identified copies of manufacturer's catalog pages showing all features and accessories specified.

Secure mounting and support of all lighting fixtures shall be accomplished under this section of these specifications. Lighting fixtures shall be installed plumb, square, and level with the ceiling, wall, and in alignment with adjacent lighting fixtures. Mounting heights indicated shall be to the bottom of the fixture for ceiling-mounted fixtures and to center of fixture for wall-mounted fixtures. Lay-in troffer fixtures shall be supported with a minimum of 4 ceiling support wires per fixture and not more than 6 inches from each corner of the fixture. For fixtures smaller in size than the ceiling grid, provide a minimum of four wires per fixture. Do not support fixtures by ceiling acoustical panels. All concealed fixture mounting accessories shall be securely tied to structure. Flexible connections to fixtures shall not exceed 6 feet in length. Fixtures shall be solidly grounded to raceway system.

In areas where the reflected ceiling plan is shown, all work shall be in conformance with this plan. If the ceiling grid is installed other than shown on the electrical plan, it shall be the responsibility of the installer of the lighting fixtures to call this fact immediately to the attention of the Architect and Contractor, and work shall not proceed until Architect's decision in the matter is obtained.

Fluorescent ballasts shall be electronic type, class A noise rating, class P safety standards, high power factor greater than .98, programmed start, auto restart, 10% total harmonic distortion or less, 42 kHz – 54 kHz hertz ballast frequency, .85 or greater ballast factor, less than 1.7 lamp current crest factor, meeting the requirements of ANSI/IEEE C62.41 & C82.11, FCC Part 18 (RFI & EMI), CBM, UL, Public Law No. 100-357, and NAECA. All ballasts shall include internal fusing. Ballast shall be compatible for use with energy saving lamps. For outdoor applications, ballast shall be rated for zero degrees Fahrenheit starting temperature.

High Intensity Discharge (HID) lamp ballasts shall be high power factor type greater than .98, protected by in-line fuse, UL 1029, UL class P, ANSI C82.4, 15% total harmonic distortion or less, 100 kHz – 200 kHz ballast frequency, end-of-life detection and shutdown. Ballasts in fixtures for interior spaces shall be encapsulated in a Class H potting compound to provide a Class A noise rating. Ballasts in fixtures installed outdoors shall be weatherproof. Provide 0 degrees Fahrenheit starting temperature for HID below 250W. Provide -20 degrees Fahrenheit starting for HID 250W and above.

LED drivers shall be highly efficient, class A noise rating, 0.9 or greater power factor, power supplies rated for the wattage requirements of the fixture. THD at full load shall be <10% at 120v and <20% at 277v. <3% line regulation, <1W stand-by power. LED power up time to be <1 sec. Load regulation <5%. Provide over voltage protection, non-latching output short circuit protection, current reduction LED load temperature



protection. Ambient operating temperature range -30 degrees Celsius to 50 degrees Celsius at 85% non-condensing relative humidity. Driver shall meet ANSI C62.41 Cat.A 2.5kv transient protection. Power supply shall be field programmable with 1mA resolution. Programmer shall not require the power supply to be powered up or connected to AC line voltage while programming. Provide integrated configurable LED thermal protection. Drivers shall be universal voltage input. Power supply shall be UL Class 2. LED dimming drivers shall provide continuous flicker-free dimming from 100%-1%.

All lamps shall be the product of one manufacturer and shall be as manufactured by General Electric Osram/Sylvania, or Phillips. HPS lamps shall comply with the current published ANSI standards.

### TELEPHONE SYSTEM

The Contractor shall furnish and install PVC 40, EMT, boxes, etc. as appropriate, for telephone cables. All turns shall be made with no more than two (2) bends to a run. All telephone conduit is to have bushings provided at both terminated ends. The electrical contractor shall consult the local telephone company for complete rules and regulations and the telephone conduit shall be installed according to these rules.

### PRODUCT DELIVERY, STORAGE AND HANDLING

Protections: Take necessary precautions to protect all material, equipment, apparatus, and work from damage. Failure to do so to the satisfaction of the Architect will be sufficient cause for the rejection of the material, equipment, or work in question. Contractor is responsible for the safety and good condition of the materials installed until final acceptance by the Owner.

Cleaning: Conduit openings shall be capped or plugged during installation. Fixtures and equipment shall be tightly covered and protected against dirt, moisture, chemical, and mechanical injury. At the completion of the work, the fixtures, material and equipment shall be thoroughly cleaned and delivered in condition satisfactory to the Architect.

### PART 3 - EXECUTION

#### EXCAVATION, TRENCHING AND BACKFILLING

Trenches for all underground conduits shall be excavated to the required depth. The bottom of trenches shall be tamped hard. Before backfilling the excavation shall be cleaned of trash and debris. Backfill shall consist of excavation or borrow of sand, gravel, or other approved material free of trash, lumber, sawdust or other debris. Backfill shall be placed in 9" thick moistured and hand or machine tamped layers. Backfill shall be brought to suitable elevation above ground to provide for anticipated settlement and shrinkage. All paving broken up shall be repaired and returned to the original condition.

## PAINTING

Contractor shall touch-up or refinish all items of electrical equipment furnished with a factory finish coat of paint and which may have been damaged regardless of cause.

## TESTING AND BALANCING

Balance all single-phase loads connected to all panelboards to ensure an approximate equal division on these loads on main power supply serving building. All tests shall be made in accordance with the latest standards of the IEEE and the NEC. The installation shall be tested for performance, grounds and insulation resistance. "Megger" type instruments shall be used. Contractor shall perform circuit continuity and operational tests on all equipment furnished or connected by Contractor. The tests shall be made prior to final inspection. The Contractor shall provide all testing equipment and all costs shall be borne by him. Written reports shall be made of all tests. These reports shall be turned over to the Architect at time of final inspection. All faults shall be corrected immediately.

## CLEANING UP

The Contractor shall remove all oil, grease, or other stains resulting from his work performed in the building or the exterior thereof.

## WARRANTY AND MAINTENANCE

The Electrical Systems and associated materials shall be covered by the warranty for a period of one year. All materials, installation, and workmanship shall be warranted during the warranty period. That is, any item will be repaired at no charge for any defects for one year after the date of acceptance.

END OF SECTION 16100

## SECTION 16110 - LIGHTING CONTROLS

### PART 1 - GENERAL

#### INTRODUCTION

The work covered in this section is subject to the requirements in the General Conditions of the Specifications. Contractor shall coordinate the work in this section with the trades covered in other sections of the specification to provide a complete and operable system.

#### SYSTEM DESCRIPTION

Extent of lighting control system work is indicated by drawings and by the requirements of this section. It is the intent of this section to provide an integrated, energy saving lighting control system including Lighting Control Panels, Occupancy Sensors, and Daylighting Controls from a single supplier. Contractor is responsible for confirming that the panels and sensors interoperate as a single system.

#### QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in the manufacture of lighting control equipment and ancillary equipment, of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

Comply with NEC, NEMA, and FCC Emission requirements for Class A applications.

UL Approvals: Relay panels and accessory devices are to be UL listed under UL 916 Energy Management Equipment. Configured to order or custom relay panels shall be UL Listed under UL 508, Industrial Control Panels.

#### SUBMITTALS

Submit manufacturer's data on lighting control system and components including shop drawings, detailed point to point wiring diagrams, and floor plans showing occupancy and daylighting sensor locations. Provide typical mounting details for occupancy and daylighting sensors for this application.

#### MANUFACTURERS

This specification is based on products from Watt Stopper/Legrand, Santa Clara, CA. Any other system wishing to be considered must submit descriptive information 10 days prior to bid. Prior approval does not guarantee final approval by the electrical engineer. The contractor shall be completely responsible for providing a system meeting this specification in its entirety. All deviations from this specification must be listed and individually signed off by the consultant.

## PART 2 - PRODUCTS

### OCCUPANCY SENSORS AND POWER PACKS

#### Occupancy Sensors:

All products listed are Watt Stopper product numbers and will integrate fully with the Lighting Control system listed in the project specifications.

Ceiling sensors: DT-200, DT-300.

Wall sensors: DW-100:

#### Dual technology sensors shall:

Use passive infrared and ultrasonic technologies for occupancy detection. Products that react to noise or ambient sound shall may be considered.

#### Ultrasonic sensors shall:

Utilize Advanced Signal Processing to adjust the detection threshold dynamically to compensate for constantly changing levels of activity and airflow throughout controlled space.

Have an ultrasonic operating frequency that is crystal controlled at 25 kHz within  $\pm 0.005\%$  tolerance, 32 kHz within  $\pm 0.002\%$  tolerance, or 40 kHz  $\pm 0.002\%$  tolerance to assure reliable performance and eliminate sensor cross-talk. Sensors using multiple frequencies are not acceptable.

All sensors shall be capable of operating normally with electronic ballasts, PL lamp systems and rated motor loads.

Coverage of sensors shall remain constant after sensitivity control has been set. No automatic reduction shall occur in coverage due to the cycling of air conditioner or heating fans.

All sensors shall have readily accessible, user adjustable settings for time delay and sensitivity. Settings shall be located on the sensor (not the control unit).

All sensors shall provide an LED as a visual means of indication at all times to verify that motion is being detected during both testing and normal operation.

#### Circuit Control Hardware – (POWER PACKS)

Control Units - For ease of mounting, installation and future service, control unit(s) shall be able to externally mount through a 1/2" knock-out on a standard electrical enclosure and be an integrated, self-contained unit consisting internally of an isolated load switching control relay and a transformer to provide low-voltage power. Control unit shall provide power to a minimum of two (2) sensors.

Relay Contacts shall have ratings of:

13A - 120 VAC Tungsten  
20A - 120 VAC Ballast  
20A - 277 VAC Ballast  
20A – 347 VAC Ballast

Control wiring between sensors and control units shall be Class II, 18-20 AWG, stranded U.L. Classified, PVC insulated or TEFLON jacketed cable suitable for use in plenums, where applicable:

1. Minimum acceptable wire gauge from the circuit control hardware relays shall be #14 AWG.

### EXTERIOR PHOTOCELLS

Each photocell shall be mounted in the appropriate location for measuring the available daylight. Each photocell will have a separate control/calibration module mounted separately and in an accessible location.

### PART 3 - EXECUTION

#### SUPPORT SERVICES

##### Service Description:

##### System Startup:

Manufacturer shall provide a factory authorized technician to confirm proper installation and operation of all system components. The startup requirement is intended to verify:

That all occupancy and daylighting sensors are located, installed, and adjusted as intended by the factory.

The occupancy sensors and daylighting sensors are operating within the manufacturers specifications.

The sensors interact as a complete and operational system to meet the design intent.

Manufacturer to provide a written statement verifying that the system meets the above requirements.

##### Training:

Manufacturer shall provide factory authorized technician to train owner personnel in the operation, programming and maintenance of the lighting control system.

##### Documentation:

Manufacturer shall provide system documentation including:

System one-line showing number and type of switches and sensors, dataline.  
Typical wiring diagrams for each component.

The manufacturer will certify that the products will meet the product specifications and local energy codes. If any additional equipment is required to meet the coverage patterns or local energy codes, the manufacturer will provide the additional equipment at no cost to the owner.

Programming:

Manufacturer shall provide system programming including:

Wiring documentation.

Switch operation.

Operating schedules.

END OF SECTION 16110

## SECTION 16200 – SURGE SUPPRESSION DEVICE

### PART 1 – GENERAL

#### RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions, Special Conditions, Mechanical and Electrical Supplementary Requirements 15000/16000, and Division 1 Specification sections, apply to work specified in this section.

#### DEFINITIONS

LED: Light Emitting Diode

SCR: Silicon Controlled Rectifier

SPD: Transient Voltage Surge Suppressor

#### SUBMITTALS

Provide submittals for all required testing and pertinent manufacturer information described herein. Submittals for products by manufacturers not listed as “acceptable” below, must submit proper documentation showing detailed (line-by-line) compliance with this specification not less than fifteen (15) business days prior to bid date, to allow ample engineering time for review of submitted products. Prior approvals not received by the deadline date defined above will not be considered. Along with the line-by-line comparison from manufacturers not listed herein, surge suppression submittals shall include, but shall not be limited to the following items:

Dimensioned drawing of each suppressor type indicating mounting arrangement.

Manufacturer shall include its UL 1449 Second Edition file number(s).

Manufacturer shall include its UL 1283 file number(s).

Letter from manufacturer verifying SPD incorporates “directly-connected-protection - elements” between all possible modes in every given service rating (i.e. line-to-neutral, line-to-line, line-to-ground, neutral-to-ground).

Certified test data documenting IEEE C62.41.2 performance (as defined herein), and the ability of the device to meet or exceed all requirements of this specification.

Warranties: As specified in this Section.

#### QUALITY ASSURANCE

Manufacturer Qualifications: At least 10 years of engineering experience in the design and manufacture of permanently connected SPD devices.

Operates a Quality System Certified manufacturing facility as ISO 9001:2000 Compliant.

#### CODES AND REFERENCED STANDARDS

UL 1449 2<sup>nd</sup> Edition listed, UL 1283 listed, CUL, ANSI/IEEE C62.41.1-2002, C62.41.2-2002, C62.45-2002, NEMA LS-1, 1992 2.2.7, IEEE Std. 1100-1999 Section 8.6.1  
ANSI C84.1, American National Standard for Electric Power Systems and Equipment – Voltage Ratings.

### SUPPRESSOR LOCATIONS

Provide surge suppressor at each building service entrance switchboard and at other panelboard locations as indicated on the Contract Drawings. SPD Devices are to be mounted integrally to the panels.

