# SECTION 00 01 01 PROJECT TITLE PAGE

# Project Specifications for: Huntsville Readiness Center

Owner:
Armory Commission of Alabama
1720 Congressman WL Dickinson Drive
Montgomery, AL 36109

Architect: Seay Seay & Litchfield, P.C. 1115 South Court Street Montgomery, AL 36104

VOLUME No. 01

IFB #: AC-25-B-0006-S

Date: November 1, 2024

Set Number \_\_\_\_\_

Prepared \_\_\_\_\_

Checked \_\_\_\_\_

Approved \_\_\_\_\_

PROJECT TITLE PAGE 00 01 01-1

#### **SECTION 00 01 03 - PROJECT DIRECTORY**

(Revised 22 June 2021)

#### **PART 1 GENERAL**

#### 1.01 SECTION INCLUDES

A. Identification of project team members and their contact information.

#### 1.02 OWNER:

- A. Name: Armory Commission of Alabama
  - 1. Address: 1720 Cong. W.L. Dickinson Drive
  - 2. City: Montgomery
  - 3. State: AL
  - 4. Zip Code: 36109

# 1.03 ARCHITECT/ENGINEER OF RECORD:

- A. Architect:
  - Company Name: Seay Seay & Litchfield, P.C.
    - a. Address: 1115 South Court Street
    - b. City: Montgomery
    - c. State: Alabama
    - d. Zip Code: 36104
    - e. Telephone: 334-263-5162
  - Primary Contact: .
    - a. Title: Principal
    - b. Name: Casey Ivy
    - c. Telephone: 334-263-5162
    - d. Email: civy@sslarch.com

#### 1.04 CONSULTANTS TO THE ARCHITECT/ENGINEER OF RECORD:

- A. Civil Engineering Consultant:
  - Company Name: Reeves Engineering and Construction, LLC
    - a. Address: 200 Grove Park Ln. #680
    - b. City: Dothan
    - c. State: Alabama
    - Zip Code: 36305
- B. Structural Engineering Consultant:
  - Company Name: LBYD Engineers
    - a. Address: 1100 South College Street, Suite 201
    - b. City: Auburn
    - c. State: Alabama
    - d. Zip Code: 36832
- C. Mechanical Engineering Consultant:
  - 1. Company Name: Whorton Engineering, Inc.
    - a. Address: 25 Summerall Gate Rd.
    - b. City: Anniston

    - c. State: Alabamad. Zip Code: 36205
- D. Electrical Engineering Consultant:
  - Company Name: Gunn & Associates, P.E.
    - a. Address: 3102 Highway 14
    - b. City: Millbrook
    - c. State: Alabama
    - d. Zip Code: 36054

#### **PART 2 PRODUCTS - NOT USED**

# **PART 3 EXECUTION - NOT USED**

**END OF SECTION** 

PROJECT DIRECTORY 00 01 03-1

#### **SECTION 00 01 07 - PROFESSIONAL SEALS**

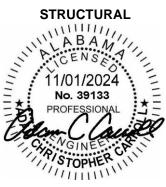
#### PROFESSIONAL SEALS OF DESIGN PROFESSIONALS:

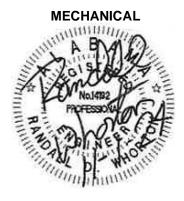
1.01 THE SPACE ALLOTTED BELOW IS FOR PROFESSIONAL SEALS OF DESIGN PROFESSIONALS RESPONSIBLE FOR PREPARING THE CONSTRUCTION DOCUMENTS.











**END OF SECTION** 

PROFESSIONAL SEALS 00 01 07-1

# **SECTION 00 01 10 - TABLE OF CONTENTS**

(Revised: 17 August 2021)

#### **VOLUME 01**

#### PROCUREMENT AND CONTRACTING REQUIREMENTS

Division 00 Procurement and Contracting Requirements	
00 01 01 - Project Title Page	1
00 01 03 - Project Directory (Revised: 22 June 2021)	1
00 01 07 - Professional Seals	1
00 01 10 - Table of Contents (Revised: 17 August 2021)	6
00 01 15 - List of Drawing Sheets	5
00 21 00 - Instructions to Bidders (Revised: 31 October 2024)	4
00 41 00 - Proposal Form (Revised: 31 October 2024)	3
00 43 00 - Form of Bid Bond (Revised: 31 October 2024)	1
00 43 25 - Substitution Request Form During Bidding (Revised: 14 January 2021)	2
00 45 19 - Disclosure Statement	2
00 52 00 - Construction Contract Form	7
00 61 13 - Performance Bond Form	3
00 61 16 - Payment Bond Form	2
00 62 76 - Contractor's Periodical Request for Partial Payment	3
00 62 77 - Sales Tax Abatement	11
00 62 78 - Inventory of Stored Materials	1
00 62 83 - Contractor's Draw Schedule	1
00 62 90 - NOT USED	
00 63 56 - Weather Delay Documentation Form (Revised 3 August 2021)	1
00 65 13 - Form of Advertisement of Completion	1
00 65 15 - Sample Affidavit of Publication Form	1
00 65 16 - Affidavit of Payment of Debts & Claims	1
00 65 17 - Affidavit of Release of Liens	1
00 65 19 - Consent of Surety to Final Payment Form	1
00 65 20 - Final Completion Form (Revised: 3 August 2021)	1
00 65 36 - State of Alabama Roofing Guarantee	2
00 72 00 - General Conditions of the Contract	39
00 73 00 - Special Conditions of the Contract	3
SPECIFICATIONS	
Division 01 General Requirements	
01 1000 - Summary of Work (Revised: 17 August 2021)	2
01 2100 - Allowances	2
01 2200 – Unit Prices	1
01 2300 – Alternates	2
01 2513 - Product Substitution Procedures	3
01 2514 - Substitution Request Form During Construction (Revised 14 January 2021)	3
01 2600 - Contract Modification Procedures	2
01 2614 – Change Order Recap Form	1
01 2620 – Request for Information Form	1
01 2900 – Payment Procedures	3

Huntsville Readiness Center	SS&L# 21112	November 1, 2024
Huntsville, AL 01 3100 – Project Managemen	at and Coordination (Revised: 8 April 2021)	5
01 3200 – Construction Progre	<del></del>	5
01 3201 – Project Schedule (R		12
01 3300 – Submittal Procedure	,	2
01 4000 - Quality Requirement		7
01 5000 - Temporary Facilities		2
01 6000 - Product Requiremen		3
01 7300 – Execution		5
01 7329 - Cutting and Patchin	g	3
01 7700 - Project Closeout (Re		5
01 7813 - Project Closeout Ch	ecklist (Revised: 31 October 2024)	1
01 7839 – Project Record Doc	uments	3
01 7846 - Attic Stock Spreads	heet	1
01 7900 - Demonstration and	Training	6
01 9113 – General Commissio	ning Requirements (Revised: 9 April 2021)	18
<b>Division 02 Existing Condition</b>	ns	
02 4100 - Demolition		5
Division 03 Concrete		
03 2000 – Concrete Reinforcir	ng	4
03 3000 - Cast-In-Place Cond	crete	19
03 3680 - Concrete Polishing	and Dying	7
Division 04 Masonry		
04 2000 - Unit Masonry		14
04 7200 - Cast Stone Masonr	у	6
Division 05 Metals		
05 1200 – Structural Steel Fra	ming	10
05 3100 - Steel Decking		5
05 4400 - Cold-Formed Metal	Trusses	6
05 5000 - Metal Fabrications		6
Division 06 Wood, Plastics, ar	nd Composites	
06 1000 - Rough Carpentry		7
06 2000 - Finish Carpentry		3
06 4100 - Architectural Wood	Casework	7
Division 07 Thermal and Mois	ture Protection	
07 1113 - Bituminous Dampp	roofing	2
07 1300 – Sheet Waterproofin	g	4
07 2100 - Thermal Insulation		3
07 2119 – Spray Foam Insulat	tion	4
07 2500 – Weather Barriers		15
07 4113 – Metal Roof Panels		15
07 4213 - Ribbed Metal Wall	Panels	12
07 4293 - Metal Soffit Panels		9
07 4313 – Linear Metal Ceiling	g System	9
07 6200 - Sheet Metal Flashir	ng and Trim	8
07 6500 - Wall Flashing		8

Huntsville Readiness Center	SS&L# 21112	November 1, 202
Huntsville, AL 07 7123 – Manufactured Gutter	s and Downspouts	5
07 8401 – Firestopping	- aa 2	14
07 9005 – Joint Sealers		8
Division 08 Openings		·
08 1113 – Hollow Metal Doors a	and Frames	14
08 3100 – Access Doors and Pa		3
08 3313 – Coiling Counter Door	rs	4
08 3323 – Overhead Coiling Do		6
08 3402 – Bullet-Resistant Com		16
08 3459 – Vault Door	'	15
08 4114 – Fire-Rated Aluminum	r Framed Entrances and Storefronts	10
08 4313 – Aluminum-Framed S	torefronts	9
08 4413 – Glazed Aluminum Cเ	ırtain Walls	10
08 7100 – Door Hardware		32
08 8000 – Glazing		9
08 8813 – Fire-Rated Glazing –	60 Minute	7
08 9100 – Louvers		4
Division 09 Finishes		
09 2116 – Gypsum Board Asse	mblies	8
09 3000 – Tiling		12
09 5100 - Acoustical Ceilings		4
09 6513 - Resilient Base		4
09 6519 – Resilient Tile Flooring	g	9
09 6566 – Resilient Athletic Floo	oring	5
09 9000 - Painting and Coating		10
Division 10 Specialties		
10 1101 – Visual Display Board	s	4
10 1400 – Signage		6
10 2113.19 - Plastic Toilet Com	npartments	6
10 2200 – Movable Wall Systen	n	8
10 2213 – Wire Mesh Partitions		7
10 2800 – Toilet, Bath, and Lau	ndry Accessories	4
10 4400 – Fire Protection Speci	alties	3
10 7200 - Aluminum Canopies		5
10 7202 – Rod Supported Extru	ided Aluminum Canopies	5
10 7500 – Flagpoles		3
Division 11 Equipment		
11 4000 – Foodservice Equipme	ent	13
Division 12 – Furnishings		
12 2113 – Horizontal Louver Bli	nds	3
12 3600 – Countertops, Integra	Lavatories, and Window Sills	5
<b>Division 13 Special Construction</b>		
13 3419 – Metal Building Syster		21
13 5000 – Standard Pre-Assem	•	3
<b>Division 14 Conveying Equipme</b>	ent	

Huntsville Readiness Center	SS&L# 21112	November 1, 202
Huntsville, AL  Division 21 Fire Suppression		
• •	rements for Fire Suppression Equipment	3
·	eals for Fire-Suppression Equipment	5
21 0518 – Escutcheons for Fire S	'''	2
	or Water-Based Fire-Suppression Piping	7
•	for Fire-Suppression Piping and Equipment	8
•	Controls for Fire-Suppression Piping and Equipme	
	suppression Piping and Equipment	5
21 1119 – Fire Department Conne		3
21 1313 – Wet-Pipe Sprinkler Sys		18
VOLUME NO. 02		
Division 22 – Plumbing		
22 0510 – Basic Mechanical Requ	uirements	4
22 0511 – Basic Mechanical Mate		8
22 0513 – Common Motor Requir		3
22 0517 – Sleeves and Sleeve Se	<b>.</b>	5
22 0518 – Escutcheons for Plumb		2
22 0519 – Meters and Gages for		10
22 0523.12 – Ball Valves for Plum		12
22 0523.14 – Check Valves for Pl		10
22 0523.15 – Gate Valves for Plu		6
	for Plumbing Piping and Equipment	13
• , ,	Controls for Plumbing Piping and Equipment	9
22 0553 – Identification for Plumb		6
22 0719 – Plumbing Piping Insula		20
22 1116 – Domestic Water Piping		14
22 1119 – Domestic Water Piping		15
22 1123 – Facility Natural-Gas Pi	•	20
22 1123.21 – Inline, Domestic-Wa	•	7
22 1316 – Sanitary Waste and Ve	•	12
22 1319 – Sanitary Waste Piping		6
22 1319.13 – Sanitary Drains		3
22 1513 – General-Service Comp	oress-Air Piping	10
22 3400 – Fuel-Fired, Domestic-V		18
22 4213.13 – Commercial Water		6
22 4213.16 – Commercial Urinals		6
22 4216.13 – Commercial Lavato		8
22 4216.16 – Commercial Sinks		7
Division 23 Heating, Ventilating,	and Air-Conditioning (HVAC)	•
23 0510 – Basic Mechanical Requ		4
23 0511 – Basic Mechanical Mate		8
23 0513 – Common Motor Requir		3
23 0517 – Sleeves and Sleeve Se		6
23 0518 – Escutcheons for HVAC		2
23 0519 – Meters and Gages for		7
	r J	•

Huntsville Readiness Center	SS&L# 21112	November 1, 2	2024
Huntsville, AL 23 0523.11 – Globe Valves for HVAC F	Piping		5
23 0523.12 - Ball Valves for HVAC Pip	, •		10
23 0523.13 – Butterfly Valves for HVAC	•		5
23 0523.15 – Gate Valves for HVAC Pi	iping		6
23 0529 – Hangers and Supports for H	VAC Piping and Equipment		11
23 0548 – Vibration and Seismic Contro	, ,		11
23 0553 – Identification for HVAC Pipin	ng and Equipment		7
23 0593 – Testing, Adjusting, and Balar	ncing		7
23 0713 – Duct Insulation	-		21
23 0719 – HVAC Piping Insulation			26
23 0800 – Commissioning of HVAC			3
23 0920 – Temperature Control System	n (TCS) and Facility Management Control S	System (FMCS)	18
23 0921 - BAS - System Integrator (BA	AS SI)		8
23 09 93.11 - Sequence of Operations	for HVAC DDC		17
23 2113 – Hydronic Piping			15
23 2113.33 – Ground-Loop Heat-Pump	Piping		3
23 2116 – Hydronic Piping Specialties			6
23 2123 – Hydronic Pumps			11
23 2300 – Refrigerant Piping			12
23 2513 – Water Treatment for Closed-	-Loop Hydronic Systems		5
23 3113 - Metal Ducts			21
23 3300 - Duct Accessories			5
23 3713 - Air Outlets and Inlets			6
23 8146 - Water-Source Unitary Heat F	Pumps		8
Division 24 RESERVED (NOT USED)			
Division 25 Integrated Automation			
Division 26 Electrical			
26 0100 – Electrical			44
26 0667 - Manual Transfer Switches			4
26 0715 - Data/Telecommunications			10
26 0726 - Public Address Systems			11
26 6213 - Engine Generators			20
26 6415 – Automatic Transfer Switches	3		7
28 3176 - Interior Fire alarm and Mass	Notification System, Addressable		40
Division 27 Communications			
Division 28 Electronic Safety and Secu	urity		
28 3176 – Interior Fire Alarm and Mas	ss Notification System, Addressable		40
Division 31 Earthwork			
31 0020 - Erosion Control			3
31 0200 – Temporary Erosion and Sedi	iment Control		11
31 1001 - Site Clearing			4
31 2210 – Earthwork			13
31 3116 – Termite Control			4
Division 32 Exterior Improvements			
32 1217 – Asphalt Concrete Paving			4