### MANUFACTURERS

The listing of a manufacturer as “acceptable” does not imply automatic approval. It is the sole responsibility of the Contractor to ensure that any submittals made are for products that meet or exceed the specifications included herein. Subject to compliance with requirements, provide products by the following manufacturer(s) or approved equal as described above:

Commonality: All SPD devices at the service entrance, distribution panels and sub-panels shall be provided by same SPD manufacturer.

Approved equals will be accepted (see submittal procedures per section 16100).

### GENERAL REQUIREMENTS

SPD devices shall be rated for the class of service necessary for the application. SPD devices shall be designed for AC power systems with a minimum of AC follow current after operation.

The SPD shall have sine-wave tracking capability.

Manufacturer shall provide permanently-connected devices mounted parallel to the service, distribution and sub panels and series connected devices as required for individual equipment protection as indicated on Contract Drawings. SPD device drawings shall be made available upon request.

SPD circuitry shall include only solid-state clamping components to limit the surge voltage and divert the surge current. SPD components that “crowbar” (e.g. spark gaps, gas tubes, SCR’s, etc...) shall not be accepted. Device circuitry shall be bi-directional, enclosed in a UL listed encapsulated thermal stress reducing compound and be of a parallel design.

Electrical performance characteristics:

Service ratings:

120/208V	Three-phase	4-Wire +	Wye
277/480V		Gnd	

Other voltages (as indicated on the drawings)

SPD ratings: SPD devices supplied shall meet or exceed (as a minimum) the capabilities listed below:

TABLE ON NEXT PAGE



Modes Of Protection Required  (10) TEN independent, dedicated, discrete modes of protection required)	<sup>b</sup> Max. ANSI/IEEE Let-Through Voltage  <b>Category C (Main Service)</b>  <b>208/480 3PH</b>	<sup>b</sup> Max. ANSI/IEEE Let-Through Voltage  <b>Category B (Distribution)</b>  <b>208/480 3PH</b>	<sup>c</sup> Max. ANSI/IEEE Let-Through Voltage  <b>Category A (Branch)</b>  <b>208/480 3PH</b>	Peak Surge Current <sup>a</sup> “kA” (Per Phase)		
				**Service Entrance	**Dist. Panels	**Branch Panels
<b>L-N</b>	940/1250	410/580	40/70	360kA	240kA	180kA
<b>L-L</b>	1200/1450	600/800	40/145	360kA	240kA	180kA
<b>L-G</b>	835/1150	410/600	60/100	360kA	240kA	180kA
<b>N-G</b>	880/1450	675/1100	60/70	360kA	240kA	180kA

\*\* For clarification purposes, higher (and lower) peak surge current (PSC) ratings are required for specific panels. Please verify the Peak Surge Currents per the amperages of the equipment that is being protected, are in accordance with the recommendations below:

**4000 Amps and Higher = 600kA “per phase”**  
**240kA “per phase”**

**800 Amps – 1600 Amps =**

**3000 Amps – 4000 Amps = 480kA “per phase”**  
**180kA “per phase”**

**225 Amps – 800 Amps =**

**2000 Amps – 3000 Amps = 360kA “per phase”**  
**120kA “per phase”**

**100 Amps – 225 Amps =**

<sup>a</sup> kA “per phase” value is determined by the following:

[kA “per mode” (x) # of modes available, subtract N-G value, divide the remaining kA by phase(s). The sum will be your kA “per phase”]

<sup>b</sup> Measured at IEEE C62.41.2-2002 Category C High; 20kV 1.2x50 μS/10 kA 8 x 20μS waveform & Category C Low/B High; 6kV, 1.2x50 μS/3 kA 8 x 20μS waveform.

Transient shall be applied at the 90° phase angle unless otherwise indicated above.

<sup>c</sup> Measured at IEEE C62.41.2-2002 Category A-Ringwave at 2kV 0.5 μS/67A 100kHz. Transient shall be applied at the 270° phase angle, positive polarity unless otherwise indicated above.

Measured Limiting Voltage Test Environment: All voltages shall be peak ( $\pm 10\%$ ) Positive Polarity, Time base =  $20\mu\text{s}$ , Sampling Rate =  $250\text{ms/s}$  to ensure maximum transient capture. Surge voltages shall be measured from the insertion of the surge on the sine wave to the peak of the surge. All tests are Static (un-powered), except for the 120V circuits which are Dynamic (powered). All tests shall be performed in accordance with UL 1449 Second Edition with measurements performed at a point on the leads 15.24 cm (6 inches) outside of the device enclosure. No data measured at a module, lugs, component, or undefined location will be accepted.

Modes: The SPD system shall provide dedicated, independent, distinct protection circuitry for every mode found in the electrical distribution system at the point of SPD application. For example, a 400/230V, 3-phase Wye, 4-wire plus ground system has TEN (10) distinct modes that require independent and dedicated protection (i.e., L1-L2, L2-L3, L3-L1, L1-N, L2-N, L3-N, L1-G, L2-G, L3-G, N-G). For 6 mode Delta systems, SIX (6) dedicated, independent, distinct protection modes are required (L1-L2, L2-L3, L3-L1, L1-G, L2-G, L3-G).

Fusing:

The SPD shall provide as a minimum, over-current, over temperature protection in the form of component-level thermal fusing to ensure safe failure and prevent thermal runaway. Surge protective devices shall contain short circuit current safety fusing within each device where no circuit breaker is specified, for over-current requirements of the NEC.

The fusing mechanisms employed must effectively coordinate their performance in conjunction with the high current abnormal over-voltage testing under UL 1449 2<sup>nd</sup> Edition.

The Transient Voltage Surge Suppressor (SPD) shall be of a parallel design using fast-acting transient energy protection that will divert and dissipate the surge energy. The SPD shall be self-restoring and fully automatic with a total response time approximately 1 nanosecond.

The maximum continuous operating voltage shall be capable of sustaining 115% of nominal RMS voltage continuously without degrading.

The SPD shall be UL listed at or above the available fault current level at the point of SPD application, per UL 1449 2<sup>nd</sup> Edition, as amended. The SPD shall be marked with the short circuit current rating. The SPD short circuit rating shall be, as a minimum, the same rating as the power distribution equipment to which it is connected.

Circuit Configuration: The circuit configuration of the suppression units shall be bi-directional, thermal stress reducing, totally encapsulated, custom parallel and solid state.

Features: Surge protective devices shall provide on-board visual status of their operational readiness by LED indicator lights.

Maintenance Restrictions: No suppression unit shall be supplied which requires scheduled preventive- maintenance or replacement parts. Units requiring functional testing, special test equipment, or special training to monitor surge protection device (SPD) status are not acceptable. SPD devices shall require no routine maintenance.

SPD devices are considered non-repairable items and shall be fully replaced upon expiration.

Warranty: The manufacturer shall provide unlimited free replacement of the entire SPD (not just modules, components or sub-assemblies) for all inoperable SPD during the warranty period. Minimum warranty period shall be 10 (TEN) years.

Enclosures: Unless otherwise noted, NEMA 4 (or better) enclosures for indoor installations where fire suppression systems are utilized and NEMA 4X or better enclosures for outdoor/wet locations shall be utilized.

### PART 3 – EXECUTION

Provide surge suppressor to be installed at each building service entrance gear, transfer switch, or other location (service entrance), that the service encounters as it enters the facility and/or as indicated on Contract Drawings. Also, provide SPD devices at all distribution and panel-board locations as indicated on Contract Drawings. The SPD shall be located immediately adjacent to the switchboard or panel-board being protected (close-nipple). (The SPD may not be located integral within the switchboard or panel-board(s) unless the switchgear manufacturer providing such products expressly meets or exceeds all parameters of this specification for the SPD.) Any SPD devices not meeting or exceeding the performance of this specification will be deemed unacceptable. The surge protection devices shall be connected on the load side of the over-current protective device to which it is connected as per UL 1449 and NEC Art. 285, of the electrical service it is protecting. Unless otherwise specified, provide a 30A breaker for each SPD device.

**\*\*NOTE\*\*** SPD marked L1, L2, L3, N, and GND (as applicable) must be connected, respectively, to phase(s), neutral, and ground.

Surge protective devices shall be installed neatly. Bind the phase, neutral, and ground conductors tightly, over the entire run, from the suppressor to the service panel, and always use the shortest length of connecting cable possible.

Connect surge protector to the grounding system.

The electrical contractor (installer) shall verify the proper application of the SPD (i.e., voltage, phases, etc.). The electrical contractor shall assure that all Neutral conductors are bonded to the system Ground at the service entrance or the serving isolation transformer prior to installation of the associated SPD. The electrical contractor shall further ensure that neutral-to-ground bonds do not exist at locations that are not service entrances or newly derived power sources.

All labor, materials, equipment, and services necessary for, and incidental to, the installation of the SPD system components as specified herein shall be provided by the electrical contractor (installer).

END OF SECTION 16200

## SECTION 16300 - LOW VOLTAGE DRY TRANSFORMERS

### PART 1 - GENERAL

#### GENERAL

Self-cooled, dry type two winding power transformer for general power and lighting application. Listed by Underwriters' Laboratories, Inc., and labeled with appropriate listing mark. Single or three phase as indicated with KVA rating as indicated. Separate coil for each phase of three phase units. Unless otherwise indicated, designed for 480 volt primary. Three phase transformers connected delta-wye with 120/208 volt wye secondary unless otherwise indicated. Single-phase units with 120/240 volt secondary unless otherwise indicated. Enclosure for indoor application. Ventilation openings, corrosion treatment, cable space, ground pad, wiring compartment temperature, and wiring terminations in accordance with UL 506.

Primary Taps: 25 KVA and smaller; four 2-1/2% taps, two above and two below normal. Larger than 25 KVA; six 2½% taps, two above and four below normal.

Temperature Classification: 25 KVA and smaller; 185°C insulation system temperature classification, 115°C winding temperature rise. Larger than 25 KVA; 220°C insulation system temperature classification, 115°C winding temperature rise.

Load Rating: Capable of operating continuously at full nameplate rating in 40°C ambient. Capable of withstanding daily overload requirements of ANSI-C57.12 with no loss in normal life expectancy.

Sound Rating: In accordance with ANSI-C89 and NEMA standard sound ratings.

Impedance: 75 KVA and smaller; 3.0% impedance, minimum. Larger than 75 KVA; 4.5% impedance, minimum.

15KVA and Smaller: May be wall mounted with suitable frame supports providing wall is of sufficient strength to adequately support imposed load, and providing such method is acceptable to Architect, unless otherwise indicated on the drawings.

Larger than 15 KVA: Floor mount.

For non linear loads use a minimum of K-13 or ASF shown on drawing.  
Transformers are to have copper windings and be NEMA-TP1 rated.

Acceptable: General Electric; Siemens; Westinghouse; Sorgel; Schneider.

END OF SECTION 16300

## SECTION 16720 - FIRE DETECTION AND ALARM SYSTEMS

### PART 1 - GENERAL

#### SUMMARY

Includes But Not Limited To

Furnish and install a fire alarm and detection system as described in Contract Documents.

Furnish and install raceway, conductors, boxes, and miscellaneous items necessary for complete system.

Related Sections

Division 16 - Quality and installation standards for wiring, raceway, conduit, and boxes.

#### SYSTEM DESCRIPTION

An automatic fire alarm system consisting of control panel, power supplies, alarm initiating devices, and notification appliances.

Class B (Style B) initiating device circuits and Class B (Style W) notification appliance circuits including end-of-line devices.

#### Performance Requirements

Operation of manual station or automatic activation of any smoke detector, shall:

Cause system notification appliances to operate.

Indicate device in alarm at control pane LCD display.

Indicate device in alarm on remote annunciator LCD display

Initiate off-site alarm notification system.

System shall return to normal when operated device is returned to normal and control panel is manually reset, except alarms may be silenced as specified below.

Alarm may be silenced by switch in control panel.

Ring Back Feature - When silenced, this shall not prevent the resounding of subsequent alarms if another zone should alarm.

When alarms are silenced, indicating red LEDs on control panel and remote annunciator shall remain on until operated device is returned to normal and control panel is manually reset.

Green pilot LED shall normally be on indicating that system is receiving normal power.

Failure of normal power shall cause this LED to extinguish.

Amber trouble LED and trouble alarm, operating together, shall signal trouble condition.

Following conditions shall signal trouble condition:

Failure of normal power.

Opens or short circuits on indicating circuits.

Disarrangements in system wiring.

Control panel circuit board removal.

Ground faults.

Trouble silencing switch shall silence trouble alarm which shall be arranged so trouble LED shall remain lit until system is restored to normal. As ring-back feature, trouble alarm shall resound as reminder to return silencing switch to normal position.

Supervisory LED, separate from trouble LED, and alarm, operating together, shall signal opening of door shown on drawings. Alarm silence switch shall operate in same manner as trouble alarm.

SUBMITTALS

Shop Drawings:

Prepared by authorized factory representative and including:

Single line diagram of actual system. Typical riser diagrams are not acceptable.

Complete wiring diagrams.

Manufacturer's original catalog data and descriptive information on each piece of equipment to be used.

All documentation and submittals required by the Authority Having Jurisdiction are to be submitted within 30 day of the contract award.

Approval of the Authority Having Jurisdiction and permitting are required before work on the project is to commence.

Quality Assurance/Control - Certificate of completion, from Manufacturer's Representative, in accordance with NFPA 72 requirements.

Closeout:

Operations And Maintenance Manual Data:

Provide operating and maintenance instructions for each item of equipment submitted under Product Data. Provide instruction manual from Manufacturer which explains what is to be done in event of various indications.

Include copy of approved shop drawings.

## QUALITY ASSURANCE

### Regulatory Requirements:

System shall meet approval of Authority Having Jurisdiction (AHJ). NEC and local ordinances and regulations shall govern unless more stringent requirements are specified.

Equipment, devices, and cable shall be UL or Factory Mutual listed for use in fire alarm systems.

## OWNER'S INSTRUCTIONS

Instruct Owner's representative in proper operation and maintenance procedures.

## PART 2 - PRODUCTS

### COMPONENTS

Equipment and accessories furnished under terms of this Specification shall be standard products of single manufacturer, or include written statement by Control Panel Manufacturer confirming compatibility of components and inclusion of these components under system warranty.

Main FACP or network node shall contain a microprocessor based Central Processing Unit (CPU) and power supply. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system controlled devices.

### Operator Control

#### Acknowledge Switch:

Activation of the control panel acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the LCD display to the next alarm or trouble condition.

Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.

Alarm Silence Switch: Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.

Alarm Activate (Drill) Switch: The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.

System Reset Switch: Activation of the System Reset switch shall cause all electronically-latched initiating devices, appliances or software zones, as well as all

associated output devices and circuits, to return to their normal condition.

Lamp Test: The Lamp Test switch shall activate all local system LEDs, light each segment of the liquid crystal display and display the panel software revision for service personnel.

System Capacity and General Operation:

The control panel or each network node shall include Form-C alarm, trouble, and supervisory relays rated at a minimum of 2.0 amps @ 30 VDC.

It shall include Class B (NFPA Style Y) or Class A (NFPA Style Z) programmable Notification Appliance Circuits.

The Notification Appliance Circuits shall be programmable to Synchronize with System Sensor, and Notification Appliances.

The system shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color coded system status LEDs, and an alphanumeric keypad with easy touch keys for the field programming and control of the fire alarm system.

The system shall be programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers.

The system shall allow the programming of any input to activate any output or group of outputs

The FACP or each network node shall provide the following features:

Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.

Detector sensitivity test, meeting requirements of NFPA 72, Chapter 7.

Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.

Multiple sensitivity levels for alarm, selected by detector. The system shall also support sensitive advanced detection laser detectors. The system shall also include multiple levels of Prealarm, selected by detector, to indicate impending alarms to maintenance personnel.

The ability to display or print system reports.

Alarm verification, with counters and a trouble indication to alert maintenance personnel.

PAS presignal, meeting NFPA 72 3-8.3 requirements.

Devices shall meet NFPA 72 Chapter 1 requirements for activation of notification circuits within 10 seconds of initiating device activation.



Periodic detector test, conducted automatically by the software.

Self optimizing pre-alarm for advanced fire warning, which allows each detector to learn its particular environment and set its prealarm level to just above normal peaks.

Cross zoning with the capability of counting: two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.

Walk test, with a check for two detectors set to same address.

Day/night automatic adjustment of detector sensitivity.

The FACP shall be capable of coding main panel node notification circuits in March Time (120 PPM), and Temporal (NFPA 72 A-2-2.2.2). Panel notification circuits (NAC 1,2,3 and 4) shall also support Two-Stage operation. Two stage operation shall allow 20 Pulses Per Minute (PPM) on alarm and 120 PPM after 5 minutes or when a second device activates.

#### Network Communication

The FACP shall be capable of communicating on a Local Area Network (LAN), a firmware package that utilizes a peer-to-peer, inherently regenerative communication format and protocol.

#### Central Microprocessor

The microprocessor shall be a state-of-the-art, high speed device and it shall communicate with, monitor and control all external interfaces. It shall include an EPROM for system program storage, Flash memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.

The microprocessor shall contain and execute all control-by-event programs for specific action to be taken if an alarm condition is detected by the system. Control-by-event equations shall be held in non-volatile programmable memory, and shall not be lost even if system primary and secondary power failure occurs.

The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file. The time-of-day and date shall not be lost if system primary and secondary power supplies fail. The real time clock may also be used to control non-fire functions at programmed time-of-day, day-of-week, and day-of-year.

A special program check function shall be provided to detect common operator errors.

An auto-program (self-learn) function shall be provided to quickly install initial functions and make the system operational.

For flexibility and to ensure program validity, an optional Windows(TM) based program utility shall be available. This program shall be used to off-line program the system with batch upload/download, and have the ability to upgrade the manufacturers (FLASH) system code changes. This program shall also have a verification utility, which scans the program files, identifying possible errors. It shall also have the ability to compare old program files to new ones, identifying differences in the two files to allow complete

testing of any system operating changes. This shall be in compliance with the NFPA 72 requirements for testing after system modification.

### System Display

The system shall support the following display mode options:

80 character display option. The display shall include an 80-character backlit alphanumeric Liquid Crystal Display (LCD) and a full PC style QWERTY keypad.

The display shall provide all the controls and indicators used by the system operator: The 80-character display shall include the following operator control switches: ACKNOWLEDGE, ALARM SILENCE, ALARM ACTIVATE (drill), SYSTEM RESET, and LAMP TEST.

The display shall annunciate status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.

The display shall also provide Light-Emitting Diodes.

The 80-character display shall provide 12 Light-Emitting-Diodes (LEDs), that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM WARNING, SUPERVISORY SIGNAL, SYSTEM TROUBLE, DISABLED POINTS, ALARM SILENCED, Controls Active, Pre-Discharge, Discharge and Abort.

The display shall have QWERTY type keypad.

The 80-character display keypad shall be an easy to use QWERTY type keypad, similar to a PC keyboard. This shall be part of the standard system and have the capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.

The system shall support the display of battery charging current and voltage on the 80-character LCD display.

### Voice Command Center (VCC)

The facility shall have an emergency voice alarm communication system. Digitally stored message sequences shall notify the building occupants that a fire or life safety condition has been reported. A Message generator shall be capable of automatically distributing up to four (4) simultaneous, unique messages to appropriate audio zones within the facility based on the type and location of the initiating event. The Fire Command Center (FCC) shall also support Emergency manual voice announcement capability for both system wide or selected audio zones, and shall include provisions for the system operator to override automatic messages system wide or in selected zones.

The digital audio message generator shall be of reliable, non-moving parts, and support the digital storage of at least 16 or 32 minutes of tones and emergency messages, shall support programming options to string audio segments together to create up to 1000 messages, or to loop messages and parts of messages to repeat for pre-determined cycles or indefinitely.

The audio portion of the system shall sound the proper audio signal (consisting of tone,

voice, or tone and voice) to the appropriate zones.

Notification Appliance Circuits (NAC) speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke zone which ever is greater.

Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.

Speaker circuits shall be electrically supervised for open and short circuit conditions. If a short circuit exists on a speaker circuit, it shall not be possible to activate that circuit.

Speaker circuits shall be either 25 VRMS or 70VRMS. Speaker circuits shall have 20% space capacity for future expansion or increased power output requirements.

The emergency voice alarm communication system shall incorporate a Two-way emergency telephone communication system.

Two-way emergency telephone communication circuits shall be supervised for open and short circuit conditions.

Two-way emergency telephone (Fire Fighter Telephone) communication shall be supported between the Audio Command Center and up to seven (7) remote Fire Fighter's Telephone locations simultaneously on a telephone riser.

Means shall be provided to connect FFT voice communications to the speaker circuits in order to allow voice paging over the speaker circuit from a telephone handset.

#### Alarm Initiating Devices:

Ceiling Mounted Smoke Detectors - Combination of photoelectric and thermal type.

Photoelectric type.

Listed under UL Standard 268.

Provide visual indication of alarm on unit when normally pulsed supervisory LED glows continuously.

#### Duct Mounted Smoke Detectors:

Photoelectric type.

Listed under UL Standard 268.

#### Manual Fire Alarm Boxes:

Double-action requiring two actions to initiate alarm.

Box shall mechanically latch when actuated and require key to reset. Key shall match control panel door lock.

#### Notification Appliances:

##### Combination Horn/Strobe:

Wall mounted flush or semi-flush.

Non-coded audible output of 90 dB minimum at 10 feet.

Integrally mounted flashing light unit with block letters 'FIRE'. Minimum light intensity of 75 candela and flash rate between one and three Hertz.  
Listed under UL Standards 464 and 1971.

Strobe Only:

Wall mounted flush or semi-flush.

Integrally mounted flashing light unit with block letters 'FIRE'. Minimum light intensity of 75 candela and flash rate between one and three Hertz.  
Listed under UL Standard 1971.

Speakers:

All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 Watts.

Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).

Frequency response shall be a minimum of 400 HZ to 4000 HZ.

The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

Accessory Devices:

Air handler shutdown relays. Provide and install an addressable interface module at the air handling units to shut down activation of the appropriate level alarm.

ACCEPTABLE MANUFACTURERS

Existing main fire alarm control is a Simplex Model 4005 system. The fire alarm panel for the new building shall be a Simplex model 4007 or equal. New panel shall be compatible with existing fire alarm system. New panel shall be an addressable type that can be integrated with the existing zone type system to have one fully functional campus wide fire alarm system.

Cerebrus Pyrotronics, Cedar Knolls, NJ (973) 593-2600  
Edwards Systems Technology, Cheshire, CT (203) 699-9300  
Faraday Inc, Tecumseh, MI (517) 423-2111  
Honeywell, Minneapolis, MN (800) 328-5111  
Notifier, Northford, CT (800) 454-9779  
Simplex, Gardner, MA (800) 221-7336

PART 3 - EXECUTION

INSTALLATION

Install fire alarm and detection systems as indicated, in accordance with equipment manufacturer's written instructions, and complying with applicable portions of NEC, NFPA and NECA's 'Standard of Installation'.

### Mounting Heights:

Unless otherwise indicated, mount center of outlets or boxes at following heights above finish floor:

Manual Fire Alarm Boxes (Pull Stations) - 48 inches

Fire Alarm Horns/Strobes - 80 inches

### Conductors:

Install conductors in conduit.

Fire alarm system conductors from different devices may be combined in common conduit. Make certain that raceway size and wire quantity, size, and type is suitable for equipment supplied and is within NEC standards. Label pull and junction boxes 'FIRE ALARM'.

Install conductors and make connections to elevator control panel and duct smoke detectors.

Loop wires through each device on zone for proper supervision. Tee-taps not permitted.

Minimum conductor size shall be 14 AWG unless otherwise specified.

Do not install ceiling mounted detectors within 3 feet of air discharge grilles. Do not install manual fire alarm boxes close to light switches. Coordinate with other trades as required.

## FIELD QUALITY CONTROL

### Manufacturer's Field Service:

Provide factory trained representative to perform complete system testing in presence of Owner's representative and local fire department personnel upon completion of installation.

Test each initiating and annunciating device for proper operation, except fixed temperature heat detectors.

Test operation of trouble annunciation on each circuit.

Perform complete testing of control panel functions.

## PROTECTION

Provide dust protection for installed smoke detectors until finish work is completed and building is ready for occupancy.

Protect conductors from cuts, abrasion and other damage during construction.

END OF SECTION 16720

## SECTION 16730 - GPS WIRELESS CLOCK SYSTEMS

### PART 1 - GENERAL

Reference Division 16730 Clock Systems

### SECTION INCLUDES

#### Transmission Systems

G.P.S. Receiver  
Primary Transmitter

#### Clocks

Analog (120V)

### RELATED SECTIONS

#### Division 16

Electrical (120 volt grounded dedicated outlet required for transmitter and each analog clock).

### REFERENCES

This Technical Specification and Associated Drawings

Wireless GPS Satellite Time System User Manual.

### DEFINITIONS

GPS: Global Positioning System, a worldwide system that employs 24 satellites in an integrated network to determine geographic location anywhere in the world, and which employs and transmits atomic time, the most accurate and reliable time.

### SYSTEM DESCRIPTION

GPS wireless clock system shall continually synchronize clocks throughout the facility, and shall be capable of clock readouts in multiple time zones where desired.

The system shall synchronize all clocks to each other. The system shall utilize GPS technology to provide atomic time. The system shall not require hard wiring. Clocks shall automatically adjust for Daylight Savings Time.

Analog Clocks shall be synchronized to within 10 milliseconds 6 times per day, and the system shall have an internal oscillator that maintains plus or minus one second per day between synchronizations, so that clock accuracy shall not exceed plus or minus 0.2

seconds.

The system shall include an internal clock reference so that failure of the GPS signal shall not cause the clocks to fail in indicating time.

The system shall incorporate a “fail-safe” design so that failure of any component shall not cause failure of the system. Upon restoration of power or repair of failed component, the system shall resume normal operation without the need to reset the system or any component thereof.

Clock locations shall be as indicated, and clocks shall be fully portable, capable of being relocated at any time.

The system must operate in accordance with a “Radio Station Authorization”, Form FCC 601 – LM, granted by the Federal Communications Commission (FCC). This license will be issued to and held by the end user.

### REGULATORY REQUIREMENTS:

Equipment and components furnished shall be of manufacturer’s latest model.

The end user will hold a license, known as a “Radio Station Authorization” granted by the FCC.

This license grants the end user protected use for wireless transmission at the designated frequency.

This license will designate a unique “call sign” for each end user.

Transmitter and receiver shall comply with Part 90 of FCC rules as follows:

This device may not cause harmful interference, and

This device must accept interference received, including interference that may cause undesired operation.

Transmitter frequency shall be governed by FCC Part 90.35.

Transmitter output power shall be governed by FCC Part 90 257 (b)

System shall be installed in compliance with local and state authorities having jurisdiction.

### SUBMITTALS

Product Data: Submit complete catalog data for each component, describing physical characteristics and method of installation. Submit brochure showing available colors and finishes of clocks.

Operating License: Submit evidence of application for FCC Radio Station Authorization

prior to installing equipment. Furnish the license or a copy of the application for the license, to the Owner prior to operating the equipment. The original license must be delivered to the Owner.