Huntsville Readiness Center	SS&L# 21112	November 1, 2024
Huntsville, AL 32 1314 – Cement Concrete Paving		13
32 1720 – Pavement Joint Sealants		4
32 3113 – Chain Link Fences and Gates		3
32 9219 – Seeding		3
32 9223 – Sodding		4
32 9300 – Exterior Plants		6
Division 33 – Utilities		O
33 0000 – Utilities		8
33 1117 – Outside Water System		5
33 3112 – Sanitary Sewerage		5
Division 34 Transportation		3
Division 35 Waterway and Marine Const	ruction	
Division 36 RESERVED (NOT USED)		
Division 37 RESERVED (NOT USED)		
Division 38 RESERVED (NOT USED)		
Division 39 RESERVED (NOT USED)		
Division 40 Process Integration		
Division 41 Material Processing and Har	adling Equipment	
Division 42 Process Heating, Cooling, a	•	
Division 43 Process Gas and Liquid Han	, , ,	nont.
Division 44 Pollution Control Equipment	• • • • • • • • • • • • • • • • • • • •	lent
• •		
Division 45 Industry-Specific Manufactu	•	
DIVISION 46 Water and Wastewater Equ	ipment	
Division 47 RESERVED (NOT USED)		
Division 48 Electrical Power Generation		
Division 49 RESERVED (NOT USED)		

**END OF SECTION** 

# **SECTION 00 01 15 - LIST OF DRAWINGS**

<u>NUMBER</u>	SHEET TITLE
T1.0	TITLE SHEET
T1.1	DRAWING INDEX
T2.0	GENERAL WORK NOTES, ABBREVIATIONS & SYMBOLS
T3.0	TYPICAL MOUNTING HEIGHTS & CLEARANCES

LIFE SAFETY	<u>(</u>
LS1.0	LIFE SAFETY
LS2.0	LIFE SAFETY PLAN - READINESS CENTER

# LS2.1 LIFE SAFETY PLAN – UNIT SUPPLY / GPTB

#### **LANDSCAPE**

L1.0	LANDSCAPE SITE PLAN
L1.1	ENLARGED LANDSCAPE SITE PLAN & DETAILS
L2.0	SIGNAGE DETAILS
L2.1	WROGHT IRON FENCE DETAILS

CIVIL	
C1	BOUNDARY AND TOPOGRAPHIC SURVEY
C2	SITE PLAN
C3	GRADE PLAN
C4	CBMPP
C5.1	PRE-DESIGN STORM DRAINAGE AREAS
C5.2	POST-DESIGN STORM DRAINAGE AREAS
C6	STORM DRAINAGE PLAN
C7.1	SANITARY SEWER PLAN
C7.2	SANITARY SEWER PLAN
C7.3	SANITARY SEWER PLAN
C8	WATER DISTRIBUTION SYSTEM
C9	UTILITY PLAN
C10.1	CONSTRUCTION DETALS
C10.2	CONSTRUCTION DETALS
C10.3	CONSTRUCTION DETALS

CONSTRUCTION DETALS

CONSTRUCTION DETALS

# **ARCHITECTURAL**

C10.4

C11

AKCHIIEC	IUNAL
4T1.0	ATFP/ SITE PLAN
4T1.1	FENCE AND GATE DETAILS
4T1.2	CHAIN LINK FENCING DETAILS
4T1.3	CHAIN LINK FENCING DETAILS
RA2.0	REFERENCE FLOOR PLAN – READINESS CENTER
RA2.1	ENLARGED FLOOR PLAN "ZONE A"- READINESS CENTER
RA2.2	ENLARGED FLOOR PLAN "ZONE B" - READINESS CENTER
RA2.3	ENLARGED FLOOR PLAN "ZONE C"- READINESS CENTER
RA2.4	ENLARGED FLOOR PLAN "ZONE D"- READINESS CENTER
RA2.5	ROOF PLAN - READINESS CENTER
RA2.6	WALL TYPE PLAN - READINESS CENTER
RA3.1	FINISH SCHEDULE - READINESS CENTER
RA3.2	DOOR & FRAME SCHEDULES - READINESS CENTER
RA3.3	DOOR DETAILS - READINESS CENTER
RA3.4	OPENING SCHEDULE & DETAILS - READINESS CENTER
RA3.5	OPENING DETAILS - READINESS CENTER
RA3.6	OPENING DETAILS
2A37	OPENING DETAILS - FIRE RATED STOREFRONT TYPE 13

LIST OF DRAWINGS

Huntsville	Readiness Center	SS&L# 21112	November 1, 2024
Huntsville,	AL		·
RA4.1	ELEVATIONS - READINESS CEN	ΓER	
RA5.1	BUILDING SECTIONS - READINE	ESS CENTER	
RA5.2	WALL SECTIONS & DETAILS - RE	EADINESS CENTER	
RA5.3	WALL SECTIONS & DETAILS - RE	EADINESS CENTER	
RA5.4	WALL SECTIONS & DETAILS - RE	EADINESS CENTER	
RA5.5	WALL SECTIONS & DETAILS		
RA5.7	VESTIBULE SECTIONS – READIN		
RA5.8	ENLARGED VESTIBULE SECTION		
RA5.9	ENLARGED VESTIBULE SECTION		
RA5.10	WALL SECTIONS DETAILS AT VE		
RA6.1		& ELEVATIONS – READINESS CENTER	
RA6.2		& ELEVATIONS – READINESS CENTER	
RA6.3		NT PLAN & SCHEDULES – READINESS CE	ENTER
RA7.1	LOBBY INTERIOR ELEVATIONS -		
RA7.2	ASSEMBLY HALL INTERIOR ELEV		
RA7.3	INTERIOR ELEVATIONS AND DE		
RA8.1	REFLECTED CEILING PLAN – RE		
RA8.2	ENLARGED CEILING PLAN "ZO		
RA8.3	ENLARGED CEILING PLAN "ZO		
RA8.4	ENLARGED CEILING PLAN "ZO		
RA8.5	ENLARGED CEILING PLAN "ZO		
RA9.1	FLOOR PATTERN PLAN – READ	INESS CENTER	
RA10.1	CONCEPTUAL FF&E PLANS		
GA2.0	REFERENCE FLOOR PLAN – UN	IT SUPPLY/GPTB	
GA2.1	ENLARGED FLOOR PLAN "ZON	IE A'' – UNIT SUPPLY/GPTB	
GA2.2	ENLARGED FLOOR PLAN "ZON	IE B'' – UNIT SUPPLY/GPTB	
GA2.3	PLATFORM PLAN – UNIT SUPPL'	Y/GPTB	
GA2.4	ROOF PLAN – UNIT SUPPLY/GP	ТВ	
GA2.5	WALL TYPE PLAN – UNIT SUPPL'	Y/GPTB	
GA2.6	ROOF CALLOUTS & DETAILS – I	JNIT SUPPLY/GPTB	
GA3.1	DOOR & FRAME SCHEDULES -	UNIT SUPPLY/GPTB	
GA3.2	OPENING DETAILS – UNIT SUPP		
GA3.3	OPENING DETAILS – UNIT SUPP		
GA4.1	ELEVATIONS – UNIT SUPPLY/GF		
GA5.1	BUILDING SECTIONS — UNIT SUF	PLY/GPTB	

**STRUCTURAL** 

GA5.2

GA6.1 GA8.1

GA9.1

<u> </u>	<u></u>
S.01A	GENERAL NOTES
S.01B	GENERAL NOTES
S.02	SPECIAL INSPECTIONS
S.03	SPECIAL INSPECTIONS
S.04	DRAWING STANDARDS & ABBREVIATIONS
S.05	COMPONENTS AND CLADDING
S.06	TYPICAL DETAILS
S.07	TYPICAL DETAILS
S.08	TYPICAL DETAILS
S.09	TYPICAL DETAILS
S.10	TYPICAL DETAILS
S.11	TYPICAL DETAILS
S3.1	SECTIONS
S3.2	SECTIONS
\$3.3	SECTIONS

SECTIONS & DETAILS - UNIT SUPPLY/GPTB

REFLECTED CEILING PLAN – UNIT SUPPLY/GPTB

ENLARGED RESTROOM PLANS & ELEVATIONS - UNIT SUPPLY/GPTB

FLOOR PATTERN PLAN & FINISH SCHEDULE - UNIT SUPPLY/GPTB

LIST OF DRAWINGS 00 01 15-2

Huntsville	Readiness Center	SS&L# 21112	November 1, 2024
Huntsville,	AL		
\$3.4	SECTIONS		
S3.5	SECTIONS		
\$3.6	SECTIONS		
S3.7	SECTIONS		
\$3.9	SECTIONS		
RS2.0	READINESS CENTER FOUNDA		
RS2.1	READINESS CENTER ROOF FR		
RS2.2	READINESS CENTER HIGH RO		
G\$2.0	UNIT SUPPLY / GPTB FOUNDA		
G\$2.1	UNIT SUPPLY / GPTB ROOF FR	PAMING PLAN	
GEOTHER!	441		
RGT1.1	GOTHERMAL LOOP FIELD NO	)TES	
RGT1.1	GEOTHERMAL DETAILS	7123	
RGT2.1	GEOTHERMAL LOOP FIELD SI	TE PLAN	
RGT2.1	GEOTHERMAL LOOP FIELD RI		
KO12,2	OLOTTILININE LOOF TILLD IN	JER DIMORMAN	
MECHANI	<u>CAL</u>		
RM1.1	READINESS CENTER HVAC LE	GEND AND NOTES	
RM1.2	READINESS CENTER HVAC SC	CHEDULES	
RM1.3	READINESS CENTER HVAC SC	CHEDULES	
RM1.4	READINESS CENTER HVAC SC		
RM1.5	READINESS CENTER HVAC SC		
RM1.6	READINESS CENTER HVAC SC		
RM1.7	READINESS CENTER HVAC SC		
RM2.1	READINESS CENTER HVAC DI		
RM2.2	READINESS CENTER HVAC DI		
RM2.3	READINESS CENTER HVAC DI		
RM2.4	READINESS CENTER HVAC DI		
RM2.5	READINESS CENTER HVAC DI		
RM2.6 RM2.7	READINESS CENTER HVAC DI READINESS CENTER HVAC DI		
RM2.7 RM2.8	READINESS CENTER HVAC DI		
RM2.9	READINESS CENTER HVAC DI	-17 1120	
RM2.7	READINESS CENTER HVAC DI		
RM2.11	READINESS CENTER HVAC DI		
RM2.12	READINESS CENTER HVAC DI		
RM2.13		OMPLIANCE CALCULATIONS	
RM2.14		OMPLIANCE CALCULATIONS	
RM3.1	ZONE A – READINESS CENTER		
RM3.2	ZONE B – READINESS CENTER	- HVAC PLAN	
RM3.3	ZONE C – READINESS CENTER	R – HVAC PLAN	
RM3.4	ZONE D – READINESS CENTER	R – HVAC PLAN	
RM3.5	ZONE A- READINESS CENTER-	- OUTSIDE AIR/ EXHAUST HVAC PLAN	
RM3.6		OUTSIDE AIR/ EXHAUST HVAC PLAN	
RM3.7		- OUTSIDE AIR/ EXHAUST HVAC PLAN	
RM3.8		- OUTSIDE AIR/ EXHAUST HVAC PLAN	
RM4.1		R – HVAC HYDRONIC PIPING PLAN	
RM4.2		- HVAC HYDRONIC PIPING PLAN	
RM4.3		R – HVAC HYDRONIC PIPING PLAN	
RM4.4		R – HVAC HYDRONIC PIPING PLAN	
RM4.5	KEADINESS CENTER - HVAC	HYDRONIC PIPING RISER DIAGRAM	
GM1.1	UNIT SUPPLY / GPTB HVAC LE	EGEND AND NOTES	
GM1.2	UNIT SUPPLY / GPTB HVAC SO		
GM1.2	LINIT SUPPLY / GPTB HVAC SO		

LIST OF DRAWINGS 00 01 15-3

UNIT SUPPLY / GPTB HVAC SCHEDULES UNIT SUPPLY / GPTB HVAC SCHEDULES

GM1.3

GM1.4

Huntsville, AL

GM2.1 UNIT SUPPLY / GPTB HVAC DETAILS

GM2.2 UNIT SUPPLY / GPTB HVAC DETAILS

GM 2.3 UNIT SUPPLY / GPTB HVAC DETAILS

GM 2.4 UNIT SUPPLY / GPTB HVAC DETAILS

GM 2.5 UNIT SUPPLY / GPTB HVAC DETAILS
GM2.6 UNIT SUPPLY / GPTB HVAC DETAILS

GM2.7 UNIT SUPPLY / GPTB HVAC DETAILS

GM2.8 UNIT SUPPLY / GPTB HVAC COMPLIANCE CALCULATIONS

GM3.1 ZONE A – UNIT SUPPLY / GPTB – HVAC PLAN
GM3.2 ZONE B – UNIT SUPPLY / GPTB – HVAC PLAN

GM4.1 ZONE A – UNIT SUPPLY / GPTB – HVAC HYDRONIC PIPING PLAN
GM4.2 ZONE B – UNIT SUPPLY / GPTB – HAVAC HYDRONIC PIPING PLAN
UNIT SUPPLY / GPTB – HVAC HYDRONIC PIPING RISER DIAGRAM

#### **PLUMBING**

RP1.1 READINESS CENTER – PLUMBING, SCHEDULES, LEGEND, AND NOTES

RP1.2 READINESS CENTER - PLUMBING, SCHEDULES, AND DETAILS

RP1.3 READINESS CENTER – PLUMBING DETAILS

RP2.1 READINESS CENTER – WASTE & CONDENSATE PLUMBING PLAN – ZONE A

RP2.2 READINESS CENTER – WASTE & CONDENSATE PLUMBING PLAN – ZONE B RP2.3 READINESS CENTER – WASTE & CONDENSATE PLUMBING PLAN – ZONE C

RP2.4 READINESS CENTER – WASTE & CONDENSATE PLUMBING PLAN – ZONE D

RP3.1 READINESS CENTER – WATER & GAS PLUMBING PLAN – ZONE A

RP3.2 READINESS CENTER – WATER & GAS PLUMBING PLAN – ZONE B

RP3.3 READINESS CENTER – WATER & GAS PLUMBING PLAN – ZONE C

RP3.4 READINESS CENTER – WATER & GAS PLUMBING PLAN – ZONE D

RP4.1 READINESS CENTER – WASTE PLUMBING RISDER DIAGRAM – ZONES A & C RP4.2 READINESS CENTER – WASTE PLUMBING RISER DIAGRAM – ZONES B & D

RP4.3 READINESS CENTER – WATER PLUMBING RISER DIAGRAMS

RP4.4 READINESS CENTER – GAS PLUMBING RISER DIAGRAM

GP1.1 GPTB – PLUMBING SCHEDULES, LEGEND, NOTES, AND DETAILS

GP1.2 GPTB – PLUMBING DETAILS

GP1.3 GPTB – PLUMBING DETAILS

GP2.1 GPTB – WASTE, AIR, & CONDENSATE PLUMBING PLAN – ZONE A

GP2.2 GPTB – WASTE, AIRE, & CONDENSATE PLUMBING PLAN – ZONE B

GP3.1 GPTB – WATER PLUMBING PLAN – ZONE A

GP3.2 GPTB – WATER & GAS PLUMBING PLAN – ZONE B

GP4.1 GPTB – WASTE PLUMBING RISER DIAGRAMS

GP4.2 GPTB – WATER PLUMBING RISER DIAGRAM

GP4.3 GPTB – GAS PLUMBING RISER DIAGRAM

#### FIRE SUPRESSION

RSP1.1 READINESS CENTER FIRE SPRINKLER LEGEND, NOTES, & DETAILS

RSP2.1 RC – FIRE SPRINKLER PLUMBING PLAN – ZONE A

RSP2.2 RC - FIRE SPRINKLER PLUMBING PLAN - ZONE B

RSP2.3 RC - FIRE SPRINKLER PLUMBING PLAN - ZONE C

RSP2.4 RC - FIRE SPRINKLER PLUMBING PLAN - ZONE D

GSP1.1 GPTB – FIRE SPRINKLER LEGEND, NOTES, AND DETAILS

GSP2.1 GPTB – FIRE SPRINKLER PLUMBING PLAN – ZONE A

GSP2.2 GPTB - FIRE SPRINKLER PLUMBING PLAN - ZONE B

#### **ELECTRICAL**

E0.1 ELECTRICAL LEGEND & NOTES ELECTRICAL LEGEND & NOTES

LIST OF DRAWINGS 00 01 15-4

#### **END OF SECTION**

LIST OF DRAWINGS 00 01 15-5

#### **SECTION 00 21 00 - INSTRUCTIONS TO BIDDERS**

(Revised: 31 October 2024)

#### 1. INTENT OF INSTRUCTION:

Instructions to Bidders are included in the Contract Documents to amplify the invitation for Bids, which is abbreviated because of cost and space limitations, and to five other details which interested parties must or should know in order to prepare bids properly.

#### 2. PREQUALIFICATION OF BIDDERS:

Bidders for work costing in excess of \$100,000.00 must be licensed under the terms of existing State laws. 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. Before award of any Contract, any Bidder may be required to file under oath with the Commission a complete Confidential Financial Statement, Equipment Questionnaire, and Experience Questionnaire on forms that will be furnished by the Contracting Officer with the request. If the applicant is a corporation organized in a state other than Alabama, it shall furnish a certificate from the Secretary of State showing that it is qualified to transact business in Alabama.

Copies of the Contract Documents may be obtained from the Contracting Officer, as stated in the Invitation For Bids.

#### 3. EXAMINATION OF CONTRACT DOCUMENTS AND OF THE SITE OF THE WORK:

Before submitting a proposal for the work, the bidders shall carefully examine the Contract 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 proposals. The submission of a proposal shall be prima facie evidence that the bidder has made such examination and visit and has judged for and satisfied himself 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 and contingencies involved.

If, in the performance of the Contract, subsurface or latent conditions are found to be materially different from those indicated by the Drawings and Specifications, or unknown conditions of an unusual or impractical nature are disclosed differing materially from conditions usually inherent in work of the character shown and specified, the attention of the Engineer shall be called immediately to such conditions before they are disturbed. Upon such notice, or upon observation of conditions, the Engineer will promptly make such changes in the Drawings and/or Specifications as he finds necessary to conform to the different conditions, and any increase or decrease in the cost of the Work resulting from such changes will be adjusted as provided under CHANGES IN THE WORK or EXTRA WORK as set forth in the GENERAL CONDITIONS.

#### 4. EXPLANATIONS AND INTERPRETATIONS:

Should any bidder observe any ambiguity, discrepancy, omission, or error in the Drawings and Specifications, or in any other Contract Document, or be in doubt as to the intention and meaning thereof, he should at once report such to the Engineer and request clarification, in writing, with a copy of his request to the Contracting Officer. Clarification will be made only by written addenda sent to all prospective bidders. Neither the Engineer, nor the Contracting Officer will be responsible in any manner 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.

Should conflict occur in or between Drawings and Specifications, a bidder will be deemed to have estimated on the more expensive way of doing the work involved unless he shall have asked for and

obtained the written decision of the Engineer before submission of his bid as to method, materials, or equipment which will be required.

#### 5. CONTENTS OF PROPOSAL FORMS:

The Contracting Officer as stated in the advertisement, will furnish bidders blank bid forms for the work contemplated, indicating the lump sum bid items, alternate bid items, and unit price bid items.

#### 6. LIQUIDATED DAMAGES:

Time is the essence of the Contract and the bidder's attention is called to that clause of the GENERAL CONDITIONS which requires the deduction of a stipulated time charge equal to six percent interest per annum on the total Contract Price for the work for the entire period that any part of the work remains uncompleted after the time specified in the Contract documents for completion of the work which will be deducted by the Contracting Officer from the final estimate and retained by the Owner out of the moneys otherwise due the Contractor in the final payment, not as a penalty but as liquidated damages sustained by the Owner.

#### 7. PREPARATION OF BID:

The bid must be submitted on the bid form furnished by the Owner or Contracting Officer as stated in the Invitation for Bids.

The bid shall be properly signed by the bidder. If the bidder is an individual, his name and post office address must be shown; if a firm or partnership, the name and post office address of each member of the firm or partnership must be shown; if a corporation, the President, Vice-President, or Secretary shall sign and affix the corporate seal, or if the person signing the bid is an agent, the said agent must attach written authorization from the President, Vice-President or Secretary of the corporation, and the bid must show the name of the corporation, the name of the state under the laws of which the corporation is chartered and the names, titles, and business address of the officers.

#### 8. BID GUARANTY:

No bid submitted will be considered unless accompanied by a certified check or bid bond made payable to the Owner in an amount not less than five percent (5%) of the Contractor's bid, but in no event more than ten thousand dollars (\$10,000.00), as a guaranty that the bidder will enter into a contract with the Owner for the Performance of the work and furnish contract bonds for the work if it be awarded to him.

#### 9. DELIVERY OF BIDS:

Each Bid shall be placed, together with Bid Guaranty, in a sealed envelope on the outside of which is written in large letters "Bid" and so marked as to identify the Work bid on and the name of the Bidder. Bid may be delivered in person, or by mail if ample time is allowed for delivery. When sent by mail, preferable special delivery or registered, the sealed Bid marked as indicated above, shall be enclosed in another envelope for mailing. Bid will be received at the place stated and until the hour of the date set in Invitation for Bids for their opening unless notice is given of postponement. No Bid will be accepted or considered which has not been received prior to the hour of the opening date.

#### 10. WITHDRAWAL OR REVISION OF BIDS:

A Bid may be withdrawn at any time prior to the hour fixed for opening of Bids, provided a request in writing executed by the Bidder or his duly authorized representative is filed with the Contracting Officer prior to that time, in which case such Bid, when received will be returned to the Bidder unopened. Telegrams or written communications to correct Bid will be accepted and the Bid corrected in accordance therewith if received by the Contracting Officer prior to the hour set in the Invitation for Bids. No Bid shall be withdrawn, modified, or corrected after the hour set for opening such Bid.

#### 11. OPENING OF BIDS:

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

#### 12. IRREGULAR BID:

Bids 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. Bids in which the unit or lump sum prices bid are obviously unbalanced may be rejected.

#### 13. ERRORS IN BID:

In case or error in the extension of prices, the unit price will govern. In case of discrepancy between the prices shown in the figures and in words, the words will govern.

#### 14. DISQUALIFICATION OF BIDDERS:

Any Bidder using the same or different names for submitting more than one Bid upon any unit, portion, part or section of work will be disqualified from further consideration on that part of the Work. Evidence that any bidder is interested, as a principal, in more than one Bid for the Work (for example, bidding in a partnership; as a joint partnership or association and as a Partnership, association, or individual) will cause the rejection of any such Bid. A Bidder may, however, submit a Bid as a principal and as a subcontractor to some other principal, or may submit a Bid as a subcontractor to as many other principals as he desires, and by so doing will not be liable to disqualification.

If there is reason for believing that collusion exists among the bidders any or all Bids may be rejected, and participants in such collusion may not be considered in future Bids for the same work. Bids in which prices are obviously unbalanced or unresponsive to the Invitation for Bids may be rejected.

The right is reserved to reject a Bid from Bidder who has not paid, or satisfactorily settled, all bills due for labor and material on former contracts in force at the time of letting.

#### 15. CONSIDERATION OF BIDS:

After the Bids are opened and read, the Bid prices will be compared and the results of such comparison will be made public. Until the final award of the Contract, however, the Owner reserves the right to reject any all Bids, and to accept or reject any or all items of any bid and to waive technical errors and any informality if, in his judgement, the best interests of the Owner will thereby be promoted.

#### 16. DETERMINATION OF LOW BIDDER:

The low bidder will be determined by the total Bid of all Items on the bid form that are accepted.

#### 17. AWARD OF CONTRACT:

The Contract will be awarded to the lowest responsible bidder complying with all established requirements of the Contract Documents unless the Owner finds that his bid is unreasonable or that it is not in the interest of the Owner to accept it, and subject to the Owner" right to award on the basis of any bid item or any combination of bid items. A bidder to whom award is made will be notified at the earliest possible date.

#### 18. RETURN OF BID GUARANTIES:

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 Bid established. The Bid Guaranty 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. Should no award be made within thirty days, all Bids will be rejected, and all guaranties returned, unless the successful Bidder agrees

in writing to a stipulated extension in time for consideration of his bid, in which case the Owner may, at his discretion, permit the successful Bidder to substitute a satisfactory bidder's bond for the certified check submitted with his Bid as a Bid Guaranty.

#### 19. EXECUTION OF CONTRACT:

The Contract shall be signed by the successful Bidder, in the number of counterparts provided in the Contract Agreement, and returned to the Contracting Officer with satisfactory Contract Bonds.

#### 20. REQUIREMENTS OF CONTRACT BONDS:

In order to insure the faithful performance of each and every condition, stipulation, and requirement of the Contract and to indemnify and save harmless the Owner 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 and file with the Contracting Officer an acceptable Surety Bond in the amount equal to one hundred (100) per cent 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 State under the Bond, the direct costs of administration, architectural, engineering, and legal services, shall lie against the Contract Bond for Performance of the Work.

In addition thereto, the successful Bidder to whom the Contract is awarded shall furnish at his expense and file with the Contracting Officer another Bond with good and sufficient surety payable to the Owner in an amount equal to fifty (50) per cent of the Contract Price, with the obligation that the Contractor shall promptly make payment to all persons furnishing him or them with labor, materials, equipment, or supplies for or in prosecution of the Work provided for in the Contract and for the payment of reasonable attorneys fees incurred by successful claimants or plaintiffs in suits on said Bond.

#### 21. APPROVAL OF CONTRACT:

No Contract is binding upon the Owner until it has been executed by the Contracting Officer and approved by the Chief National Guard Bureau, and/or the State Building Commission as required by Federal and State laws and regulations.

#### 22. FAILURE TO EXECUTE CONTRACT:

Should the successful Bidder or Bidders to whom a Contract is awarded fail to execute a Contract and furnish acceptable Contract Bonds within ten days following the date of Award, the Owner shall retain form the Proposal Guaranty if it be a certified check or recover from the Principal of the Sureties if the guaranty be a bond the difference between the amount of the Contract as awarded and the amount of the proposal of the next lowest bidder. If no other bids are received, the full amount of the Proposal 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 Owner. In the event of the death of the low bidder (if an individual and not a partnership or corporation) between the date of the opening of bids and the ten days following the date of award of Contract allowed for furnishing the Contract Bonds, the Owner shall return the Proposal Guaranty intact to the estate of the deceased low bidder.

Failure by the Owner to complete the execution of a Contract and to issue a Notice to Proceed within thirty (30) days after its Presentation by the Contractor shall be just cause, unless both parties agree in writing to a stipulated extension in time for issuance of a Notice to Proceed, for withdrawal of the Contractor's bid and Contract Agreement without forfeiture of a certified check or bond.