Samples: Submit one clock for approval. Approved sample shall be tagged and shall be installed in the work at location directed.

Manufacturer's Instructions: Submit complete installation, set-up and maintenance instructions.

Floor plans indicating the location of system transmitter(s), approved by manufacturer, will be submitted to owner prior to installation.

## SUBSTITUTIONS

Proposed substitutions, to be considered, shall be manufactured of equivalent materials that meet or exceed specified requirements of this Section.

Proposed substitutions shall be identified not less than 10 days prior to bid date.

Other systems requiring wiring and/or conduit between master and clocks will not be accepted.

Other systems using wireless technology in an unlicensed frequency range will not be accepted.

Other systems using wireless technology where the license is held by any party other than the end user will not be accepted.

## QUALITY ASSURANCE:

### Permits

Obtain operating license for the transmitter from the FCC.

### Qualifications

Manufacturer: Company specializing in manufacturing commercial time system products with a minimum of 30 continuous years of documented experience including 4 years experience producing GPS wireless time systems.

Installer: Company with documented experience in the installation of commercial time systems.

Prior to installation, a site survey must be performed to determine proper transmitter placement.

## DELIVERY, STORAGE, AND HANDLING

Deliver all components to the site in the manufacturer's original packaging. Packaging shall contain manufacturer's name and address, product identification number, and



other related information.

Store equipment in finished building, unopened containers until ready for installation.

## PROJECT SITE CONDITIONS

Clocks shall not be installed until painting and other finish work in each room is complete.

Coordinate installation of GPS receiver for access to the roof or exterior side wall so that the bracket and related fasteners are watertight.

## SYSTEM STARTUP

At completion of installation and prior to final acceptance, turn on the equipment; ensure that all equipment is operating properly, and that all clocks are functioning.

## WARRANTY

Manufacturer will provide a 5 year warranty on GPS receiver, transmitter, and satellite transmitter. All other components will have a 1 year warranty.

## PART 2 - PRODUCTS

### MANUFACTURER

GPS wireless clock system shall be manufactured by SIOSCAN Wireless, Inc., or approved manufacturer with an equal system.

### SEQUENCE OF OPERATION:

**Transmitter Operation:** When power is first applied to the transmitter, it checks for and displays the software version. It then checks the position of the switches and stores their position in memory. The transmitter looks for the GPS time signal. Once the transmitter has received the GPS time, it sets its internal clock to that time. The transmitter then starts to transmit its internal time once every second. The transmitter updates its internal clock every time it receives valid time data from the GPS.

### Analog Clock Operation:

**Insert batteries:** Follow set up procedures detailed in manufacturer's instructions.

After initial setup, the clock will shut off the receiver. Six times each day, the microprocessor will activate the receiver and starting with the stored channel, it will again look for a valid time signal. If necessary, the clocks will resynchronize to the correct time.

If the clock has not decoded a valid time signal for a pre-determined number of days, it will go to a step mode.

## EQUIPMENT

### General

The clock system shall include a transmitter, a roof or window mounted GPS receiver, indicating clocks, and all accessories for complete operation.

### GPS Receiver

GPS roof mounted, with 10 foot cable (3m) attached Wireless extension cable available: 200 ft.

The GPS Receiver shall be a complete GPS receiver including antenna in a waterproof case, designed for roof or outdoor mounting. Provide mounting bracket for attachment to roof structure.

The GPS Receiver cable must be plenum rated where required by local code.

### Transmitter

Consisting of wireless transmitter with GPS receiver, a surge suppressor/battery backup, and a mounting shelf. Unit shall obtain current atomic time from satellite. The clock system shall transmit time continuously to all clocks in the system.

### Transmission:

Frequency Range: 72.100 to 72.400 MHz.

Transmission Power: 1 watt (30dBm) maximum

Radio technology: narrowband FM

Number of channels: 16

Channel bandwidth: 20 kHz maximum

Transition mode: one-way communication

Data rate: 2 KBps

Operating range: 32°F to 158°F (0°C. to 70°C).

### Transmitter:

Transmitter output power: +26 to +30 dBm

Frequency deviation: +/- 4 kHz

Transmitter power requirements: 120 VAC 60 Hz

Internal power requirements: 5 VDC

Carrier frequency stability: +/- 20 ppm

Transmitter shall have 16 selectable channels to assure interference-free reception.

Transmitter shall have the following switches:

Time zone adjustment switches for all time zones in the world: Eastern, Central, Mountain, Pacific, Alaska, and Hawaii.

Daylight Saving Time bypass switch.

12-hour or 24-hour display.

Transmitter housing shall be black metal case, 16-3/4 inches (424.4mm) by 12 inches (304.8mm) by 1-7/8 inches (46.4mm) in size.

Antenna shall be 46 inches (1168mm) high, commercial type, mounted on top center of transmitter housing. Antenna gain shall be < 2.2 dB. Antenna polarization shall be vertical.

Transmitter housing shall incorporate a display which shall include the following:

Time readout AM and PM indicator if 12-hour time display is set Day and date readout

Indicator for daylight savings or standard time LED which shall flash red in event of reception problem GPS reception indicator.

Transmitter shall contain an internal clock such that failure of reception from the GPS will not disable the operation of the clocks.

Power supply (included):

Input: 120 volt AC 50/60 Hz, 0.4 amps.

Output: 9 volt DC, 1.5 amps.

Surge Protector/Battery Backup (included).

Input: 120 volt AC 60 Hz +/- 1 Hz.

Output: 120 volt AC, 500VA, 300 watts

Surge Energy Rating: 365 joules

Additional Equipment:

Wireless Receiver Switches: Switches shall receive time packets from the Primary Transmitter and relay the synchronized time to the Satellite Transmitter connected to it. The unit shall include the following:

Antenna mounted on top of the switch housing, 11-1/2 inches (292mm) long.

Power Supply:

Input: 120 VAC 50/60 Hz, 0.4 amps

Output: 9 volt DC, 1.5 amps

RS 232 data cable, 5 feet (1.5mm) long

Daylight Savings Time bypass switch

Dimensions: 4-1/4 inches (108mm) long, 5-3/4 inches (146mm) wide, 1-1/4 inches (31.75mm) deep.

Weight: 12 ounces (.34kg)

Operating Range: 32°F to 158°F  
(0° to 70°C)

Satellite Transmitters shall receive the signal from the Wireless Receiver Switches and transmit the signal to the devices in its vicinity, which are out of the range from the Master Transmitter. The unit shall include the following:

Antenna mounted on top of the housing, 46 inches (1168mm) long.

Wireless Receiver Switch  
Power Supply

Input: 120 VAC, 50/60 Hz, 0.4 amps  
Output: 9 volt DC, 1.5 amps.

6 foot (1.83m) cord

Surge Suppressor/Battery Backup

Mounting Shelf.

Transmission Power: 1 watt maximum

72 MHz frequency.

Traditional analog clocks (battery): Analog clocks shall be wall mounted. Clocks shall have polycarbonate frame and polycarbonate lens. Face shall be white. Hour and minute hands shall be black.

12-1/2 inch (317.5mm) diameter analog clock:

Additional colors, finishes, and dial faces are available from manufacturer.  
Analog clocks shall be battery-operated, and shall have minimum 5-year battery life.

Analog clocks shall be capable of automatically adjusting for Daylight Saving Time. An on-off switch located on the transmitter shall disable this function if desired.

Time shall be automatically updated from the transmitter 6 times per day.

9 inch (228.6mm) and 12.5 inch (317.5mm) analog clocks shall have a tamper proof/theft resistant clock lock mounting slots.

Analog clock receivers shall be as follows:  
Receiver sensitivity: >-110 dBm

Receiver power: 120 VAC 60 Hz  
Antenna type: internal  
Antenna gain: -7 dBd

If the transmitter stops transmitting valid time signals due to power failure, the clocks will continue to function as accurate quartz clocks until a valid time signal is decoded. If signal transmission is not restored after 48 hours, the second hand will “five step” as a visual indicator that the signal has been lost. Should the clocks lose power and signal, the clocks will not function.

#### Traditional analog clocks (AC)

Analog clocks shall be wall mounted. Clocks shall have polycarbonate frame and polycarbonate lens. Face shall be white. Hour and minute hands shall be black.

#### Cable Connection Sealant

Radio Shack Coaxial Cable Connector Sealant 278-1645, or approved electrical grade silicone sealant.

### PART 3 - EXECUTION

#### EXAMINATION

Verify that construction is complete in spaces to receive equipment and that rooms are clean and dry.

Verify that 120 volt electrical outlet is located within 6 feet (1.83m) of location of transmitter and the outlet is operational and properly grounded.

#### INSTALLATION

GPS Unit: Install on roof in location indicated, in clear view of the sky. Install unit in location free from standing water, and above accumulations of leaves or debris. Seal cable connection to GPS with cable connection sealant. Any added cable lengths must be protected from outside elements.

#### Transmitter:

Locate transmitter where indicated, a minimum of 2 to 3 feet (.6 to 1 meter) above the floor, away from large metal objects such as filing cabinets, lockers or metal framed walls. Transmitter(s) will be placed at locations per plans.

Attach receiver to transmitter using cable.

Connect antenna to transmitter, using care not to strip threads.

Connect power supply to the transmitter.

Set the channel number on the display to correspond to the FCC license.

Plug power supply into electrical outlet.

#### Analog clocks (120V)

Perform the following operations with each clock:

Set clock to correct time in accordance with manufacturer's instructions.

Observe analog clock until valid signals are received and analog clock adjusts itself to correct time.

Install the analog clock on the wall in the indicated location, plumb, level and tight against the wall. If using 12-1/2 inch (317.5mm) clock, attach using clock-lock hanging method and suitable fasteners as approved by clock manufacturer.

### ADJUSTING

Prior to final acceptance, inspect each clock, adjust as required, and replace parts which are found defective.

### CLEANING

Prior to final acceptance, clean exposed surfaces of clocks, using cleaning methods recommended by clock manufacturer. Remove temporary labels from clock faces. Do not remove labels from backs of clocks.

### DEMONSTRATION

Provide training to Owner's representative on setting and adjusting clocks, replacing batteries and routine maintenance.

### PROTECTION

Protect finished installation until final acceptance of the project.

### TESTING

All devices must be tested at their operational location under normal operational conditions to assure reception of signal.

END OF SECTION 16730

## SECTION 16820 - INTERCOM/SOUND

### PART 1 - GENERAL

#### GENERAL

Furnish and install a microprocessor controlled voice communication system with all conduit, wire, outlets and equipment as herein specified to provide a complete sound and voice communication system in the building(s). The main system is existing as indicated on the plans. Additional systems are to be provided and installed and be programmed and interfaced with the existing unit such that the system functions as a whole.

All material and/or equipment necessary for the proper operation of the system, even though not specifically mentioned in the contract documents, shall be deemed part of this contract.

All equipment shall be installed and connected in strict accordance with the manufacturers recommended instructions.

Equipment shall be listed by Underwriter's Laboratories, Inc.

All equipment shall be installed by a Factory Authorized Distributor of equipment specified herein. The installing contractor must have a minimum of five years experience in the specific application of the equipment proposed for this system. The owner shall be furnished with three brochures that provide written operating instructions for the system, wiring diagrams and maintenance notes. The system shall be guaranteed for a period of one year from date of final acceptance.

Submit with quotation a copy of factory authorized franchise of the equipment proposed.

The vendor shall show satisfactory evidence that he maintains a service organization capable of furnishing adequate service to the equipment provided and shall be prepared to offer a service contract for the service of the equipment after the guarantee period. Service shop shall be within one (1) hour driving time of the project site. Sub-letting of service shall disqualify vendor.

The contractor shall have equipment installed on the AC voltage supply taking care to arrest damaging electrical transient and spikes which can cause damage to the microprocessor components of the system. Central office telephone lines shall have equipment installed to arrest high voltages from electrical and/or lightning from entering the system and causing damage. The system shall incorporate Transient Voltage Surge Suppression Technology at all input and output signal (data, voice, signal, etc.) terminations. For sites with multiple buildings, SPD devices shall be incorporated at the input and output terminations of each building.

The specified equipment shall be supplied, installed, adjusted, tested and guaranteed by a factory authorized communications contractor for the products furnished. The

vendor is responsible for verifying the completeness of the parts list and the suitability of the equipment to meet the intended purpose of the specifications and drawings.

The vendor shall provide the following documentation and service:

Shop Drawings. These drawings shall include the manufacturer's specification sheets, including all the component parts.

As-Built Drawings. These drawings shall include the information above. They should include up-to-date drawings that include any changes made to the system during installation. Circuit diagrams and other information necessary for the proper operation and maintenance of the system shall be included.

Operating Instructions: These instructions are to be permanently affixed to all administrative control stations.

In Service Training: Provide the owner with a training program designed to make all administrative control stations users familiar with the operation of the voice communication system. A minimum of one (1) 4 hour session.

The contractor shall warrant the equipment to be new and free from defects in material and workmanship, and will within one year from the date of installation, repair or replace all or any part of the equipment found to be defective. This warranty shall not apply if damage is caused by abuse, accident, improper operation, or negligence. Warranty maintenance shall be provided by the contractor during his normal working hours at no expense to the owner.

## PART 2 - PRODUCTS

### SYSTEM DESCRIPTION

The system shall consist of a central equipment cabinet, microprocessor control unit, power supply, zone modules, administrative control centers (ACC's), amplifiers, remote display units, classroom loudspeaker assemblies, call-in switches, and all associated material, hardware, wiring, and options as described herein to provide a complete working system which shall meet the specified requirements:

The system shall provide the following communication paths and functions:

ACC to a single classroom loudspeaker.

Administrative control center to administrative control center.

Simultaneous program distribution directed from any ACC without interrupting the intercom channel.

Remote cordless phone to a single classroom or to outside horns. The system shall be designed so as to accomplish any combination or all of the above functions simultaneously.

The system shall provide the facilities for:

Paging



Sounding emergency signals

Timed event signals

Control and distribution of one program channel to individual classrooms, selected groups, or all classroom speakers.

The system shall include the facilities for a master clock and programmer. The system master clock will be capable of correcting compatible brands of analog or digital or both types of secondary clocks.

The system shall have an RS232 port for down load/up load capability. Provide owner with a diskette containing their bell schedule, architectural room number information, zone assignments for paging, and bell schedule. Information shall be loaded and unloaded from a standard P.C.

Provide off-site diagnostic capability through RS232 port. Use of programming mode shall not inhibit system operation.

### SYSTEM FUNCTION

The system shall provide a minimum of two intercom channels.

Provide microprocessor-based equipment of modular design, utilizing plug-In connections between all modules.

Facilities to originate emergency calls which take precedence over all routine calls.

System check with self diagnostics.

System to support up to twelve ACC's each having identical functions and control features.

Automatic gain control on intercom speech channel.

Built-in battery backup for internal system clock to maintain correct time for a period of 7 days after power loss. All other programmed data shall be stored in non-volatile EEPROM memory and will be retained indefinitely.

Automatic pre-announce tone over any loudspeaker selected for two-way communications. A privacy tone will sound whenever a loudspeaker is being monitored.

Distribution of paging announcements via any ACC.

Classroom loudspeakers are user programmable to any of eight paging zones or class change zones.

Unique system tones for emergency and civil emergency

Special tone for custodial call to all speakers.

Programmable tones such as warble, siren, chime, etc. six separate items available.

Two way intercom communication from each speaker location.

Last number redial.

Speed dial access to specific remote stations.

Clear all calls registered on the ACC queue.

Scroll waiting calls and select calls to be answered in any order.

Call waiting indication: Steady display for normal calls; flashing display for emergency calls in order of priority.

Call-in reminder in which unanswered calls will repeat until answered.

LCD display for current call/calls waiting. Current time is displayed when the ACC is in an idle state.

Provide one VOX handset (for private communications), built-in microphone, speaker, and push-to-talk button on each ACC for intercom communications.

Sequential review of all incoming calls/calls waiting at each ACC with 100% call retention.

Manual time tones which can be initiate by any ACC.

The system shall be zoned as follows:

Each classroom shall be considered one zone and shall have a dedicated audio circuit to the central equipment cabinet.

All corridor speakers will be on one zone.

All outside horns will be on one zone.

Capability for any ACC to direct a program to any one, group of, or all remote stations.

Self diagnostics for each ACC.

Easy menu-driven programming

Programmable system functions, including:

Five call-in priority levels.

Two, Three, or four digit alphanumeric dialing.

Twelve hour or twenty-four hour clock display when ACC is in the idle state.

Two hundred and fifty -six events, eight time schedules, eight zones, and eight user-programmable tones.

Each classroom shall be programmed to annunciate at any one or all ACC'S.

Automatic distribution of user programmable time signals activated by an internal time clock.

Program room stations, zones, or multiple zones to receive the program source on a selected basis.

The system shall not require motor driven fans to keep system components cool.

Outside horns shall be activated for emergency announcements and tones only. Routine announcements and class change tones shall not go out over the outside horns.

Simultaneous program distribution and two intercom channels.

Compatible with remote display units for display of incoming calls and activity within the system.

System is to be compatible with a DTMF phone system and be able to use touch-tone phones to make and receive call from within the system.

System is to have a user-programmable, battery-backed master clock.

System is to be able to drive either digital or analog clocks or both from within the system.

System capacity shall be up to 256 remote stations and/or call points with up to twelve administration control units [ACC4's], up to 12 remote display units and unlimited interconnection to a phone system.

The system is to have user programmable input ports that allow external devices to trigger time and emergency tones, external all-call, door monitor, night transfer switch, and other system functions. User programmable dry contact outputs are provided to signal external devices when such functions as clock synchronization, all call, and remote annunciations occur.

System is to have an RS-232 Port for P.C.

### SYSTEM MASTER CLOCK

The system shall contain an integral master clock and programmer which shall be capable of performing the following functions:

Displaying the time of day in either twelve or twenty-four hour format at each Administrative Control.

Providing 256 discrete time event entries for programming functions based on;

The time of day in hours and minutes:

The day or combination of seven {7} days of the week the event is to occur.

Selection of any one or any combination of eight {8} zones or outputs to be activated.

Selection of any one of eight schedules to allow for maximum flexibility due to special circumstances or seasonal changes. Selection of fourteen user programmable tones. Provide for an editing and review routine to permit the user to change and edit time events, zones, and schedules.

### ADMINISTRATIVE CONTROL CENTER [ACC]

The administrative control center {ACC} shall be the control center for communications, paging, program distribution and signaling. The ACC will provide the following:

Listening level control for intercom channel or program channel.

Automatic gain control on intercom microphones.

Provide one VOX handset {for private communications}, built-in microphone, speaker, and push-to-talk button on each ACC for intercom communications.  
ACC self Diagnostics.

Provide ACC-keypad, menu-driven programmable systems functions, including:  
Architectural alphanumeric room numbers with option to program call-in registering only at specific ACC's.

Room Call-in priority levels.

Twelve or twenty-four hour time clock.

Two-hundred-fifty-six event, eight time schedules, eight zones.

Eight (8) speaker paging zones.

System tone characteristics.

Eight (8) Speaker program zone assignment.

Eight (8) Speaker time tone zone.

Provide access code for user-restricted entry to system programming functions.

Facility for emergency calls to take precedence over routine calls.

Distinct call-in alert tone for emergency call-in.

Provide distribution of special tone to all speakers for custodial call.

Provide built-in speaker at ACC to monitor program channel.

System programming may be accomplished from an ACC or from a P.C. type computer.

Each ACC shall have an LCD display.

### CENTRAL EQUIPMENT

The central equipment shall be rack mounted in a standard cabinet. The central cabinet shall contain the following equipment:

Trunk or Digital card.  
Analog card.  
Zone switching card as required to accommodate system capacity.  
Power supply as required

System Amplifier(s) {125 watts minimum}

The unit shall require 110 VAC power but in the event of a power failure, the system shall switch over to a standby battery backup system provided by this contractor.

New units shall interface with the existing unit and provide adequate number of zones to meet specifications plus 10% spare.

#### Emergency Tone Generator

Provide seven distinct tones. Tones shall be activated by emergency push button panel specified below.

Emergency Tone shall go over outside horns.

Emergency tones shall be distributed to all speakers

Emergency tone generator included with the system.

#### ADMINISTRATIVE CONTROL CENTER (ACC)

The administrative control center shall be a desk top unit located as shown on the plans. It shall have a modular jack for quick disconnect for servicing.

The administrative control centers shall be a DUKANE ACC4, MCDS3, or Simplex 5120-9921.

#### AM-FM TUNER/CASSETTE PLAYER

The AM-FM Cassette Player shall be Dukane Model RTC350P, Bogen CR-100, or Simplex 5120-9197 including an AM/FM antenna. The Antenna shall be mounted outdoors. It shall have a microphone input and be suitable for mounting in a standard 19" free standing equipment rack. Power for the AM/FM tuner/cassette player shall come from the central enclosure.

#### AM-FM CD PLAYER

The AM-FM CD Player shall be Dukane Model Rauland MCX350, or Bogen CDC-3, or Simplex 5120-9197 including an AM/FM antenna. The Antenna shall be mounted outdoors. It shall have a microphone input and be suitable for mounting in a standard 19" free standing equipment rack. Power for the AM/FM CD Player shall come from the central enclosure.

## CALL-IN SWITCH

The call-in switch shall be the Dukane Model PCS499, Bogen CA-21 or Simplex 5120 9320 Call-In Switch with Privacy. The call-in switch shall use one, three-position rocker switch secured to a brushed stainless-steel wall plate for mounting to a standard single-gang electrical box. The switch shall provide for selecting privacy or normal operation in intercom-type sound systems. The switch shall have spring return closure in the CALL position for placing calls from a speaker location. The switch used shall provide momentary contact in the CALL position, maintained contact in the PVCY position. One button shall be capable of both normal and emergency call-in. A normal call-in becomes an emergency call-in when the CALL position is held and switch contact maintained for 3 seconds. External connections shall be to screw terminals. The switch shall bear PVCY and CALL designations in non-removable, hot-stamped lettering. The dimensions of the call-in switch shall not exceed 4-1/2 inches high, 2-3/4 inches wide and 1-3/16 inches deep.

## WEATHERPROOF HORN

The outside speaker shall be Dukane Model 5A30, Bogen SPT-15-A or Simplex 5120-9583 Re-entrant type and shall be furnished and installed as indicated on the drawings. Each unit shall have a power rating of 15 watts full range. The frequency range shall be 275 to 14,000 Hz. The trumpet shall have a screwdriver adjustable switch that can be set externally to select 15, 8.0, 4.0, 2.0, 1.0 watts on a 70-volt line or 15, 13, 7.5, 7.0, 3.7, 2.0, 1.8, 1.0, 0.5 watts on a 25-volt line. Available impedances shall be 5000, 2500, 1250, 625, 325, 90 or 45 ohms. The sound pressure level shall be 121 dB at 4 feet on axis with 15 watts input and 110 degrees dispersion. The horn shall be 8" wide, 8" high, and 9" deep. It shall be fabricated from beige high impact ABS type plastic. External connections shall be screw terminals. The Terminal housing and transparent cover shall function together as a strain relief. The horn shall be provided with a three-way adjustable mounting bracket.

## FLUSH CEILING LOUDSPEAKER SPEAKER ASSEMBLY

The loudspeaker shall be Dukane Model 5A606, Bogen S86 or Simplex 5120-9481 furnished and installed as indicated on the plans. The loudspeaker shall be eight inch, seamless cone type. The ceramic magnet shall weigh at least 4.8 ounces. The frequency range shall be from 90 to 15,000 Hz. The normal wattage rating shall be 8 watts with a program rating of 12 watts. The voice coil diameter shall be 3/4" and the impedance 8 ohms.

The overall speaker diameter shall be 8-1/32 inches, and the speaker depth shall be 2-3/4 inches. The weight shall be 1 pound, 14 ounces. All external parts shall be cadmium plated and conform to EIA standard. The loudspeaker shall be equipped with a universal matching transformer suitable for use on a 25-volt output line with taps at 1/2, 1 or 2 watts or a 70-volt output line with taps at 1/2, 1, 2 or 4 watts.

The Flush Ceiling Baffles shall be Dukane Model 6A338, Bogen WB8, or Simplex 5120-9421. The baffle shall be 12-5/8" in diameter, and the circular design shall match the surrounding motif. It shall be solid white, molded, high impact styrene, highly resistant

to scratches and mars. The baffle finish shall accept any good latex paint to match the mounting surface where required. It shall mount an 8-inch loudspeaker with concealed screws and provide a 60% opening for the sound. The baffle weight shall not exceed 7.5 ounces.

The Speaker Backbox shall be Dukane Model 8A300, Bogen RE84, or Simplex 5120-9491. The enclosure shall have four 8-32 J nuts installed in the mounting flange. The backbox shall have four combination knockouts 1/2" – 3/4" spaced 90 degree apart. The backbox shall have a durable finish and shall use a Visco/elastic damping compound. It shall have a 9" diameter by 3/8" thick polyester urbane acoustic foam pad applied to the inside bottom to prevent mechanical and acoustical resonances.

The Speaker Support Bridge shall be Dukane Model 677-67, Bogen TB8, or Simplex 5120-9499. The speaker support bridge shall be made of steel and finished with a durable protective coating. The speaker support bridge shall be 14-1/2" high and 23-3/4" wide and weigh 1-1/2 pounds.

### INTERCOM ROOM STATION

The Dukane 4A1480, Bogen or Simplex 5120-9610 Intercom Station with Call-in Switch shall be flush-mounted and shall consist of a water and flame resistant speaker/microphone with Mylar cone and momentary call-in switch. The speaker/microphone and momentary call-in switch shall be mounted to a heavy-gauge, stainless steel faceplate, which in turn shall mount to a standard three-gang masonry backbox. The speaker/microphone cone shall be protected from flame or liquids by five barriers. Three of these barriers shall be metal plates with strategically positioned holes for speaker cone protection. The fourth barrier shall be perforated vinyl and shall be placed behind the other three barriers but in front of the speaker cone. The Mylar speaker cone shall provide a fifth barrier that is moisture proof.

### PART 3 - EXECUTION

#### CABLE

Cable and wire as recommended by manufacturer.

END OF SECTION 16820

## SECTION 16950 - COMMUNICATIONS

### PART 1 - GENERAL

#### RELATED DOCUMENTS

The General and/or Special Conditions Sections are a part of this specification and the Contractor shall consult them in detail for instructions pertaining to this work.

#### SCOPE

Furnishing of all labor, material, equipment, supplies, and services necessary to construct and install the complete communications systems as shown on the drawings and specified herein. Contractor shall report any discrepancies pertaining to this project scope between the plans given and the existing building. All work pertaining to cutover, removal of electronics and any other items indicated on plans shall be coordinated with Baldwin County Board of Education IT dept. Work shall include but is not necessarily limited to the following items:

Data  
Telephone

Contractor shall be solely responsible for quality control and shall maintain quality control over supervision, subcontractors, suppliers, manufacturers, products, services, workmanship, safety, temporary facilities, and site conditions, to produce Work in accordance with Contract Documents.

Work shall be free from faults and defects in workmanship. Materials and equipment incorporated into the work shall be new, unless noted otherwise.