BID OPENING DATE: December 12, 2024 (Revised: 31 October 2024) BIDDER CONTRACTOR'S LICENSE NO. \_\_\_\_\_ TO: The Armory Commission of Alabama State Military Property and Disbursing Officer Headquarters, Alabama National Guard 1720 Cong. W.L. Dickinson Drive Montgomery, Alabama 36109-0711 PROJECT: **Huntsville Readiness Center** Huntsville, AL In compliance with your Invitation for Bid, the undersigned hereby proposes to furnish the plant, labor, materials, and equipment and perform all work for the above described project in strict accordance with the specifications, drawings, and addenda number for consideration of the following prices (bid prices do NOT include Sales or Use Taxes in accordance with Act 2013-205): BID PERFORM ALL WORK IN ACCORDANCE WITH THE DRAWINGS & SPECIFICATIONS FOR: Huntsville Readiness Center, Huntsville, AL. Contractor shall be included in the Base Bid the following Aid to Construction Allowances per Specification Section 01 2100: Aid to Construction Allowance - Water/Sewer: \$225,000.00; Aid to Construction Allowance - Power: \$75,000.00; Aid to Construction Allowance - Gas: \$60,000.00; Aid to Construction Allowance - Bi-Directional Amplifier: \$125,000.00 **BASE BID** ALTERNATE BID ITEM #A-1 (PAVING MOV ACCESS ROAD) \$\_\_\_\_\_ **ALTERNATE BID ITEM #A-2 (LOADING RAMP)** ALTERNATE BID ITEM #A-3 (TRUCK CONTAINMENT PAD) \$\_\_\_\_\_ **UNIT PRICES (Refer to Specification Section 01 22 00)** \$\_\_\_\_\_ per cubic yard **UNIT PRICE NO. 1 (UNSUITABLE SOILS)** UNIT PRICE NO. 2 (8" ALDOT 825) **\$\_\_\_\_\_** per sq. yard **\$\_\_\_\_** per sq. yard **UNIT PRICE NO. 3 (HEAVY DUTY CONCRETE PAVING)** 

IFB # AC-25-B-0006-S

SECTION 00 41 00 – PROPOSAL FORM

PROPOSAL FORM 00 41 00-1

IFB # AC	-25-B-0006-S	
BIDDER		

**ESTIMATED SALES TAX AMOUNT** 

#### **ACCOUNTING OF SALES TAX**

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

BASE BID (Short Description)	\$
ALTERNATE BID ITEM #A-1 (PAVING MOV ACCESS ROAD)	\$
ALTERNATE BID ITEM #A-2 (LOADING RAMP)	\$
,	¢
ALTERNATE BID ITEM #A-3 (TRUCK CONTAINMENT PAD)	₹ <u></u>

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.

TIME LIMIT: These bids are subject to an acceptance period of thirty (30) days.

- A. All amounts and totals given will be subject to verification by the State. In case of variation between unit bid price and total shown by bidder, the unit price will be considered to be his bid. The State reserves the right to award the work on the basis of any bid or any combination of bids and to increase or decrease the quantities of any item listed in this bid at the price quoted for that particular item.
- B. Bids shall be for the entire work and shall have each blank space filled in to include the "Estimated Sales Tax Accounting".
- C. The quantities of each item of the bid as finally ascertained at the close of the contract will determine the total payment to accrue under the contract.
- D. The bidder, upon request of written notice of award of the contract within thirty (30) days after the date of opening of bids, agrees that he will execute the construction contract in accordance with this bid as accepted, and if the consideration of the contract will exceed \$100,000.00 in amount, will furnish to the State a Performance Bond and a Payment Bond on AGO Forms, with good and sufficient surety or sureties as required by the specifications, at the time the contract is executed.
- E. It is hereby warranted that in the event award is made to the undersigned, there will be furnished under this contract or used in the performance of the work covered by this contract, only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States, and only such manufactured articles, materials, or supplies mined, produced or manufactured, as the case may be, in the United States, except as indicated in the bid documents..

PROPOSAL FORM 00 41 00-2

IFB # AC-25-B-0	006-S
BIDDER	

F. The bidder further agrees that if awarded the contract, he will commence work within ten (10) calendar days after notice to proceed date and that he will fully complete the work ready for use not later than <a href="mailto:e10">610</a> calendar days after notice to proceed date.

FIRM NAME
ADDRESS
-
PHONE
FAX
EMAIL
BY
SIGNATURE
PRINTED NAME
TITLE
STATE OF ALABAMA CONTRACTOR'S LICENSE NO

#### NOTES:

All bidders must be licensed under the provisions of Title 34, Chapter 8, Code of Alabama, 1975, as amended.

On projects bid at \$100,000.00 or more, the bidder must include his license number on the bid form in the prescribed place and on the outside of the envelope containing the bid, or otherwise the bid will not be considered.

Bid Prices do not include Sales or Use Taxes but these taxes are identified in the Estimated Sales Tax Amount section of this bid form.

PROPOSAL FORM 00 41 00-3

#### SECTION 00 43 00 - FORM OF BID BOND

(Revised: 31 October 2024)

#### **BID BOND**

A completed/executed Standard Bid Bond form (Building Commission Form, AIA Form, GSA Standard Form, etc.) [A Power of Attorney is **REQUIRED** for all Bid Bonds] or a certified check made payable to the Armory Commission of Alabama in an amount not less than five (5) percent of the Contractor's bid, but in no event more than ten thousand dollars (\$10,000.00), must accompany all bids greater than \$100,000.00.

#### **END OF SECTION**

FORM OF BID BOND 00 43 00-1

# SECTION 00 43 25 - SUBSTITUTION REQUEST FORM DURING BIDDING (Revision Date - 14 Jan 21)

(BIDDERS SHALL USE THIS FORM FOR SUBMITTING SUBSTITUTION REQUESTS DURING BIDDING. OTHER FORMS OF SUBSTITUTION REQUESTS WILL NOT BE CONSIDERED. THIS FORM MUST BE RECEIVED BY ARCHITECT NOT LATER THAN 7 WORKING DAYS PRIOR TO BID OPENING DATE)

Project: Huntsville Readiness Center			Substitution Request Number:			
IFB Project N	lo.: AC-25-B-000	<b>06-S</b> Re:				
_						
					Saction	
-					_ Section: icle/Paragraph:	
Proposed			rage	AIL	icie/Paragrapii	
	<b>.</b>					
					Phone:	
Trade Name:				Mode	l No.:	
Installer:		Address:			Phone:	
History:	New Product	1 – 4 years old	5 – 10 year	s old	Exceeds 10 years ol	d
•	•	data attached – REC				
Similar Insta	llation:					
Project:			Architect:			
Address:			Owner:			
			Date Installed:			
		s other parts of Wo				
Savings to O	wner for accept	ing substitution (in	clude rough ord	ler of ma	ngnitude): \$	
		J (	<del></del>		J/- +	_
	bstitution chang		include rough o	order of r	magnitude):No	Yes
Supporting [	Data Attached:					
Drawings	Product Data	Samples	Tests Re	ports		_

The Undersigned Certifies:

Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.

Same warranty will be furnished for proposed substitution as for specified product.

Same maintenance service and source of replacement parts, as applicable, is available.

Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.

Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.

Proposed substitution does not affect dimensions and functional clearances.

Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Signed By:	
Fax:	
Website:	
	Fax:

# **SECTION 00 45 19 - DISCLOSURE STATEMENT**



# State of Alabama Disclosure Statement

(Required by Act 2001-955)

ENTITY COMPLETING FORM	
ADDRESS	
CITY, STATE, ZIP	TELEPHONE NUMBER
STATE AGENCY/DEPARTMENT THAT WILL RECEIVE GOODS, SERVICES, OR IS RESPONSIBLE FOR Armory Commission of Alabama	R GRANT AWARD
1720 Congressman W. L. Dickinson Drive	
Montgomery, AL 36109	(334) 271-7274
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 unit Agency/Department in the current or last fiscal year?  Yes  No  If yes, identify below the State Agency/Department that received the govided, and the amount received for the provision of such goods or service.	oods or services, the type(s) of goods or services previously pro-
STATE AGENCY/DEPARTMENT TYPE OF GOODS/	SERVICES AMOUNT RECEIVED
Have you or any of your partners, divisions, or any related business unit Agency/Department in the current or last fiscal year?  Yes No If yes, identify the State Agency/Department that awarded the grant, the STATE AGENCY/DEPARTMENT DATE GRANT AND DATE GRANT AN	e date such grant was awarded, and the amount of the grant.
List below the name(s) and address(es) of all public officials/public e any of your employees have a family relationship and who may dire Identify the State Department/Agency for which the public officials/pu	ctly personally benefit financially from the proposed transaction ublic employees work. (Attach additional sheets if necessary.)

#### **SECTION 00 45 19 - DISCLOSURE STATEMENT**

Notary's Signature

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 PUBLIC OFFICIAL/ STATE DEPARTMENT/ **FAMILY MEMBER ADDRESS** PUBLIC EMPLOYEE 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 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

2. List below the name(s) and address(es) of all family members of public officials/public employees with whom you, members of your

Act 2001-955 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.

Date

**Date Notary Expires** 

# 00 52 00 - CONSTRUCTION CONTRACT FORM

STATE:

# STATE OF ALABAMA

# THE ARMORY COMMISSION OF ALABAMA

# CONSTRUCTION CONTRACT

OWNER:	THE ARMORY COMMISSION OF ALABAMA P.O. BOX 3711 MONTGOMERY, ALABAMA 36109-0711
CONTRACTOR:	(Contractor's Name) (Street Address) (City, State Zip)
CONTRACT FOR:	(Project Name)
CONSTRUCTION LOCATION: AMOUNT:	(Project City, State) (Dollar Amount)
PAYMENT TO BE MADE BY:	STATE OF ALABAMA
FEDERAL:	

## CONTRACT AGREEMENT FOR CONSTRUCTION

THIS AGREEMENT, entered into this (day) day of (month) (year) by and between The Armory Commission of Alabama (hereinafter called the Owner), and (Contractor Name) (hereinafter called the Contractor).

WITNESSETH that the Owner and the Contractor, in consideration of premises of the mutual covenants, considerations, and agreements herein contained, agree as follows:

STATEMENT OF WORK: The Contractor shall furnish all labor and materials and perform all work for (**Project Name**) in strict and entire conformity with the plans and specifications dated (**Date**) prepared by (**Architect/Engineer**) and approved by The Armory Commission, including Addenda thereto numbered (**Number**), all of which are hereby made a part of this agreement as fully and to the same effect as if the same had been set forth at length in the body of this Agreement.

TIME OF COMPLETION: The work shall be commenced on a date to be specified in a written proceed order of the Contracting Officer and shall be completed within (# of Days) from and after said date as provided in the Contract documents.

#### 00 52 00 - CONSTRUCTION CONTRACT FORM

COMPENSATION TO BE PAID: The Owner will pay and the Contractor will accept in full consideration for the performance of the Work, subject to additions and deductions (including liquidated damages) as provided in the Contract Documents, the sum of (Contract Amount), being the amount of the Contractor's bid for the aforesaid work, including bid items (Awarded Items). The Contractor and the Owner for themselves, their successors, executors, administrators, and assigns, hereby agree to the full performance of the covenants herein contained.

COMPLIANCE WITH ADDITIONAL STATE REQUIRED CLAUSES: By signing this contract, the Contractor hereby certifies compliance and agreement with the following clauses required by the State of Alabama:

- 1. In compliance with Act No. 2012-491, 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;
- 2. In compliance with Act 2016-312, the Contractor hereby certifies that it is 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;
- 3. In compliance with the merit system exclusion clause, the Contractor understands

### CONTRACT NO. AC-XX -C-00XX-S

#### 00 52 00 - CONSTRUCTION CONTRACT FORM

and agrees that the Contractor is not to be considered a State of Alabama merit system employee and is not entitled to any benefits of the State Merit System;

4. By entering into this contract, the Contractor is not an agent of the state, its officers, employees, agents or assigns. The Contractor is an independent entity from the State and nothing in this agreement creates an agency relationship between the parties.

IN WITNESS WHEREOF, the Parties hereto and on the day and year first above written have executed this Agreement in Three counterparts, each of which shall without proof or accounting for the other counterparts, be deemed as original thereof.

This Contract was let in accordance with the provisions of Title 39, Code of Alabama 1975 as amended, and applicable sections of Department of Defense Armed Services Procurement Regulation. The terms and commitments of this 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.

# CONTRACT NO. AC-XX -C-00XX-S

#### 00 52 00 - CONSTRUCTION CONTRACT FORM

WITNESSES:	CONTRACTING PARTIES:
	(Contractor's Name) Contractor
	(Signature)
This contract has been reviewed for legal rules, and regulations of the State of Alabar	form and complies with all applicable laws, na governing these matters.
	JAMES R. HOUTS Deputy Attorney General
This contract has been reviewed for and is a	approved as to content.
	MARK A. WEEKS State Property & Disbursing Officer

<u>NOTE</u>: If the Contractor is a corporation, witnesses are not required, but the annexed certificate must be completed. Type or print names under all signatures.

### CONTRACT NO. $\underline{AC-XX-C-00XX-S}$

### 00 52 00 - CONSTRUCTION CONTRACT FORM

ATTEST:	The Armory Commission of Alabama		
MARK A. WEEKS Secretary The Armory Commission	SHERYL E. GORDON Major General, ALNG The Adjutant General		
ATTEST:	APPROVED:		
JOHN H. MERRILL Secretary of State of Alabama	KAY IVEY Governor, State of Alabama		

### 00 52 00 - CONSTRUCTION CONTRACT FORM

### CERTIFICATE

I,, certify that I am	the	_ of the corporation
named as Contractor herein; thatxxxx	xxxxxx., who signed	this contract on
behalf of the Contractor, was then the	xxxxxxxxx of said cor	poration; that said
Contractor was duly signed for and in beh	alf of said corporation by	authority of its
governing body, and is within the scope of	f its corporate powers.	
(SEAL)		

NOTE: Contractor, if a corporation, should cause the above certificate to be executed under its corporate seal. THE SAME OFFICER SHALL NOT EXECUTE BOTH THE CONTRACT AND THE CERTIFICATE.