Required testing and inspection are intended to assist in determination of probable compliance of the work with the Contract Documents, but do not relieve Contractor of responsibility for this compliance. Specified testing and inspection are not intended to limit Contractor's quality control program.

#### CONTRACTOR QUALIFICATIONS

The Structured Cabling System Contractor (SCSC) shall be an experienced firm regularly engaged in the layout and installation of structured cabling systems of similar size and complexity as required for this installation. The Structured Cabling System Contractor, under the same company name, shall have successfully completed the layout, installation, testing and warranty of not less than five Structured Cabling Systems of the scope of the largest system on this project for a minimum period of three years prior to the bid date, and shall have been regularly engaged in the business of Structured Cabling Systems contracting continuously since. The Contractor shall have an existing permanent office located within 100 miles of the job site from which installation and warranty service operations will be performed.



The contractor shall be a certified contractor by the structured cabling system (SCS) manufacturer and shall be in good standing. The contractor shall provide certificates of said certifications if required. In addition, the RCDD/ Project manager and not less than 50% of the installing technicians shall be BICSI certified installers and/or manufacturer certified. The contractor shall assure that all requirements of the warranty of this project can be met by the manufacturer and the contractors subsequent certification from the SCS manufacturer.

The head Installer assigned for the project shall be a BICSI registered Level II installer.

The Structured Cabling System Contractor shall present, with his signed contract, the name and certification number of a BICSI certified Registered Communications Distribution Designer (RCDD) who is a permanent employee of the Contractor. **Contract RCDD's shall not be acceptable.** The Contractor shall maintain this RCDD, or another RCDD approved by the Engineer, in his permanent employment throughout this project. The RCDD shall have overall responsibility for certifying that the installed structured cabling system conforms to these contract documents and to the referenced EIA/TIA, IEEE, BICSI, and UL standards. Specific requirements for the RCDD are as follows:

The RCDD shall be, in the judgment of the Engineer, thoroughly experienced in the design, layout, and installation of structured cabling systems of similar size and complexity as required for this installation. The RCDD shall submit evidence of these qualifications to the Engineer upon request.

The RCDD shall affix his stamp to the Contractor's pre-installation submittal drawings, indicating that he has reviewed and approved the drawings for conformance to the contract documents and to the referenced codes and standards.

The RCDD shall periodically visit the site and inspect the work in progress. RCDD site visits shall be made not less than once per month when the job is in active progress. The RCDD shall prepare a field report for each site visit for submission to the Engineer.

The RCDD shall sign off on all copper and fiber optic cable test results, indicating that he was in responsible charge of all cable testing procedures and that all cables were tested in compliance with the contract documents and met or exceeded the requirements stated therein.

The RCDD shall affix his stamp to the Contractor's as-built drawings, indicating that he has reviewed and approved the drawings as being complete, accurate, and representative of the system as actually installed.

The RCDD shall be present for and participate in not less than four hours of user training.

#### CONTRACTOR QUALIFICATIONS – CONDUIT INSTALLATION:

All conduit shall be installed by a licensed electrical contractor using tradesmen who are skilled and experienced in the types of conduit installations indicated in the bid

documents.

## BID REQUIREMENTS

The Structured Cabling System Contractor shall provide the following documentation, to be presented with the bid, as evidence that the requirements for Structured Cabling System Contractor qualifications listed above are satisfied. If the bidder does not meet the requirements of this specification section for structured cabling system work, he shall provide the following documentation, to be presented with the bid, as evidence that the requirements listed above are satisfied by the Structured Cabling System Contractor he proposes to use as a subcontractor to perform work under this section. In either case, all work under this section shall be performed by permanent employees of the Structured Cabling System Contractor listed on the bid form, and shall not be performed by another subcontractor, employees of another company, or by temporary employees.

A list of not less than five (5) references for jobs of similar size and complexity including project name, location, contact person and phone number. These projects shall all be performed in K-12 schools while school was in session.

RCDD name, BICSI certification number, and qualifications.

Location of office from which installation and warranty work will be performed.

## ADDITIONAL MATERIAL REQUIREMENTS

In addition to the contract documents, the structured cabling contractor shall provide additional parts/materials for additional services and unforeseen conditions and additions. These additional materials shall include all labor to install and test per these specifications. These additional requirements shall include:

25 data cables and outlets ports, including faceplates, cable, patch panels (if needed) in locations to be determined under construction. Assume cables to be approximately 75' in length and terminated on nearest consolidation point or patch panel. These shall include all cable pathway requirements.

Four installations of data surge protection (as specified on drawings), including grounding conductor and enclosure.

These additional materials shall be used to replace existing damaged cables or newly added outlets. These items shall only be installed when approved by the Owner and engineer.

Effort has been made to identify/locate all existing outlets on the drawings. It is anticipated that 10% of the outlets in the building have not been identified. Contractor shall locate these outlets when found and provide with new cabling, jacks, faceplates, labeling etc., and test as required by the plans and specifications. *The quantity of additional, new outlets listed above are not included in these 10% of existing outlets that were not identified on the drawings.*

## RELATED REQUIREMENTS

The contractor shall understand and apply the Baldwin County Board of Education telecommunications infrastructure standard to their installation. Any discrepancies between these specifications and the design drawings from these standards shall be noted and expressed to the Owner and engineer for a decision and direction.

Division 16 Specification Sections regarding conduit and raceway apply to work under this section, with the additions and modifications specified herein and on the drawings. The special requirements indicated on the drawings for structured cabling system conduit shall take precedence over any requirements specified in Division 16 Specification Sections.

## EXAMINATION OF SITES AND TOTAL SYSTEM RESPONSIBILITY

Prior to providing a proposal for this work, the Contractor shall visit the proposed sites of work to become familiar with any condition that may in any manner affect the work to be performed. No allowances shall be made because of lack of knowledge of these conditions.

The Contractor shall have total system responsibility to assure a fully operational system. Any additional labor and components required for the installation of a complete operating system but not specifically required by the bid documents shall be provided and the cost borne by the Contractor.

The Contractor remains the owner of all components provided under this contract and is responsible for all risk of loss or damage to all components up to and including the date and time of Final Acceptance by the Engineer and the Owner's Authorized Representative. After the date of Final Acceptance, the Owner shall assume full ownership of the equipment.

## JOB CONDITIONS

Existing Conditions: All existing systems, and conditions shown on the plans as existing are approximate, and the Contractor shall verify all details of the project before any work is started.

Scheduled Interruptions: Planned interruptions of telephone/data/, to any facility affected by this contract, shall be carefully coordinated and approved by the Architect at least ten (10) days in advance of the requested interruption. The Contractor shall not interrupt services until specific approval has been granted by the Architect. The request shall indicate services to be affected, date and time of interruption and duration of outage. Request for interruption of service will not be approved until all equipment and material required for the completion of that particular phase of work are on the job site. The work may have to be scheduled after normal working hours.

Maintaining Service: Any existing service (or operating system) which must be interrupted for any length of time shall be supplied with a temporary service as necessary for continuation of the normal operation of this facility.

Removal of Existing Work: Where noted or indicated on the drawings, or specified herein, existing electrical materials and equipment shall be removed from the building. All materials designated to be removed by the Contractor, not to be salvaged and given to the Owner or required to be reinstalled, including scrap, shall become the property of the Contractor, and shall be promptly removed from the site. Existing items required to be removed temporarily in order to properly install new work shall be replaced in a satisfactory manner upon completion.

## CODES, PERMITS AND INSPECTIONS

Minimally, the following standards must be met when applicable to the work performed:

International Standards Organization/International Electrotechnical Commission (ISO/IEC)  
DIS 11801

Underwriters Laboratories (UL) Cable Certification and Follow up Program.

ANSI/TIA/EIA-568-B.1 -- *Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements*

ANSI/TIA/EIA-568-B.2-1 -- *Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components*

ANSI/TIA/EIA-568-B.3 -- Optical Fiber Cabling Components Standard

ANSI/TIA/EIA-569-A -- Commercial Building Standard for Telecommunications Pathways and Spaces

ANSI/TIA/EIA-606(A) -- The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings

ANSI/TIA/EIA-607(A) -- Commercial Building Grounding and Bonding Requirements for Telecommunications

ANSI/TIA/EIA-526-7 -- Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant

ANSI/TIA/EIA-526-14A -- *Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant*

ANSI/TIA/EIA-758(A) -- *Customer-Owned Outside Plant Telecommunications Cabling Standard*

AHJ -- Local Authority Having Jurisdiction (AHJ)

NEC -- National Electrical code

NFPA -- National Fire Protection Association

NESC -- National Electrical Safety Code

BICSI -- BICSI Telecommunications Distribution Methods Manual (TDMM)

The installation shall comply with all local, state, and federal laws and ordinances applicable to communication equipment installation and with the regulations of the latest published edition of the National Electrical Code (N.E.C.) and the Federal Communications Commission (FCC) where such regulations do not conflict with those laws and ordinances. The Contractor shall obtain and pay for all permits and inspection fees, and after completion of the work, shall furnish the Architect a certificate of final inspection and compliance with the standards listed above as applicable. Any charges by a utility (Data, Telephone, etc.) for providing service as shown shall be included in the bid and paid by the Contractor.

## JOB-SITE CONDITIONS

The Contractor shall be required to coordinate working hours at each site with the School Principal. Work at the site shall not be allowed during hours when school is in session, unless specifically approved by the School Principal on a day-by-day and case-by-case basis. The Contractor shall work at night and/or weekends (or at any time school is not in session) to meet these requirements at no additional charge to the Owner.

The Contractor shall be responsible for ensuring that his employees and any subcontractors:

Refrain from smoking or the use of tobacco in any facility, property or vehicles owned by the School District. Any person wishing to use tobacco products must leave School District property to do so.

Refrain from the use of vulgarities while on School District property.

Wear proper attire to include full length pants or jeans and appropriate shirts. Clothing shall have no vulgarities or sexually suggestive graphics. Clothing shall bear contractor's company name.

Refrain from contact with students or staff. Communications with staff shall be limited to that related to the work.

The School District retains the right to require the Contractor to dismiss any employee or any employee of his subcontractors deemed incompetent, careless, insubordinate or otherwise objectionable, or any personnel whose actions are deemed to be contrary to the public interest or inconsistent with the best interest of the School District.

The Contractor shall be responsible for all damages to any building, equipment, furnishings, or other property of the School District that are caused by the Contractor or his subcontractors. The Contractor shall, as directed by the Engineer or the Owner's Authorized Representative, repair or replace any damaged item at the Contractor's expense. Any item which the Engineer or the Owner's Authorized Representative allow to be repaired shall be restored to the condition which existed prior to the damage occurring, or better.

## PRE-INSTALLATION WALK-THRU

Contractor shall schedule a walk-thru with principal and school district IT representative. The purpose of the walk-thru will be to identify any damage that exists prior to installation and potential conflicts/discrepancies with the design documents. All issues shall be documented and signed off by the principal and school district IT representative.

## PRE-CONSTRUCTION CONFERENCE

Contractor shall schedule a pre-construction conference with principal, school district IT

representative and engineer. Contractor shall present any issues/discrepancies from pre-installation walk-thru, schedule of construction including start date and completion date, scheduled progress meetings, anticipated daily work schedule and any required scheduling with principal, school IT representative and engineer.

## DRAWINGS AND SPECIFICATIONS

The drawings and these specifications are complimentary each to the other. What is called for by one shall be as binding as if called for by both. Where the drawings and/or specifications differ as to quantity or quality, the greater quantity or higher quality shall be provided. Omissions from the drawings and specifications of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such work. In any case of discrepancy in the figures or catalog numbers, the matter shall be submitted to the Architect, who shall promptly make a determination in writing. Any adjustment by the Contractor shall be at the Contractor's own risk and expense. Electrical drawings are diagrammatic only. Do not scale these drawings. All equipment shall be installed in accordance with manufacturer's recommendations and any conflicting data shall be verified before bidding.

## STANDARDS OF MATERIALS AND WORKMANSHIP

Materials: All materials shall be new and shall be listed and approved by the Underwriters' Laboratories, Inc., in every case where a standard has been established for a particular type of material in question. All work shall be executed in a workmanlike manner and shall present a neat appearance.

Prior Approvals: Equipment and materials of the same type or classification and used for the same purpose, shall be products of the same manufacturer. It is the intention of these specifications to indicate a standard of performance and quality for all materials incorporated in this work. Manufacturer's names and catalog numbers are used to designate the item of equipment or material as a means of establishing grade and quality. Where several manufacturers are named, only those named manufacturers' products will be considered and the Contractor's bid shall be on their products. The first named of several manufacturers is the manufacturer whose product was used in engineering the project. Other named manufacturers, although acceptable as manufacturers, shall guarantee that their product will perform as specified and will meet space requirements. Where performance characteristics of such equipment differs from the equipment scheduled on the drawings, the engineer shall reserve the right to reject it.

For approval of products other than those specified, bidders shall submit to the Architect, a request in writing, at least ten (10) days prior to bid date. Requests received after this time will not be reviewed or considered regardless of cause. Requests shall clearly define and describe the product for which approval is requested. Requests shall be accompanied by manufacturer's literature, specifications, drawings, cuts, performance data, model numbers, list of references or other information necessary to completely describe the item. Approval will be in the form of an Addendum to the specifications issued to all prospective Prime Contract Bidders on

record. The Addendum will indicate the additional products which are approved for this project.

Substitutions: Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of material and equipment required for this installation and is not intended to exclude products equal in quality and similar design. The Architect reserves the sole right to decide the equality of materials proposed for use in lieu of these specified. It shall be the Contractor's responsibility to furnish the information and data sufficient to establish the quality and utility of the items in question, including furnishing samples if required.