<u>NOTE</u>: In the event that the Contractor is not a corporation, the signature page must be witnessed by two individuals and this page may be left blank.

### **SECTION 00 61 13 - PERFORMANCE BOND FORM**

AGO Form 215 PERFORMAN (16 Apr 80) (MOD JUL 87) (See Instruction	
(Page 1 of 3) PRINCIPAL (Legal name and business address)	TYPE OF ORGANIZATION  ("X" Out)  Individual Partnership Joint Venture Corporation State of Incorporation
SURETY(IES) (Name and business address)	
Penal Sum of Bond (Express in words & figures)	
Contract Number	Contract Date
bound to the Armory Commission of Alabama in bind ourselves, our heirs, executors, administrators. That, where the Sureties are corporations acting as sum "jointly and severally" as well as "severally" actions against any or all of us, and for all other pur with the Principal, for the payment of such sum on but if no limit of liability is indicated, the limit of lia	we, the Principal and Surety(ies) hereto, are firmly the above penal sum for the payment of which we s, and successors, jointly and severally: <i>Provided</i> , co-sureties, we, the Sureties, bind ourselves in such only for the purpose of allowing a joint action or poses each Surety binds itself, jointly and severally ly as is set forth opposite the name of such Surety, ability shall be the full amount of the penal sum.
NOW, THEREFORE, if the Principal shall:	
said contract during the original term of said contr by the Armory Commission of Alabama through it Surety(ies), and during the life of any guaranty req fulfill all the undertakings, covenants, terms, condit	s, covenants, terms, conditions, and agreements of act and any extensions thereof that may be granted as Contracting Officer, with or without notice to the uired under the contract, and shall also perform and ions, and agreements of any and all duly authorized r be made, notice of which modifications to the

AGO Form 215 (16 Apr 80) (Page 2 of 3) (MOD Jul 87)

> (b) PROVIDED, further, that upon the failure of the said PRINCIPAL to promptly and efficiently prosecute said Work, in any respect, in accordance with the Contract Documents, the above bound Surety(ies) shall take charge of said work and complete the Contract at his/their own expense, pursuant to its terms, receiving, however, any balance of the funds in the hands of said The Armory Commission of Alabama due under said contract.

SS&L# 21112

- (c) The Invitation for Bids, Instructions to Bidders, Proposal, General and Special Conditions of the Contract, Detailed Specification Requirements, and Drawings, and the Contract Agreement hereinbefore referred to, and the Bond for the Payment of Labor, Materials, Food-stuffs, or Supplies executed under the provision of Chapter 1, Title 39, Alabama Code of 1975, are made a part of this obligation, and this instrument is to be construed in connection therewith.
- (d) If the said contract is subject to the Miller Act, as amended (40 U.S. Code 270a-270e), pay to the U.S. of America the full amount of the taxes imposed by the U.S. Government which are collected, deducted, or withheld from wages paid by the Principal in carrying out the construction contract with respect to which this bond is furnished; then the above obligation shall be void and of no effect.

		te set forth above	ipal and Surety(ies) have	e executed tims j	performance bond and	Have affixed	
			PRINCIP	AL			
Sig	natures(s)	1.	(Scal)	2.	(Seal)	Corporate	
	me(s) & Fitle(s) Types)					Seal	
		W	CORPORATE SU	RETY(IES)			
Sign Nam	Name & Address (Typed)			te of Inc.	Liability Limit		
	Signature(	s) 1.	2.		110	Corporate Seal	
	Names(s) (Title(s) (Typed)		2.				
Surety B	Name & Address (Typed)		Stat	te of Inc.	Liability Limit		
	Signature(	s) 1.	2.			Corporate Seal	
	Names(s) Title(s) (Typed)		2.				
	p	Bond	Rate Per Tho	usand	Total		

AGO Form 215 (16 Apr 80) (Page 3 of 3) (MOD JUL 87) INSTRUCTIONS

- This form is authorized for use in connection with contracts for construction work or the furnishing of supplies or services. There shall be no deviation from this form without approval by the Armory Commission of Alabama.
- 2. The full legal name and business address of the Principal shall be inserted in the space designated "Principal" on the second page of this form. The bond shall be signed by an authorized person. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of his authority must be furnished.
- 3. Corporations executing the bond as sureties must be licensed to do business in the State of Alabama. Where more than a single corporate surety is involved, their names and addressed (city and state) shall be inserted in the spaces (Surety A, Surety B) headed "CORPORATE SUETY(IES)", and in the space designated "SURETY(IES)" on the front page of this form, only the letter identification of the Sureties shall be inserted. Evidence of authority must be attached.
- Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Seal".
- 5. The name of each person signing this performance bond should be typed in the space provided.

**END OF SECTION** 

#### **SECTION 00 61 16 - PAYMENT BOND FORM**

AGO Form 214 5 AUG 82 (MOD 29 JU	PAYMENT BOND	Date bond executed
Page 1 of 2	(See Instructions Attach	ed)
	me and business address)	TYPE OF ORGANIZATION  ("X" Out)  Individual  Partnership  Joint Venture  Corporation  State of Incorporation
SURETY (IES) (Name	and Business Address)	
Penal Sum of Bond (Ex	press in words & figures)	
nazvonen eromerou stassus	- i	
Contract No.:		Contract Date:

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal and Surety(ies) hereto, are firmly bound to the Armory Commission of Alabama in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally: Provided, That, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal entered into the contract identified above:

NOW, THEREFORE, if the Principal shall promptly make payment to all persons supplying labor, equipment or supplies, and material in the prosecution of the work provided for in said contract and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the Surety(ies) being hereby waived, then the above obligation shall be void and of no effect; otherwise to remain and be in full force and effect.

PROVIDED, further, in the event that the said Principal, as such Contractor, shall fail to make prompt payment to all persons supplying him or them with labor, materials, feed-stuffs, or supplies for or in the prosecution of the Work provided for in such Contract, the above bound Surety(ies) shall be liable for the payment of reasonable attorney's fees incurred by successful claimants or plaintiffs in suits on said bond as provided in Chapter 1, Title 39, Code of Alabama 1975.

PROVIDED, further, that said Principal and Surety hereby agree and bind themselves to the mode of service described in Chapter 1, Title 39, Code of Alabama 1975, and consent that such service shall be the same as personal service on said Principal or Surety.

		REOF, the Principal and Surety(ies set forth above.		s payment bone	I and have affixed
		PRINCI	The state of the s		
	ature(s)	1. (Scal)	2.	(Seal)	Corporate
Nam Title (Typ				o NP (Pressyde)	Seal
		CORPORATE S	URETY(IES)	100	
Surety A	Name & Address (Typed)	1000 350 1000 440 200 400 400 400 400 400 400 400	State of Inc.	Liability Limit	
	Signature(s)	1.	2.		Corporate Seal
	Name(s) & Title(s) (Typed)	1.	2.		
Surety B	Name & Address (Typed)		State of Inc.	Liability Limit	
	Signature(s)	1.	2.	.EC	Corporate Seal
	Name(s) & Title(s) (Typed)	1.	2.		

### INSTRUCTIONS

- This form, for the protection of persons supplying labor and material, shall be used whenever a
  payment bond is required under the act of Aug 24, 1935, 49 Stat. 793, as amended (40 U.S.C.
  270a-270e). There shall be no deviation from this form without approval by the Armory
  Commission of Alabama.
- 2. The full legal name and business address of the Principal shall be inserted on the space designated "Principal" on this form. The bond shall be signed by an authorized person. Where such person is signing in a representative capacity (e.g. an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of his authority must be furnished.
- 3. Corporations executing the bond as sureties must be licensed to do business in the State of Alabama. Where more than a single corporate surety is involved, their names and addresses (city and state) shall be inserted in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)", and in the space of the Sureties shall be inserted. Evidence of authority must be attached.
- Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Seal".
- The name of each person signing this payment bond should be typed in the space provided.

#### **END OF SECTION**

### **CONTRACTORS PERIODICAL REQUEST FOR PARTIAL PAYMENT (Rev 12 MAR 2019)**

PROJECT TITLE:	LOCATION:				
CONTRACT NUMBER:					
OWNER: THE ARMORY COMMISSION			/, AL 36109		
CONTRACTOR:					
ADDRESS:					
PARTIAL PAYMENT NO.	FINAL Pay Req? Yes	/ No PERIO			
Item # Description		Contract Price	Percent Complete	Amount Complete	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11 12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
		*		**	
TOTAL ORIGINAL CONTRACT Net Total of ALL	1	\$0.00		\$0.00	
Change Orders/Supplements No.	to				
TOTAL CONTRACT TO DATE	.0	\$0.00		\$0.00	
I DAIL		ψ0.00	1	ψ5.00	

Page: 1 of 2

Brought Forward TOTAL CONTRACT TO DATE \$ 0.00	1	\$0.00
	% Completed	
Stored Materials: (List)		
Amount of Stored Materials (*)	\$0.00	\$0.00
Total Completed & Stored Materials		\$0.00
Less Retainage (5% up to 50% of Contract Amount)		\$0.00
Total Due		\$0.00
		\$0.00
Total Previous Payments		
BALANCE DUE THIS PAYMENT		\$0.00
Sworn to and subscribed before me this		
	CONTRACTOR	
	CONTRACTOR	
day of 20	CONTRACTOR	
day of 20 (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)	CONTRACTOR  (Signature)	
day of 20 (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:		
day of 20 (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:		
day of 20 (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY: (Notary Public)  Printed Name:  My Commission Expires: Title:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:  VERIFICATIONS AND APPROVALS  Checked by: Date:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:  VERIFICATIONS AND APPROVALS  Checked by: Date:  Architect/Architect's Representative		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:  VERIFICATIONS AND APPROVALS  Checked by: Date:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:  VERIFICATIONS AND APPROVALS  Checked by: Date:  Reviewed by: Date:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:  VERIFICATIONS AND APPROVALS  Checked by: Date:  Reviewed by: Date:		
day of 20  (Do NOT Type Above Information - Handwritten Date Info ONLY)  BY:  (Notary Public)  Printed Name:  My Commission Expires: Title:  VERIFICATIONS AND APPROVALS  Checked by: Date:  Reviewed by: Date:		

(Rev 12 MAR 2019) Page: 2 of 2

### CHANGE ORDERDETAIL SHEET

## FOR PARTIAL PAY REQUEST NO.

CO#	Description	Contract Price	Percent Complete	Amount Complete
Ne	t Total of ALL Change			
Orders	s/Contract Mods FROM # TO #	\$0.00		\$0.00
<u> </u>		<u> </u>		

Page:  $\frac{1}{006276-3}$ 



# THE ARMORY COMMISSION OF ALABAMA

P.O. Box 3711 MONTGOMERY, ALABAMA 36109-0711

State Property and Disbursing Office

May 27, 2014

MEMORANDUM FOR ALL Architect-Engineer Firms Preparing Bid Documents for Armory Commission of Alabama and ALL Project Managers

SUBJECT: Act 2013-205, Certificate of Exemption from Sales and Use Tax for Armory Commission Contracts

- 1. Act 2013-205 was signed into law on May 9,2013, granting the Alabama Department of Revenue (ADOR) the authority to issue certificates of exemption from sales and use taxes for construction projects for certain governmental agencies. Enclosed are a Memo from Alabama Department of Revenue regarding the Sales Tax Exemption guidance and a copy of Act 2013-205.
- 2. A brief summary of Act 2013-205 as it pertains to Armory Commission Contracts is provided below:
  - a. ADOR shall issue certificates of exemption from sales and use tax to The Armory Commission of Alabama for each tax exempt project. The Armory Commission shall apply for certificates of exemption for each project. The contractor must also apply for certificates of exemption for each project for which they receive a contract.
  - b. Certificates of exemption shall only be issued for contracts entered into (awarded) on or after 1JAN14.
  - c. Certificates shall only be issued to contractors licensed by the State Licensing Board for General Contractors or any subcontractor working under the same contract.
  - d. Items eligible for exemption from sales and use tax are building materials, construction materials and supplies and other tangible personal property that become part of the structure per the written construction contract.
  - e. ADOR will handle the administration of certificates of exemption and the accounting of exempt purchases. ADOR will have the ability to levy fines and may bar the issuance or use of certificates of exemption upon determination of willful misuse by the contractor or a subcontractor.
  - f. The contractor shall account for the tax savings on the bid form by providing the estimated sales taxes for each item in the appropriate area on the bid form.
- 3. Contractors will NOT include sales taxes in their bids on the bid proposal form. Contractors <u>MUST</u> however include the estimated sales taxes for each listed bid item in the area identified on their bid proposal forms. This "accounting" for sales tax on the bid proposal form is required by Act 2013-205, Section 1 (g). Bid proposal forms with base bids and separate alternate bids will follow this procedure. The bid forms shall be modified for each project by the architect or engineer as appropriate to insure that EACH bid item is listed with NO sales taxes and then a separate area identifying the

estimated sales taxes for EACH of these items is identified and listed on the bid proposal form.

- 4. Failure of the contractor to complete the attachment to the bid proposal form indicating the sales tax as required by Act 2013-205, Section 1 (g) shall render the bid non-responsive.
- 5. Architects will address these tax reporting requirements in all future pre-bid conferences and will further prepare addenda which will inform all current plan holders of this tax exemption policy for the upcoming bid openings in June 2014.
- 6. It is the responsibility of the "contractor" to ensure they comply with Act 2013-205.
- 7. All future projects will include this information in the Instructions to Bidders. Should you have additional questions or need further information, please contact me by email mark.a.weeks3.nfg@mail.mil or phone (334) 271-7275.

Respectfully,

Enclosures

MARK A. WEEKS
Contracting Officer and Secretary,
The Armory Commission of Alabama

SALES TAX ABATEMENT 00 62 77 – 2



# State of Alabama Department of Revenue

(www.revenue.alabama.gov) 50 North Ripley Street Montgomery, Alabama 36132 MICHAEL E. MASON Assistant Commissioner IOE W. GARRETT. IR.

CURTIS E. STEWART

# 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 <a href="http://revenue.alabama.gov/salestax/ST-EXC-01.pdf">http://revenue.alabama.gov/salestax/ST-EXC-01.pdf</a>. 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 (<a href="https://myalabamataxes.alabama.gov">https://myalabamataxes.alabama.gov</a>).

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 <a href="mailto:Thomas.Sims@revenue.alabama.gov">Thomas.Sims@revenue.alabama.gov</a>.

# ACT 2013 - <u>205</u>

- 1 HB419
- 2 150466-6
- 3 By Representative DeMarco
- 4 RFD: Ways and Means Education
- 5 First Read: 07-MAR-13



1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

### ENROLLED, An Act,

Relating to construction projects of the State of Alabama, counties, municipalities, local boards of education, industrial development boards, and other governmental entities which are exempt from the payment of sales and use taxes on the purchase of building materials and construction materials to be included in construction projects of the governmental entity; to provide for the Department of Revenue to grant certificates of exemption from sales and use taxes to contractors and subcontractors licensed by the State Licensing Board for General Contractors for the purchase of building materials and construction materials to be used in the construction of a building or other project for the governmental entity, with the exception of any highway, road, or bridge project; to provide for accounting for purchases and enforcement for violation of the act; and to authorize the Department of Revenue to adopt rules to implement the act. BE IT ENACTED BY THE LEGISLATURE OF ALABAMA:

Section 1. (a) For the purposes of this act, the term "governmental entity" means any governmental entity or a political subdivision, department, or agency of a governmental entity or a board, commission, or authority of a governmental entity which is tax exempt from sales and use taxes by virtue of its governmental status, including, but not limited to, all

1	of the following: The State of Alabama, a county, a
2	municipality, an industrial or economic development board or
3	authority, and an educational institution of any of the
4	foregoing including a public college or university, a county
5	term "governmental entity" means the State of Alabama and its
6	political subdivisions, including a county, a municipality,
7	and an industrial or economic development board or authority.
8	A governmental entity shall also include an educational
9	institution of any of the foregoing Alabama political
10	subdivisions including a public college or university, a
11	county or city board of education, and the State Board of
12	Education.
13	(b) (1) The Department of Revenue shall issue a
14	certificate of exemption to the governmental entity for each
15	tax exempt project.
16	(b) (2) The Department of Revenue shall grant a
17	certificate of exemption from state and local sales and use

(b) (2) The Department of Revenue shall grant a certificate of exemption from state and local sales and use taxes to any contractor licensed by the State Licensing Board for General Contractors, or any subcontractor working under the same contract, for the purchase of building materials, construction materials and supplies, and other tangible personal property that becomes part of the structure that is the subject of a written contract for the construction of a building or other project, not to include any contract for the construction of any highway, road, or bridge, for and on

behalf of a governmental entity which is exempt from the
payment of sales and use taxes.

- (c) The use of a certificate of exemption for the purchase of tangible personal property pursuant to this section shall include only tangible personal property that becomes part of the structure that is the subject of the construction contract. Any contractor or subcontractor purchasing any tangible personal property pursuant to a certificate of exemption shall maintain an accurate cost accounting of the purchase and use of the property in the construction of the project.
- (d) A contractor who has an exemption from sales and use tax for the purchase of materials to use on a government project shall file, in a manner as prescribed by the department, an annual report reports of all exempt purchases. The annual report reports shall be filed as a prerequisite to renewal of a certificate of exemption.
- (e) (1) The department may assess any contractor or subcontractor with state and local sales or use taxes on any item purchased with a certificate of exemption not properly accounted for and reported as required.
- (2) Any contractor or subcontractor who intentionally uses a certificate of exemption in violation of this act shall, in addition to the actual sales or use tax liability due, be subject to a civil penalty levied by the

**HB419** 

department in the amount of not less than a minimum of two
thousand dollars (\$2,000) or two times any state and local
sales or use tax due for the property and, based on the
contractor's or subcontractor's willful misuse of the
certificate of exemption, may be barred from the use of any
certificate of exemption on any project for up to two years.

- (f) The department may adopt rules to implement this act in order to effectuate the purposes of this act and to provide for accurate accounting and enforcement of this act.
- (g) In bidding the work on a tax exempt project, the bid form shall provide for an accounting for the tax savings.
- (h) The intent of this act is to lower the administrative cost for the governmental entity, contractor, and subcontractor for public works projects. It is not the intent of this act to change the basis for determining professional services from fair market value, which may include sales and use taxes.

Section 2. This act shall be operative for contracts entered into October 1, 2013 January 1, 2014, or thereafter, and shall not apply to any contract entered into prior to January 1, 2014. In addition, this act shall not apply to any contract change orders or contract extensions, including revised, renegotiated, or altered contracts, when the original contract was entered into prior to January 1, 2014. The

### HB419

1	Department of Revenue may adopt rules to implement this act
2	after the effective date of this act.
3	Section 3. All laws or parts of laws which conflict
4	with this act are repealed.
5	Section 4. This act shall become effective October
6	1, 2013, following its passage and approval by the Governor,
7	or its otherwise becoming law.

1			
2			
3			
4		Speaker of the House of Re	presentatives
		111	
5		Kay I vey	
6	P	resident and Presiding Offi	cer of the Senate
7		House of Representati	ves
8 9 L0	I h and was passe	ereby certify that the with d by the House 09-APR-13, a	in Act originated in s amended.
11 12 13		Jeff Wooda Clerk	rd
4	<u>-</u>		
15	Senate _	07-MAY-13	Amended and Passed
6	Ноисе	00-M7V-13	Concurred in Sen-

09-MAY-13

APPROVED TIME

Alabama Secretary Of State

ate Amendment

Act Num...: 2013-205 Bill Num...: H-419

09:48amSLF Recv'd 05/10/13

Page 6

16

17

House

SECTION C OF ACT NO. 81-889 HEREBY CERTIFY THAT THE RESOLUTION AS REQUIRED IN

I HEREBY CERTIFY THAT THE NOTICE & PROOF IS ATTACHED AS REQUIRED IN THE GENERAL ACTS OF ALABAMA, 1975 ACT NO. TO THE BILL, H.B.

JEFF WOODARD, Clerk

CONFERENCE COMMITTEE

House Conferees

I hereby certify that the Resolution as required in Section C of Act No. 81-889 was adopted and is attached to the Bill, HB

YEAS

NAYS

PATRICK HARRIS, Secretary

HOUSE ACTION

207

SENATE ACTION

11-1

DATE:

**RD 1 RFD** 

WAS ADOPTED AND IS ATTACHED TO THE BILL, H.B. 419

NAYS 6 YEAS OH

This Bill was referred to the Standing

Committee of the Senate on

and was acted upon by such Committee in session and is by order of the Committee returned therefrom with a favorable report by a vote of

qns/m

w/amend(s)

abstain (

nays

yeas

Chairperson

20 13

JEFF WOODARD, Clerk

RD 2 CAL DATE: RF

20\_\_\_

RE-COMMITTED

RE-REFERRED

DATE

Committee

### 00 62 78 INVENTORY OF STORED MATERIALS

### **INVENTORY OF STORED MATERIALS**

Project:			For Pe	riod Ending	
Contractor:					
A	В	С	D	E	F
D EG CD YDEY CAY	A CAMPEDYAY O	DATE CALL CED	mom . x	> * + ===== * + * * *	3.5.4 (2) (2) (3)

A	В	С	D	Е	F
DESCRIPTION	MATERIALS STORED LAST PERIOD	PURCHASED THIS PERIOD	TOTAL COLUMNS B + C	MATERIALS USED THIS PERIOD	MATERIALS PRESENTLY STORED

To be used as documentation to support value of Stored Materials reported on CONTRACTOR'S PERIODICAL REQUEST FOR PARTIAL PAYMENT.

rage 01	Page	of	
---------	------	----	--

### 00 62 78 INVENTORY OF STORED MATERIALS

### **INVENTORY OF STORED MATERIALS**

Project:			For Pe	riod Ending	
Contractor:					
A	В	С	D	E	F
D EG CD YDEY CAY	A CAMPEDYAY O	DATE CALL CED	mom . x	> * + ===== * + * * *	3.5.4 (2) (2) (3)

A	В	С	D	Е	F
DESCRIPTION	MATERIALS STORED LAST PERIOD	PURCHASED THIS PERIOD	TOTAL COLUMNS B + C	MATERIALS USED THIS PERIOD	MATERIALS PRESENTLY STORED

To be used as documentation to support value of Stored Materials reported on CONTRACTOR'S PERIODICAL REQUEST FOR PARTIAL PAYMENT.

rage 01	Page	of	
---------	------	----	--

### 00 62 83 CONTRACTOR'S DRAW SCHEDULE

	Date Prepared:
Project Name:	
Contract Number:	
Contractor:	
Architect/Engineer:	

This draw schedule is to be updated monthly and the most current version <u>MUST</u> be submitted with each Contractor's Periodical Request for Partial Payment.

CURRENT MONTH/YEAR						
PROJECTED DRAW						
ACTUAL DRAW						
TOTAL AMOUNT OF DRAWS	0	0	0	0	0	0
CURRENT MONTH/YEAR						
PROJECTED DRAW						
ACTUAL DRAW						
TOTAL AMOUNT OF DRAWS	0	0	0	0	0	0
CURRENT MONTH/YEAR						
PROJECTED DRAW						
ACTUAL DRAW						
TOTAL AMOUNT OF DRAWS	0	0	0	0	0	0
CURRENT MONTH/YEAR						
PROJECTED DRAW						
ACTUAL DRAW						
TOTAL AMOUNT OF DRAWS	0	0	0	0	0	0

## 00 63 56 - WEATHER DELAY DOCUMENTATION FORM (Revised 3 August 2021)

<b>To: Seay Seay o</b> 1115 South ( Montgomer P: (334) 263- F: (334) 263-	Court Stre y, AL 3610 5162	et					Contro Contro Contro	actor No actor A actor C actor Ph actor Fo	<mark>ddress</mark> ity, State none	; Zip	
PROJECT: (Name and address)		ntsville R ntsville, A		ss Center	. (	CONTR/	ACT NO	•	AC(	C-0S	
TO OWNER: (Name and address)	Ala 172	_	. W. L Di	n of ickinson [ pama 361	I Dr.	date oi Issuanc					
NOTICE OF Y				Year):							
This Monthly present a C									oject in o	order to f	ormally
The table be exterior wor location for	k and is b	ased up									
MONTHLY A	NTICIPATE	ED ADVE	ERSE RA	IN (in day	/s) – C	CALENDA	AR DAY	S			
JAN FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Based on th adverse we			_	•			•		monthly	v anticipa	ted
From our Do Project expe work. The to this Project s be extende	erienced otal numb site for this	days er of ac month	of adveduerse of by _ d	erse wea days, of _	ther re _ day	esulting s excee	in a pa ds the i	rtial or c normal	complete adverse	e stoppag weather	ge of days at
TOTAL NET C	DAYS REQI	JESTED I	FOR	(Mor	nth) O	F <u>20</u>	(Year)				
TOTAL NET D	AYS REQI	JESTED I	FOR PRO	OJECT TO	DATE	:	(Days)				
TOTAL NET D	DAYS APPF	ROVED I	BY OWN	IER FOR F	PROJE	CT TO E	ATE: _	(D	ays)		
NOTE: The p	urpose of	this form	n is to d	locumen	t Adva	erse We	ather D	avs dur	ing the c	ourse of	the

Project. It does not relieve the Contractor of his responsibility to complete the Project in a timely

manner and as scheduled.

## FORM OF ADVERTISEMENT OF COMPLETION

### **LEGAL NOTICE**

In accordance with Chapter	r 1, Title 39, Code of Alabama,
1975, notice is hereby given that	t <u>Contractor</u> has completed
the Contract for Project	Name),
located at <u>City, State</u> , for t	the Armory Commission of Alabama,
Owner, and have made request for f	inal settlement of said Contract. All
persons having any claim for	labor, materials or otherwise in
connection with this project shou	ld immediately notify the Armory
Commission of Alabama, P.O.	Box 3711, Montgomery, Alabama
36109-0711.	
	Contractor
	<b>Business Address</b>

NOTE: This notice must be run once a week for four successive weeks. Proof of publication is required.

### **CERTIFICATE OF PUBLICATION**

### **STATE OF ALABAMA**

COUNTY OF		
Before me,		, a Notary Public, in
and for said County, personally appeared		
who duly sworn, deposes and says that he	e/she is the <b>PUBLISHEF</b>	R of the
·	a newspaper published	d weekly in
Cour	nty, Alabama, and that	the
- <del></del>		
a copy of which is attached hereto, was publis	shed in said newspaper f	or consecutive weeks
commencing in the issue of		(date), and ending in the issue of
	(date).	
	Publi	sher
Sworn to and subscribed before me this	day of	
	Nota	ry Public

PROJECT: (Name and address)



# Contractor's Affidavit of Payment of Debts and Claims

ARCHITECT'S PROJECT NUMBER:

x TO OW	NER: (Name and address)	00000-00 CONTRACT FOR: General CONTRACT DATED: January		ARCHITECT:  CONTRACTOR:  SURETY:  OTHER:
STATE				
otherwi for all k the perf	se been satisfied for all mater mown indebtedness and claim	ials and equipment furnish s against the Contractor fo	ayment has been made in full and all ed, for all work, labor, and services or damages arising in any manner in Owner or Owner's property might	performed, and connection with
EXCEPT	FIONS:			
1.	RTING DOCUMENTS ATT. Consent of Surety to Final P Surety is involved, Consent required. AIA Document G Surety, may be used for this e Attachment	ayment. Whenever of Surety is 707, Consent of	CONTRACTOR: (Name and addre	ess)
Tl L-11	(t	-11-1	BY:	
	owing supporting documents . f required by the Owner:	snouta de attachea	(Signature of authorized re	epresentative)
1.	Contractor's Release or Wai conditional upon receipt of f		(Printed name and title)	
2.	Separate Releases or Waiver Subcontractors and material suppliers, to the extent requi accompanied by a list thereo	and equipment red by the Owner,	Subscribed and sworn to before m	ne on this date:
3.	Contractor's Affidavit of Re (AIA Document G706A).	lease of Liens	Notary Public: My Commission Expires:	

AlA Document G706™ – 1994. Copyright © 1970 and 1994 by The American Institute of Architects. All rights reserved. WARNING: This AlA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AlA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AlA software at 14:45:45 on 09/09/2010 under Order No.7824242228\_1 which expires on 04/21/2011, and is not for resale.