Shop Drawings: The Contractor shall submit a list of items proposed for use. He shall also submit catalog data and shop drawings on proposed systems and their components, panelboards, safety switches, starters and contactors, transformers, lighting fixtures, and wiring devices. Where substitutions alter the design or space requirements, the Contractor shall defray all items of cost for the revised design and construction including costs to all allied trades involved. Data shall be submitted within ten (10) calendar days after the contract is awarded. Provide six (6) copies of shop drawings unless a greater number of copies is required by the General Conditions. Each submittal data section shall be covered with an index sheet listing Contractor, Sub-Contractor, Project Name, and an index to the enclosed submittals.

Each major section of submittals such as power, equipment, lighting equipment, fire alarm, etc., shall be secured in a booklet or stapled with a covering index which lists the following information:

General contractor with phone number and project manager.

Subcontractor with phone number and project manager.

Supplier of equipment with phone number and person responsible for this project.

Index of each item covered in submittal and model number as proposed in the attached.

Any deviation from contract documents shall be specifically noted on submittal cover index and boldly on specific submittal sheet.

Operating and Maintenance Manuals: At completion of the work, furnish three (3) copies of written operation instructions which shall include manufacturer's descriptive bulletins, operating and maintenance manuals and parts lists of all equipment installed. Also include in such instructions, the specified size and capacity ratings of all equipment installed. Each set of instructions shall be assembled into a suitable loose-leaf type binder and presented to the Architect for delivery to the Owner.

Record Drawings: Maintain one extra set of black-line, white print drawings for use as Record drawings. Records shall be kept daily, using colored pencil. As the work is completed, relevant information shall be transferred to a reproducible set, and copies made to be given to the Architect.

## INTERFACE WITH OTHER CONTRACTS

It shall be the responsibility of the Contractor to cooperate with all other crafts working

on this project. All cutting, trenching, backfill, and structural removals to permit entry of the communications system components shall be done by this Contractor. All patching and finishing shall be done by the General Contractor.

## GROUNDING

Provide grounding and bonding systems in strict accordance with the latest published edition of N.E.C., except where more stringent requirements are specified herein. Inter-connection of neutral and ground is not permitted at any point in the communications system. Install grounding conductors to permit shortest and most direct path to ground. Inaccessible joints are not to be made in grounding conductors. Where grounding conductors are in raceway, bond conductor and raceway at both ends. Grounding and bonding fittings used shall be UL listed and be compatible with metals used in system. Sheet metal type straps are not acceptable.

The Equipment Rack shall be connected to the existing ground system that consists of driven electrodes, ground ring, building steel, water pipe electrodes, concrete encased electrode, rod and pipe electrodes, or plate electrodes by a #3/0 conductor. The driven electrodes, building steel, water pipe electrodes, and concrete encased electrodes are the minimum requirements. Extend grounding conductor to main telephone equipment space.

The Contractor shall test and provide written certification of final ground system; including test method, equipment model and serial numbers, and final measurements at each point. The ground electrode system must be less than 25 ohms.

## GUARANTEE AND SERVICE

Upon completion of all tests and acceptance, the Contractor shall furnish the Owner of a written guarantee covering the electrical work done for a period of one (1) year from date of acceptance. Guarantee includes equipment capacity and performance ratings specified without excessive noise levels. Upon notice from the Architect or the Owner, the Contractor shall, during the guarantee period, rectify and replace any defective material or workmanship and repair any damage caused thereby without additional cost.

## PART 2 - PRODUCTS

### GENERAL

All equipment and materials shall have ratings established by the recognized independent agency or laboratory. The Contractor shall apply the items used on the project within the ratings and subject to any stipulations or exceptions established by the independent agency or laboratory. Use of equipment or materials in applications beyond that certified by the agency or beyond that recommended by the manufacturer shall be cause for removal and replacement of such misapplied items. See section 16100 for raceway and junction/pull box requirements.



## CABLES

Data/Communication Cable: Cable shall be Category 5e unshielded twisted pair. The vendor shall determine if plenum or riser rated cable is required for the specific installation.

Cable Pathway: Extension of all data cables shall be within raceway, conduit, cable tray or j-hook cable delivery system provided and installed by the contractor.

Fiber: Fiber shall be 6 strand count multi-mode fiber optic cable.  
Cabling will have a 15 year *manufacturers* warranty on all parts and labor.

All copper cable terminations shall comply with, and be tested to TIA/EIA 568B and TSB-67 standards for Category 5e installations.

All test results shall be compiled and given to the Owner in electronic format.

Cables to be provided by the Contractor:

One 6' patch cord with terminations per data connection point.

One 6' telephone cable with terminations per telephone connection point.

RCA outlet connection cabling as shown on the plans.

Cat-5e cabling and labeled terminations from the Data Equipment Rack to all data connection points.

Cat-5e cabling and labeled terminations from the Telephone Equipment Rack to all Telephone connection points.

All cables and labeled terminations required in the MDF/IDF's to interconnect patch panels, data equipment, fiber optic patch panels, Telephone distribution hub, computers, etc. to provide a fully functional and operational system.

Cables and labeled terminations between all Main Distribution Frames (MDF's) and Intermediate Distribution Frames (IDF's) (existing and new), and between all Cable TV and Telephone distribution backboards/network centers.

## CABLE ROUTING

### Cabling:

All communications cabling used shall comply with the requirements as outlined in the National Electric Code (NEC) article 760 and the appropriate local codes. All cabling shall bear CMP (Plenum Rated), CM/CMR (Riser Rated) markings. All cabling shall be solid copper, 24 AWG, 100 W balanced twisted-pair (UTP) Category 5e cables with four individually twisted pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2-1 up to 1 GHz.

#### Cabling Bundling:

Install horizontal cabling shown to be free-routed parallel and perpendicular to building lines, up high and over piping, ductwork, conduit and other utilities, and in protected locations. All cabling shall be neatly and symmetrically bundled (maximum individual bundle size 25 four pair Category 5e cables), bound with black velcro wraps at a minimum of four feet on center, properly supported, and otherwise installed as indicated on the drawings. Support all free-routed horizontal cabling bundles individually with Category 5e J-hooks (Erico "CABLCAT") at a minimum of four feet on center. Attach J-hooks to building structural members only using factory support system components. Secure cables bundles within J-hooks with factory contact free containment cable ties. Do not attach J-hooks to ceiling grids, ceiling supports, piping, ductwork, conduit or anything other than building structural members unless specifically approved by the Engineer. Do not support free-routed horizontal cabling by running over or directly attaching to building structural members, piping, ductwork, conduit or any other utility.

Do not pull cables in conduits until plastic insulating bushings have been installed. Cables installed in conduits without plastic insulating bushings shall be removed and replaced with new cables. Route conduits together wherever possible.

Provide wire management devices on backboards and racks as indicated and as required to facilitate organized routing of cables and patch cords. Bundle cables together behind racks and fan out to points of termination. The finished installation shall meet the approval of the Engineer for overall quality and neatness of appearance.

The Contractor, in providing a bid, shall be fully responsible for any and all damage to cabling which may occur during the installation, and shall replace any damaged cabling with new cabling of the type specified for the application.

#### Fire Stopping:

Sealing of openings between floors, through rated fire and smoke walls, existing or created by the contractor for cable pass through shall be the responsibility of the contractor. Sealing material and application of this material shall be accomplished in such a manner, which is acceptable to the local fire and building authorities having jurisdiction over this work.

#### Warning Labels:

All fiber optic cable running through crawl spaces, in attics, or above drop ceilings shall be clearly and noticeably marked as fiber optic cable, unless completely covered and protected in conduit. Warning markings must be placed at a minimum of every five (5) feet.

### STRUCTURED CABLING SYSTEM

All drops installed and maintained by vendor must support (but not be limited to) the following application standards: 100Base-T (IEEE 802.3), 1000Base-T (Fast Ethernet), 100VG - AnyLAN (IEEE 802.12), 4/16 Mbps Token Ring (IEEE 802.5), and 52/155Mbps ATM (ATM Forum).

## SYSTEM DESCRIPTION

The system work or projects shall consist of a network of fiber optic, and unshielded twisted pair, riser, tie, patch, and station cables. Cables and terminations shall be provided and located as shown and in the quantities indicated on any drawings, or determined during school walk through. Fiber cables shall terminate on fiber distribution centers (FDC's), fiber patch panels (FPP's), lightguide interconnect unit (LIU's), and/or modular patch panels located in all designated demarcation points. All cables and terminations shall be identified at all locations. All cables shall be terminated in alphanumeric sequence at all termination locations. All copper cable terminations shall comply with, and be tested to TIA/EIA 568B and TSB-67 standards for Category 5e installations. Station cables shall terminate on wall plates equipped as designated by Baldwin County Board of Education (BCBE) personnel.

### Outlets

Outlets for data communication shall consist of two gang utility outlet boxes. Wall plates will be equipped with 8-pin modular (RJ-45) jacks, utilizing T568B wiring. Single-gang mounting plates may have one, two, three, or four openings. The following are the specifications for each type of opening:

Voice Outlet - AMP, Ortronics, or Hitachi 8-pin modular, category 3, unkeyed, black, pinned to T568B Standard.

Data Outlet - AMP, Ortronics, or Hitachi 8-pin modular, category 5e, unkeyed, orange, pinned to T568B Standard.

Optical Fiber Connectors - MTRJ adapter.

All wall boxes, faceplates, track, and all other associated pieces shall be the color of white. Each port shall be clearly marked what type of port it is and the number in which that port associates to in the termination point. All outlet cabling shall terminate on termination patch panels in their associated TC or WC.

### Station Cable

Category 5e UTP, 4 Pair, data cables shall be extended between the station location and its associated TC or WC. These cables shall consist of 4 pair, 24 gauge, UTP, and shall be terminated on the 8-pin modular jacks provided at each outlet. Cable jacket shall comply with Article 800 NEC for use as a plenum cable. The 4 pair UTP cable shall be UL certified.

### Fiber Optic Cabling

Fiber optic cabling shall be provided between MDFs and classrooms, libraries, and other rooms and furnished with the quantity of fibers designated by Baldwin County Board of Education.

### Same Manufacturer

All fiber in a cable run shall be from the same manufacturer and shall be of the same type. A mix of fibers from different manufacturers may not be used without BCBE permission.

### Multimode Fiber Specifications

All fiber optic cables within the premises will use multimode, graded index, fibers with 62.5 micron cores only. Fibers must comply with EIA/TIA 492 specifications and IS 11801 standards. Fibers will have dual-wavelength capability: transmitting at 850nm and 1300nm ranges. All fibers shall be color coded to facilitate individual fiber identification.

### Fan-out Kits

All loose tube cables will be provided with fan-out kits at each termination point.

### Equipment Racks

The TC, TWC, or ER shall be equipped with a floor mounted EIA/TIA standard 19" rack as designated. Provide shelves and wire managers as required by Baldwin County Board of Education. Racks shall be manufactured by Ortronics or approved equal. Provide and install all wire management hardware. Rack wire management is to be vertical and mounted on the sides.

The minimum rack size shall be a standard 19 inch rack with sufficient rack space to allow the fiber distribution center (FDC) to be placed at the top of the rack.

Floor mounted racks shall be secured from the top rail to the backboard in the room with a length of cable runway to prevent movement. All racks shall be grounded to the isolated ground bar within the ER using a standard ground lug and #6 jacketed green cable.

### Patch Panels

Patch panels shall be in 12, 24, 48, and 96 port configurations as designated and be AMP, Ortronics or Hitachi. Patch panels shall be wired for T568B configuration.

Designation strips for each jack shall be provided on the patch panel. All cables shall be terminated in numerical sequence.

### Category 5e Patch Cords

Provide Category 5e Modular Patch Cords for each assigned port on the patch panel. All cords shall conform to the requirements of EIA/TIA 568B Commercial Building Telecommunications Cabling Standard and be part of the UL LAN Certification Follow-up Program. Cords shall be equipped with an eight (8) pin modular connector on each end and shall conform to the length(s) required maintain proper installation and bend radiuses.

### Fiber Patch Panels

Lightguide Interconnect Unit (LIU): LIU is a termination and administration point for the fiber in the network. The LIU will protect the fiber connectors from mechanical stress, macro-bending, and tampering with the circuit. The LIU will provide circuit identification and will be wall-mounted. The LIU shall be manufactured by Siecorm and have connector panels that accommodate ST connectors. The LIU shall provide terminating, cross-connecting or interconnecting capability of 6, 12, or 24 fibers.

### Fiber Patch Panels

Lightguide Distribution Shelves (LDS): LDS is a high fiber-count termination and administration point for the fiber cables in the network. The LDS will provide a place for

circuit identification and be mounted securely at the top of the equipment rack. LDS shall be manufactured by Siecor or approved equal. The LDS shall have connector panels that accommodate ST connectors. The LDS must be mountable in a 19" rack and have front and rear access panels. The LDS shall provide terminating capability of 24, 48, 72, or 144 fibers.

#### Fiber Patch Cords

The fiber patch cords shall consist of a buffered, graded index fiber with 62.5 micron core and a 125 micron cladding for multimode application. The fiber buffer shall be covered by aramid yarn and have a jacket of flame retardant PVC. The connector shall be ST as manufactured by Siecor or approved equal.

#### Multimode Fiber Optic Connector

Provide a field installable multimode connector to terminate fiber optic cables from cable-to-cable, cable-to-equipment or equipment-to-equipment, and make jumpers. The connector must be AMP light crimp, ST, stainless steel.

#### CABLE LADDER

The cable ladder is to be as indicated on the plans with heavy-duty 3/8" steel bar construction. Channel cross slats are to be welded between stringers. Provide and install all associated support hardware, transitions, curves. See the plans for the actual size of the ladder.