User Notes: (1967998544)

OWNER:



## Contractor's Affidavit of Release of Liens

PROJECT: (Name and address) x  TO OWNER: (Name and address)	ARCHITECT'S PROJECT 00000-00 CONTRACT FOR: Gener Construction CONTRACT DATED: Jan	al ARCHITECT: CONTRACTOR:
STATE OF: COUNTY OF:		
listed below, the Releases or Waivers of materials and equipment, and all pe	of Lien attached hereto inclerformers of Work, labor or encumbrances against	ed's knowledge, information and belief, except as ude the Contractor, all Subcontractors, all suppliers services who have or may have liens or any property of the Owner arising in any manner
EXCEPTIONS:		
SUPPORTING DOCUMENTS ATTA  1. Contractor's Release or Waiv conditional upon receipt of fi	ver of Liens,	CONTRACTOR: (Name and address)
2. Separate Releases or Waivers Subcontractors and material a		BY:
suppliers, to the extent requir accompanied by a list thereof	red by the Owner,	(Signature of authorized representative)
		(Printed name and title)
	S	Subscribed and sworn to before me on this date:
	ז	Notary Public:

AIA Document G706A<sup>TM</sup> – 1994. Copyright © 1982 and 1994 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 14:46:40 on 09/09/2010 under Order No.7824242228\_1 which expires on 04/21/2011, and is not for resale.

User Notes: (1346915960)

My Commission Expires:



# Consent Of Surety to Final Payment

PRO	JECT: (Name and address)	ARCHITECT'S PROJECT NUMBER: 00000-00	OWNER:
X		CONTRACT FOR: General Construction	ARCHITECT: □
TOO	WMED: (Name and address)	CONTRACT DATED: January 07, 2005	CONTRACTOR:
100	OWNER: (Name and address)	CONTRACT DATED. January 07, 2003	SURETY:
			OTHER:
	ecordance with the provisions of the Contract name and address of Surety)	ract between the Owner and the Contractor as indicated above, the	
	ond of ert name and address of Contractor)		, SURETY,
Sure	by approves of the final payment to the Co ty of any of its obligations to ert name and address of Owner)	ontractor, and agrees that final payment to the Contractor shall not	CONTRACTOR, relieve the
as se	t forth in said Surety's bond.		, OWNER,
	VITNESS WHEREOF, the Surety has her ert in writing the month followed by the m		
		(Surety)	
		(Signature of authorized representative	e)
Attes		(Printed name and title)	
1.\001	/1°	(Printed name and fitte)	

# 00 65 20 – CERTIFICATE OF FINAL COMPLETION FORM (Revised 3 August 2021)

CERTIFICATE OF FINAL COMPLETION

Seay Seay and Li 1115 South Court Montgomery, AL P: (334) 263-5162 F: (334) 263-5170	Street	OWNER ARCHITECT CONTRACT OTHER	OR 🖂			
PROJECT: (Name and address)	Huntsville Readiness Center Huntsville, AL	CONTRACT NO.	ACCS			
TO OWNER: (Name and address)	Armory Commission of Alabama 1720 Cong. W. L Dickinson Dr. Montgomery, Alabama 36109	TO CONTRACTOR: (Name and address)	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
DATE OF ISSUANCE:	DATE	CONTRACT TYPE: CONTRACT DATE:	General Construction MONTH DAY, YEAR			
	IGNATED PORTION SHALL INCLUE he Huntsville Readiness Center Ic	· <del>- ·</del>	L.			
knowledge, infor the Work when the Contract Docum Final Completion the Owner as sta	The Work performed under this Contract has been reviewed and found, to the Architect's best knowledge, information and belief, to be complete. Final Completion is the stage in the progress of the Work when the Work or designated portion thereof is complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. The Date of Final Completion of the Project designated above is hereby established as the date of execution by the Owner as stated in the General Conditions, which is also the date of commencement of applicable warranties required by the Contract Documents.					
The project is her	eby certified by the Architect as	completed.				
Seay Seay and L	itchfield, P.C.					
Architect:	By: NAME		Date:			
Contractor Name						
Contractor:	By: NAME (FI	ROM CONTRACT)	Date:			
The Owner acce	pts the Work as complete and w	rill assume full possession	on thereof at TIME on DATE.			
Armory Commiss	ion of Alabama					
Owner:	By: AC Repre	esentative Name	Date:			

Distribution to:

Date of Acceptance:

Date of Expiration:

GENERAL CONTRACTOR'S	B. C. Project No.
ROOFING GUARANTEE	

Project Name & Address	Project Owner(s) &	& Address
General Contractor's Name, Address, & Telephone Num	iber	EFFECTIVE DATES OF GUARANTEE

- 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 manufacturer's 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, 20		strumen	t has	been	duly	executed	this	 	day of
	Ganaral Ca	ontractor's A	uthorizo	d Signat							
	General Co	muacioi s A	uunonze	u Signai	ure						
	Tyr	ped Name an	d Title								

#### GENERAL CONDITIONS OF THE CONTRACT

#### **CONTENTS**

#### Paragraph No.

- 1. Contract Documents
- 2. Definitions, Intent, Correlation and Streamlining
- 3. Additional Detail Drawings and Instructions
- 4. Copies Furnished Contractor
- 5. Shop Drawings
- 6. Project and Record Documents
- 7. Ownership of Drawings
- 8. Samples
- 9. Progress Schedule and Charts
- 10. Materials, Equipment and Employees
- 11. Equipment and Material Deviation
- 12. Royalties, Patents and Copyrights
- 13. Surveys, Permits, Laws and Regulations
- 14. Protection of Work and Property
- 15. Climatic Conditions
- 16. Temporary Utilities
- 17. Inspection of the Work
- 18. Superintendence and Supervision
- 19. Changes in the Work
- 20. Claims for Extra Cost of Extra Work
- 21. Deductions for Uncorrected Work
- 22. Delays, Extension of Time
- 23. Correction of Work Before Final Payment
- 24. Correction of Work After Final Payment
- 25. Owner's Right to Correct Deficiencies
- 26. Owner's Right to Terminate Contract
- 27. Contractor's Right to Stop Work or Terminate the Contract
- 28. Applications for Partial and Final Payments
- 29. Verification, Certification and Approvals for Payment
- 30. Payments Withheld
- 31. Contractor and Subcontractors Insurance
- 32. Owner's Fire Insurance
- 33. Fire Insurance, Extended Coverage, Vandalism and Malicious Mischief
- 34. Contract Bonds
- 35. Damages
- 36. Liens
- 37. Assignment
- 38. Mutual Responsibility of Contractors
- 39. Separate Contracts
- 40. Subcontracts
- 41. Relations of Contractor and Subcontractors
- 42. Architect's Status
- 43. Architect's Decisions
- 44. Contracting Officer's Decisions
- 45. Cash Allowances
- 46. Use of Premises, Sanitary Provisions
- 47. Cutting and Patching
- 48. Periodic and Final Cleanup
- 49. Guarantee of the Work
- 50. Possession Prior to Completion
- 51. Liquidated Damages
- 52. Use of Foreign Materials
- 53. Withholding of Funds
- 54. Disputes Concerning Labor Standards
- 55. Disputes

- 56. Equal Opportunity
- 57. Certification of Non-Segregated Facilities
- 58. Exemptions to Equal Opportunity Clauses
- 59. Clean Air and Water
- 60. Clean Air and Water Certification
- 61. Exemptions to Environmental Protection Clause
- 62. Affirmative Action for Handicapped Workers
- 63. Covenant Against Contingent Fees
- 64. Officials Not to Benefit
- 65. Convict Labor
- Nondiscrimination in Employment
- 67. Gratuities
- 68. Copeland (Anti-Kickback) Act Nonrebate of Wages
- 69. Subcontracts -Termination
- 70. Audit by Department of Defense
- 71. Subcontractor Cost or Pricing Data Price Adjustments
- 72. Buy American Act
- 73. Approval
- 74. Subject to Federal-State Agreement
- 75. Relationship of the Federal Government
- 76. Suspension of Work
- 77. Termination for Convenience of the Owner
- 78. Use of United States Flag Vessels
- 79. Debarment and Suspension
- 80. Nondiscrimination
- 81. Lobbying
- 82. Drug-Free Work Place
- 83. Environmental Standards
- 84. National Historic Preservation
- 85. Hatch Act
- 86. Cargo Preference
- 87. Relocation and Real Property Acquisition
- 88. Contract Work Hours and Safety Standards Act
- 89. Davis-Bacon Act
- 90. State Addendum

#### CONTRACT DOCUMENTS:

The Contract consists of the following CONTRACT DOCUMENTS, including all additions, deletions, and modifications incorporated therein before the execution of the Contract Agreement:

## A. STATUTORY AND PROCEDURAL DOCUMENTS:

- (1) Advertisement for Bids (Invitation for Bids)
- (2) Instructions to Bidders (Information for Bidders)
- (3) Proposal (Bid)
- (4) Proposal Guaranty (Bidder's Bond)
- (5) Contract Agreement
- (6) Contract Bonds (Performance and Payment Bonds)
- B. GENERAL CONDITIONS OF THE CONTRACT
- C. DETAILED SPECIFICATION REQUIREMENTS
- D. DRAWINGS
- 2. DEFINITIONS, INTENT, CORRELATION, AND STREAMLINING:

#### A. DEFINITIONS:

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

- (1) ARCHITECT: The architect, architectural firm, association, or corporation employed by the Owner, or, in case of the termination of his employment, his successor designated by the Owner, to furnish the working drawings and specifications in the Contract Documents, to prepare the Contract Documents, prepare details and explanatory drawings, and provide architectural instructions necessary for the execution of the Work, and to check and approve manufacturers' data and shop drawings and when so provided in his contract, to exercise general administration of the Contract under the direction of the Contracting Officer.
- (2) BIDDER: The person, or persons, firm, partnership, association, corporation, or combination thereof, submitting a Bid for the Work, or any portion thereof, acting directly or through a duly authorized representative.
- (3) COMMISSION: The Armory Commission of Alabama or any agency that may be designated by the Legislature as its successor.
- (4) CONTRACT AGREEMENT: The written Contract Agreement executed between the Owner and the successful Bidder, covering the performance of the Work, by which the Contractor is bound to perform the Work and furnish the labor, materials and equipment under the terms of the Contract Documents, and by which the Owner is obligated to compensate him therefor at the mutually established and accepted rate or price, or as hereinafter provided.
- (5) CONTRACT BONDS: The approved bonds furnished by the Contractor and his Surety to guarantee both completion of the Contract in accordance with the Contract Documents and prompt payment to all persons supplying him or them with labor, materials, supplies, etc.
- (6) CONTRACTOR: The person or persons, firm, partnership, association or corporation, or combination thereof, that has entered into a Contract with the Owner for any work covered by the Contract Documents, acting directly or through his agents or employees.
- (7) CONTRACTING OFFICER: The Contracting Officer of the Armory Commission, acting either upon his own initiative or through duly authorized representatives and inspectors, acting severally within the scope of the particular duties entrusted to them or the authority given them.
- (8) MODIFICATIONS OF THE GENERAL CONDITIONS: Changes or modifications of the parts of the Armory Commission's Contract General Conditions.

- (9) NOTICE TO PROCEED: A proceed order issued by the Contracting Officer after final execution of the Contract fixing the time within which the Contractor shall begin the prosecution of the Work.
  - (10) OWNER: The State of Alabama acting by and through the Armory Commission.
- (11) BID: The written offer for the Work contemplated, when prepared and submitted by the Bidder in the required manner on the prescribed Bid Form, properly signed and guaranteed.
- (12) SPECIAL CONDITIONS: Additional special or general requirements that are necessary and peculiar to the particular project and which are not included in the parts of the Armory Commission's standard General Conditions.
- (13) SPECIFICATIONS: The general term comprising the Statutory and Procedural Documents, General Conditions of the Contract, the Detailed Standard and Project Specification requirements, together with all modifications thereof and all Addenda thereto.
- (14) SUBCONTRACTOR: Any properly qualified individual, firm, association, or corporation undertaking the performance of any part of the Work under the terms of the Contract Documents by virtue of an agreement between himself and the Contractor with the written approval of the Contracting Officer.
- (15) SURETY: The corporate body, licensed under the laws of Alabama, bound with and for the Contractor for the full and complete performance of the Contract and also for the payment of all claims recoverable under the Contract Bonds.
- (16) THE PROJECT: The total construction designed by the Architect of which the Work performed under the Contract Documents may be the whole or a part.
- (17) THE WORK: The Work includes all labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in such construction.
- (18) USPFO: The United States Property & Fiscal Officer. The USPFO is the State of Alabama representative for the National Guard Bureau, Washington, D.C., an agency of the United States Department of Defense.

#### B. INTENT:

The intent of the Contract Documents is to include all labor, materials, water, fuel, tools, plants, utility, and transportation services, and all other incidental services and expenses necessary or required for proper execution and completion of the work.

#### C. CORRELATION:

- (1) ORDER OF PRECEDENCE: Should any discrepancy arise between the various elements of the Contract Documents, precedence shall be given the same in the following order:
  - (a) The Contract Agreement
  - (b) The Detailed Specification Requirements
  - (c) Details appearing on the Drawings
  - (d) The Working Drawings
- (2) WORDS AND TERMS: Words used in the documents will be given their usual and common meaning unless from the entire Contract it is clear that some other meaning was intended. Words describing material or work which have a well known technical meaning or trade meaning unless specifically defined in the Contract Documents, will be construed in accordance with such well known meaning recognized by architects, engineers, and the trades. Technical terms will be construed in a technical sense, and a specially widely adopted trade meaning afforded certain terminology will be taken into account in any interpretation containing such terminology.