A CSD Firststop firestop system is to be provided and installed where fire barriers are penetrated by cable ladders.

#### IDENTIFICATION:

All labels shall be produced using a laser printer and shall be easily readable from floor level when viewing a backboard, panel, or communications outlet from the front.

Labels for communications outlets, horizontal patch panels, and fiber optic drawers shall be made using factory laser printer label sheets furnished by the outlet and block manufacturer. Sheets shall be preformatted with perforated tear-out labels sized for the specific application. Use spreadsheets furnished by the manufacturer to enter data for printing. Handwritten labels are not acceptable. Provide data sheets describing proposed labeling products for cable and conduit with pre-installation submittals.

Label each main cable at each end based on source and destination room numbers using Engineer approved permanent labeling system.

Label each horizontal wiring conduit at the backboard or panel end based on the identification of the CO served using Engineer approved permanent labeling system.

Label each main (backbone) cable at each end based on source telcom room number and destination telcom room number using write-on mylar wrap wire markers.

Label each existing communications outlet to match new labeling scheme as shown on the plans.

Label each communications outlet, horizontal wiring terminal block, backbone wiring terminal block, communications panel, rack, enclosure, and other devices as indicated on the drawings.

### CABLE TESTING

Prior to the installation of patch cords, the Contractor shall test all cables. As part of cable test procedures verify all labeling and correct all inaccurate labeling. Cable testing shall include existing outlets/cables, TC's and new outlets/cables.

The Contractor's RCDD shall be in responsible charge of all cable testing procedures and shall provide a letter to the Engineer at the completion of successful testing certifying that all cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.

The requirement for this project is full compliance/zero tolerance. Cables which do not comply shall be removed and replaced. If certain existing cables do not comply, contractor shall notify engineer and may be deemed (at engineer's discretion) considered part of contractor's required "Additional Materials Requirement" in the specifications and be replaced with new. Partial use of cables by claiming good pairs or strands and abandoning others is not allowable. Defective cables shall be removed.

Tests shall be performed in strict accordance with the test instrument manufacturer's printed instructions.

Technicians performing testing shall be thoroughly trained in the use of the test instruments employed. Factory certification of technicians is desirable. The Contractor shall provide evidence of training if requested by the Engineer.

Test instruments shall be calibrated and traceable to the National Institute of Standards (NIST). Test instruments shall have been recently calibrated. The Contractor shall provide evidence of test instrument calibration if requested by the Engineer.

The Contractor shall be required to retest installed cables in the Engineer's presence to verify the Contractor's test documentation. The percentage of cables to be retested shall be determined by the Engineer based on compliance of the installation with the contract documents, quality of workmanship, and results of initial cable tests. Retesting shall be performed as required until all cables, in the judgment of the Engineer, comply with the requirements of the contract documents.

### Cable Test Manual

Prior to the Substantial Completion Inspection, complete the digital (CD/DVD format) Cable Test Manual. Submit the Cable Test Manual to the Engineer at the Substantial Completion Inspection. Provide transmittal letter addressed to the Engineer indicating that the Contractor is providing one CD/DVD disk containing cable test results.

Quantity: One (1).

Format: *CD/DVD disk with printed label indicating the following:*

Project Name  
Contractor's Name  
Owner's Name  
Owner's Project Number or Purchase Order Number

CD/DVD Contents:

RCDD Certification (PDF format):

Written Certification of Contractor's RCDD, digitally signed, stating that all fiber optic, Category 5e, and multi-pair telephone cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.

### Test Reports

Test reports of all fiber and copper cabling. Provide with software compatible reader, similar to Fluke Networks LinkWare. Refer to test requirements in this section.

### Fiber Optic Cable Testing

Fiber optic cable shall be tested with an OTDR tester.

Notify the Engineer in writing not less than five days prior to commencing fiber optic cable testing. The Engineer may elect to be present for and witness fiber optic cable testing.

Clean all fiber optic connectors, sleeves and test cords prior to testing. Follow all other recommendations of the test instrument manufacturer for cable and instrument preparation.

Record all test conditions and setup parameters and include in a typed discussion to be provided with test documentation. Setup parameters shall include the length of the fiber launch cord.

All fiber optic cable tests shall be performed with a section of launch cord of known length preceding the FUT (fiber under test) and with a section of cord following the FUT. The trace for each test shall clearly display the two-point loss in db, which shall include the loss of the FUT and both mated connectors of the FUT. The operator shall carefully position the first cursor just ahead of the first mated connector of the FUT, and the second cursor just behind the second mated connector of the FUT.

### Post-Installation Testing

After installation and termination of fiber optic cable, test each strand of fiber to verify that the installed cable meets the performance requirements described below. Each strand shall be tested at both the 850nm and 1300nm wavelengths. Provide a printout of the trace for each test to the Engineer for review and approval.

### Documentation

Test documentation for fiber optic cabling shall include the following:

A digitally signed PDF document from the Contractor's RCDD certifying that all cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.

An introductory discussion documenting test instruments used, qualifications of operators, test conditions, setup parameters, length of the fiber launch cord, and any other pertinent information.

A full size full page of the OTDR trace for each strand at 850nm and 1300nm wavelengths. Each strand shall be clearly identified using the labeling nomenclature described on the drawings. Each trace shall clearly indicate the name of the operator who performed the test, and the date of the test.

Insert all fiber optic cable test documentation in the Cable Test Manual.

#### Fiber Optic Cable Performance Requirements

Each strand of the installed fiber optic cabling, with mated connectors at each end, shall have a total power loss (in db) less than or equal to the manufacturers' performance specifications for the cable and connectors called for in the contract documents, when adjusted for the installed length, and with an allowable deviation of 1.0 db. If the test results for a given strand or strands, in the judgement of the Engineer, indicate excessive power loss, the Contractor shall repolish, reconnect, or replace the affected cables as required to achieve specified performance levels as demonstrated by retesting.

#### Category 5e UTP Cable Testing

Category 5E cable shall be tested with a Level II tester.

Notify the Engineer in writing not less than five days prior to commencing Category 5E UTP cable testing. The Engineer may elect to be present for and witness cable testing.

Record all test conditions and setup parameters and include in a typed discussion to be provided with test documentation.

#### Post-Installation Testing

After installation and termination of the Category 5e UTP cable, test each cable in accordance with TIA/EIA test specifications. Test each cable from both ends with a Category 5e tester, Fluke DSP 4000 series or approved equal, to verify compliance with TIA/EIA specifications for Category 5e UTP, "Basic Link" configuration, Level II accuracy, with no allowable deviation. Test at the full range of frequencies indicated by TIA/EIA up to and including 100 MHz. Use the tester to measure near-end crosstalk (NEXT) and attenuation-to-crosstalk (ACR) from both ends of each cable. Make connections at each end using access cables provided by the tester manufacturer.

#### Documentation

Test documentation for Category 5e cabling shall include the following:

A letter from the Contractor's RCDD certifying that all cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.

An introductory discussion documenting test instruments used, qualifications of operators, test conditions, setup parameters, and any other pertinent information.



One copy of a full page hardcopy printout for each cable test using the tester manufacturer's standard "Cable Certification Report - CAT5e Link Autotest". Each report shall include the NEXT and ACR results for each pair combination from both ends of each cable. Each cable shall be clearly identified using the labeling nomenclature described on the drawings. Each report shall clearly indicate the name of the operator who performed the test, and the date of the test.

Insert all Category 5e cable test documentation in the Cable Test Manual.

#### Category 5e Cable Performance Requirements

If the test results for a given cable or cables, in the judgment of the Engineer, fail to confirm acceptable performance, the Contractor shall reconnect or replace the affected cables as required to achieve specified performance levels as demonstrated by retesting.

### PRODUCT DELIVERY, STORAGE AND HANDLING

#### Protections

Take necessary precautions to protect all material, equipment, apparatus, and work from damage. Failure to do so to the satisfaction of the Architect will be sufficient cause for the rejection of the material, equipment, or work in question. Contractor is responsible for the safety and good condition of the materials installed until final acceptance by the Owner

#### Cleaning

Conduit openings shall be capped or plugged during installation. Fixtures and equipment shall be tightly covered and protected against dirt, moisture, chemical, and mechanical injury. At the completion of the work, the fixtures, material and equipment shall be thoroughly cleaned and delivered in condition satisfactory to the Architect.

### PART 3 - EXECUTION

#### CLEANING UP

Prior to the Substantial Completion Inspection, perform final cleanup of all work and all areas in which work was performed. All work areas shall be left vacuum clean. All raceway, faceplates, jack assemblies, racks, panels, data hub equipment, and the like shall be wiped down to remove dust accumulated during the course of the project. All painted surfaces such as backboards shall be touched up with paint to remove scuff marks, pencil marks, scratches, etc. All factory surfaces shall be touched with matching paint.

#### SUBSTANTIAL COMPLETION

After Final Checkout of system operation, and with the Final Checklist, Final Compliance Cable Test Results CD/DVD disk, and the O&M Manuals in hand, the Contractor shall notify the Architect/Engineer in writing and with a completed copy of the Final Checklist. The Contractor's project manager and project senior technician shall be present for the Substantial Completion Inspection.

## CORRECTIVE ACTION

The contractor shall correct any and all deficiencies listed for completion or correction within a reasonable amount of time after deficiency is noted.

If, in the opinion of Owner, Architect, or Engineer (A/E), the Contractor fails to correct any items to the A/E's satisfaction after sufficient corrective action has been attempted by the contractor, then the A/E shall have the right, after forty-eight (48) hours written notice, to employ such workmen to complete the requirements of this project, who will perform work as required to the satisfaction of the A/E, and the cost to complete the Work shall be charged to Contractor.

## OWNER PERSONNEL TRAINING

Subsequent to Substantial Completion but prior to Final Completion, the Contractor shall provide on-site training to Owner personnel on the operational use of the features of the system and the use of all equipment provided. The cost of training shall be included in the cost of the system.

The Engineer shall be notified prior to training and may participate in training at their discretion.

The instruction shall be presented in an organized and professional manner by personnel who are thoroughly familiar with the structured cabling system in the existing facility. Training shall include a "walk-through" of the systems to identify and locate closets, panels, and important system components, a discussion of overall system concepts and configuration, specific instruction in labeling and patch cord move/changes, a review of the as-built drawings, a review of the system verification and acceptance documentation, and guidelines for basic trouble-shooting and operation of the structured cabling system and data hub equipment.

The Contractor shall provide documentation of training (including names of personnel present at each training session) to the Engineer at the Final Completion Inspection. The documentation shall be signed-off by the Owner. The documentation shall be three-hole punched and ready for insertion in the O&M manuals.

## FINAL COMPLETION

Following completion of punch list items generated by the Architect/Engineer as a result of the Substantial Completion Inspection, the Contractor shall notify the architect/Engineer in writing, stating that all punch list items have been completed.

## WARRANTY AND MAINTENANCE

Contractor warrants all work performed by him directly and all work performed for him by others. Contractor shall assume ownership of all data systems within area of work as defined by the plans. Contractor shall provide new outlets/jacks/cabling as required for systems to ensure permanent link solution testing. The requirement for this project is full compliance/zero tolerance. Cables which do not comply shall be removed and replaced.

If certain cables do not comply, contractor shall notify engineer and may be deemed (at engineer's discretion) considered part of contractor's required "Additional Materials Requirement" in the specifications and be replaced with new.

All materials, equipment and workmanship incorporated in the work shall be guaranteed by the Contractor for a period of fifteen years from the date of Substantial Completion of the project.

Any work, material or equipment which during the warranty period is, in the opinion of the Engineer or the Owner's Authorized Representative, defective or inferior and not in accordance with the contract documents, shall be made good at no additional cost to the Owner, including any other work which may have been damaged because of such deficiencies. The Contractor shall be the contact person and the person responsible for coordinating all warranty work for the Owner.

When equipment cannot be repaired at the site, the Contractor shall be completely and solely responsible for the coordination and completion of equipment repairs, including pickup at the project site, transportation and shipping costs to and from the repair site, and reinstallation and reintegration into the system. Equal or better loaner equipment shall be provided and installed by the Contractor any time equipment cannot be repaired at the site, so that the system is maintained in continuous working order as before the equipment failed.

The services of a qualified technician shall be available to make necessary warranty repairs in a timely manner during the warranty period.

## SUPPORT SERVICES

### Service Description

#### System Startup

After Equipment Verification and before Final Checkout, the Contractor shall start the systems up, and in coordination with the Owner make it fully operational. The System Startup shall be made at a time, approved in writing by the School District, when school is not in regular session. A weekend startup may be required, and if so shall be provided at no additional cost to the School District. All existing circuits and connections disturbed by work under this contract shall be reconnected, properly identified/labeled, and checked out for proper operation during the System Startup.

#### Final checkout

After System Startup and before the first day of school following System Startup, the Contractor shall perform a Final Checkout of the system as a whole to verify that it is ready for use by school personnel. The Contractor shall utilize a Final Checklist to fully document Final Checkout. Provide a copy of the Final Checklist to the Engineer at the Final Inspection.

#### First day operation

The Contractor shall have a senior technician present at the site for the first full 8 hour day of school following the Final Checkout to train/assist school personnel and to

verify/fine tune system operation. The senior technician shall make follow-up visits as required to bring the system into full operating condition to the satisfaction of the School Principal, the Owner's Authorized Representative, and the Engineer.

#### Documentation

Manufacturer shall provide system documentation including:

System one-line showing all patch panels, racks, number and type of devices and the connections between systems and to the service entrance.

Drawings for each system showing hardware configuration and numbering.

Typical wiring diagrams for each component.

The manufacturer will certify that the products will meet the product specifications.

END OF SECTION 16950