- (3) GENERAL AND SPECIAL CONDITIONS: Where both General and Special Conditions relate to the same thing, the Special will prevail; that is, the specific language will take precedence over the more general wording. However, where both the General and Special Conditions may be given reasonable effect, both are to be retained.
- (4) PRINTING, TYPING, AND WRITING: When a printed portion of the Contract Documents cannot be reconciled with a typewritten portion, the latter will prevail. Various types of duplicating processes will be considered typewriting instead of printing. Also, if one is typewritten and the other written in longhand, the one written in longhand will govern. Likewise, written numbers will govern.

Written specifications will take precedence over drawings. If a correction is made in specifications or on a drawing and the original conflicting statement is not crossed out, then the revision, written in or drawn in, will be considered what was meant.

Obvious clerical or drafting errors or omissions revealed by perusal of the Contract Documents as a whole will be discounted in determining the intent of the parties, insofar as this may be accomplished without contravention of legal principles or public policy.

- (5) DRAWINGS AND SPECIFICATIONS: The intent of the Specifications is to outline or indicate items of work on both, that cannot readily be shown on the Drawings and, further, to indicate types and qualities of materials and workmanship. Drawings and Specifications will be considered complimentary, and items of work mentioned or indicated on one and not on the other shall be included as if mentioned in both, except items definitely noted "Not in Contract" or marked "N.I.C."
- (6) CONTRACTOR'S CHECK: Prior to the execution of the Work, the Contractor shall check the Drawings and Specifications and shall immediately report all errors, discrepancies, and/or omissions discovered therein by letter to the Architect with a copy to the Contracting Officer. All such errors, discrepancies, and/or omissions will be adjusted by the Architect and/or the Contracting Officer, who will notify the Contractor. Any adjustments made by the Contractor without prior approval will be at his own risk and the settlement of any complications arising from such adjustment will be at his own expense.
- (7) EXPLANATIONS: Any doubt as to the meaning of the Specifications, or any obscurity as to the wording of them, will be explained by the Architect and all directions and explanations requisite or necessary to complete, explain or make definite any of the provisions of the Specifications and Drawings and given them due effect, will be given by the Architect in writing.

#### D. STREAMLINING:

(1) OMISSION OF WORDS AND PHRASES: The detailed Standard and Project Specifications are of abbreviated or "streamlined" type and include incomplete sentences in order to avoid cumbersome and confusing repetition of expression. Omissions of words or phrases such as "the Contractor shall," "in conformity therewith," "as noted," or "as indicated on the Drawings," "according to the Drawings," are intentional. Omitted words or phrases will be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.

Wherever in the Specifications or upon the Drawings, APPROVED, AUTHORIZED, CONTEMPLATED, CONSIDERED NECESSARY, DEEMED NECESSARY, DESIGNATED, DIRECTED, GIVEN, ORDERED, PERMITTED, PRESCRIBED, REQUIRED, or words of like import are used, they shall be construed to mean and intend "by the Contracting Officer;" and, similarly, the words ACCEPTABLE, SATISFACTORY, or words of like import shall be construed to mean acceptable to or satisfactory "to the Contracting Officer," unless otherwise expressly stated or the Contract clearly indicates another meaning.

Words "furnish," "install," "perform," "provide," and "work" shall mean that the Contractor shall furnish, install, perform, provide and connect up complete in operative condition and use all materials, equipment, apparatus, and required appurtenances of the particular item to which it has reference.

(2) APPLICABLE PUBLICATIONS: Reference to standard specifications, associations, bureaus, organizations, or industries, and the like, shall mean the latest edition of such references adopted and published at date of Advertisement for Bids.

#### 3. ADDITIONAL DETAIL DRAWINGS AND INSTRUCTIONS:

Further information and instructions may be issued by the Contracting Officer or prepared by the Architect and transmitted to the Contractor by the Contracting Officer or the Architect, during the progress of the Work by means of additional detail drawings or otherwise as deemed necessary to make more clear or specific the Drawings and Specifications in the Contract Documents, when and as required by the Work. All such drawings and instructions shall be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefrom.

Any discrepancies found between the Drawings and Specifications and site conditions shall be immediately reported in writing to the Architect who will promptly correct such error or omission in writing. Any work done by the Contractor after his discovery of such discrepancies, errors, or omissions shall be done at his own risk.

In case of differences between small and large scale drawings, the large scale drawings shall govern.

Where on any of the drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other portions of the Work.

Where the word "similar" occurs on the Drawings, it shall be interpreted in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection with other parts of the Work.

If the Contractor considers that any work is required in a manner to make it impossible to produce firstclass work, or should discrepancies appear among the Contract Documents, the Contractor shall request interpretation before proceeding with such work. If he fails to make such request, no excuse will thereafter be entertained for failure to carry out the work in a satisfactory manner.

#### COPIES FURNISHED CONTRACTOR:

Except as otherwise provided, all required copies of Drawings and Specifications reasonably necessary for the execution of the Work will be furnished to the Contractor by the Architect or Contracting Officer without charge. Other copies requested will be furnished at reproduction cost.

#### 5. SHOP DRAWINGS:

The Contractor shall check the Contract Drawings for accuracy and verify with field measurements as necessary. He shall submit to the Architect, with his criticism and/or approval, all layouts, detail schedules, shop drawings, and setting or erection drawings as required by the Specifications or requested by the Contracting Officer for proper installation of materials, without causing delay in the Work. The Contractor shall check Subcontractors' shop drawings for accuracy and see that work contiguous with and having bearing on work indicated on shop drawings is accurately and distinctly illustrated. Shop drawings shall be dated, numbered consecutively, show working and erection dimensions and necessary details, including complete information for connecting to other work. Any work required by shop drawings that is fabricated by the Contractor prior to approval shall be at his own risk.

All drawings and schedules, accompanied by a letter of transmittal containing project number, number of drawings, titles, or other pertinent data, shall be submitted to the Architect in quintuplicate by the Contractor (with his stamp of approval thereon) sufficiently in advance of construction requirements to allow checking, correcting, resubmitting, and rechecking. A duplicate of said letter, only, shall be mailed simultaneously to the Contracting Officer. If shop drawings show variations from the requirements of the Contract Documents because of standard shop practice or other reasons, specific mention of such variations shall be made in the letter of submittal.

Satisfactory drawings will be so identified, dated, approved, and three copies or sets returned to the Contractor by the Architect. Should shop drawings be disapproved, three sets will be returned to the Contractor by the Architect indicating corrections and changes to be made.

Such corrections, changes, including design and artistic effect, shall be made by the Contractor and bound sets of shop drawing prints shall be submitted in quintuplicate to the Architect until final approval is obtained. No corrections or changes indicated on shop drawings will be considered as Extra Work.

The approval of shop drawings, schedules, and setting drawings will be general and, except in departures found to be in the interest of the Owner and so minor as not to involve a change in the Contract Price or performance time, shall not be construed (1) as permitting any departure from contract requirements; (2) as relieving the Contractor of the responsibility for any error in details, dimensions, or otherwise that may exist in shop drawings or schedules; (3) as approving departures from Drawings and Specifications or from additional details or instructions previously furnished by the Architect, unless he has in writing called attention to such deviations at the time of submission, and secured written approval.

#### 6. PROJECT AND RECORD DOCUMENTS:

The Contractor shall keep on the site of the work in good order, at least one set of his Contract Drawings including shop drawings, Specifications, and all authorized Change Orders, and shall at all times give the Owner, Architect, and their authorized representatives access thereto.

The Contractor shall also keep in his office on the site of the work the two sets of Contract Drawings and Specifications furnished by the Owner, herein referred to as RECORD DRAWINGS, on which shall be recorded all work as built or installed, and such other information as is specified or required. He shall carefully draw and letter notes of explanation, in ink, on both sets of Record Drawings, or furnish two copies of detailed sketches as the Contracting Officer may require, as a fully dimensioned record of all work. The Record Drawings, supplemented by any detailed sketches deemed necessary, shall indicate the Work "AS BUILT". The Contractor will be required to prepare new drawings if the indications on the Record Drawings or the detailed sketches are illegible or otherwise unsatisfactory for future reference. Each record or correction made on such drawings will be initialed and dated by the Supervisor or Inspector.

#### 7. OWNERSHIP OF DRAWINGS:

All original or duplicated Drawings and Specifications, and other data prepared by the Architect, and copies thereof prepared and furnished to the Contractor by the Architect are the property of the Armory Commission.

Upon completion of the Work all copies of Drawings and Specifications, with the exception of two sets retained by the Contractor, and two sets of RECORD DRAWINGS, shall be returned by the Contractor to the Architect. The Record Drawings will be delivered by the Architect to the Owner on Completion of the Work.

#### 8. SAMPLES:

The Contractor shall, without undue delay, furnish and submit to the Architect any samples that require the Architect's approval, and also any samples that may be requested by the Contracting Officer, of any and all materials or equipment he proposes to use, and shall prepay all shipping charges on the samples. Samples shall be furnished sufficiently in advance to allow the Architect and/or Contracting Officer reasonable time for examination, investigation, or consideration, without delay to the Work.

The Contractor shall provide Subcontractors and his prospective manufacturers, material dealers or suppliers with complete information of pertinent contract requirements and all transactions therewith shall be through the Contractor.

No materials or equipment of which samples are required to be submitted for approval shall be used on the Work until such approval has been received, save only at the Contractor's risk and expense.

Each sample shall have a label indicating the material represented, its place of origin and the name of the producers, the Contractor, and the building or Work for which the material is intended. Where manufacturer's printed instructions for installations are required, duplicate copies of such directions shall be submitted with samples.

Samples of finished material shall be marked to indicate where the materials represented are required by the Drawings or Specifications.

A letter, submitting each shipment of samples shall be mailed by the Contractor to the Architect containing a list of the samples, the name of the building or Work for which the materials are intended, and the brands of materials and names of the manufacturers.

After a material has been approved by the Architect with the approval of the Contracting Officer, if required, no additional samples of that material will be considered and no change in brand or make will be permitted.

Approved samples of hardware, in good condition, may be suitably marked for identification and used in the Work.

The approval of any sample by the Architect or Contracting Officer will be only for the characteristics or for the uses named in such approval and shall not be construed in itself to change or modify any Contract requirements.

Failure of any materials to pass the specified 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.

Test samples as the Architect or Contracting Officer may deem necessary, will be produced from the various materials delivered to the Contractor for use in the Work. If any of these test samples fail to meet the specification requirements, any previous approval will be withdrawn and such materials shall be subject to removal and replacement by the Contractor with materials or equipment meeting the specification requirements, the defective materials may be permitted to remain in place subject to proper credit or adjustment of the Contract Price as hereinafter set forth under DEDUCTIONS FOR UNCORRECTED WORK.

The costs of tests will be borne by the Owner except where laboratory tests as hereinafter specified are required by the specifications.

#### 9. PROGRESS SCHEDULE AND CHARTS:

The Contractor shall within five days after date of commencement of work, prepare and submit to the Architect for approval, a practicable schedule showing the order in which the Contractor proposes to carry on the Work, the date he will start the several salient features, including procurement of material, plant, and equipment and the contemplated date of completion of same.

The schedule shall be in the form of a conventional Progress Chart of suitable scale to indicate appropriately the percentage of work scheduled for completion at any time. The Contractor shall enter on the chart his actual progress, preferably at the end of each week, but in any event at the end of each month, and deliver to the Architect two copies thereof and attach one to his monthly Application for Partial Payment.

If, in the opinion of the Architect or the Contracting Officer, the Contractor falls materially behind his progress schedule, the Contractor shall take such steps as may be necessary to improve his progress and the Architect or the Contracting Officer may require him to increase the number of shifts, and/or overtime operations, and/or the amount of construction plant, and to submit for approval such supplementary schedules in chart form as may be deemed necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the Owner.

Failure of the Contractor to comply with the requirements of the Architect or the Contracting Officer as above set forth will be grounds for determination by the Architect or the Contracting Officer that the Contractor is not prosecuting the Work with such diligence as will insure completion within the Contract Time. Upon determination of unreasonable delay, the Owner may terminate the Contractor's right to proceed with the Work, or any separable part thereof.

#### 10. MATERIALS, EQUIPMENT, AND EMPLOYEES:

Unless otherwise stipulated, the Contractor shall furnish all material, equipment, tools, labor, water, light, power, transportation, other services or facilities and incidentals for the proper execution and completion of the Work. Unless otherwise stipulated, all materials and equipment incorporated in the Work shall be new.

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 Contracting Officer, or who are considered unfit or unskilled, or otherwise objectionable, shall be dismissed upon notice from the Architect or Contracting Officer.

#### 11. EQUIPMENT AND MATERIAL DEVIATIONS:

Whenever any material or piece of equipment is identified on the plans or in the specifications by reference to manufacturer's names, model numbers, etc., it is intended to establish a required standard of design and quality, and is not intended to limit competition. It shall be expressly understood that the phrase "or approved equal" is hereby inserted following the naming of manufacturers for any material or equipment, whether such phrase occurs in the specifications, or not.

When the specifications and/or drawings indicate only one or two manufacturers' names for material or equipment to be used, the bidder may submit his bid based on material or equipment of manufacturers not named but considered by the bidder to be equal to the standard of design and quality as specified; however, such substitutions must be approved by the Architect. If the bidder elects to bid on a substitution without securing written approval of the Architect prior to receipt of bids, then it will be understood that proof of compliance with specified requirements is the direct responsibility of the bidder and no such material or equipment may be purchased or installed without written approval by the Architect.

When the specifications and/or drawings indicate three or more manufacturers' names for material or equipment to be used, the bids shall be based upon the equipment and material so named, unless the bidder desires to bid on an "approved equal". In case the bidder desires to substitute an "equal" he must secure written approval by the Architect of qualification to bid prior to date for receiving bids. If no request to substitute an "approved equal" is made by the bidder, and approved by the Architect, then it will be expressly understood that all such material and equipment so named or described in the specifications and on the drawings will be furnished in full accordance with the Contract Documents.

#### 12. ROYALTIES; PATENTS; AND COPYRIGHTS:

The Contractor shall pay all royalties and license fees. The Contractor shall hold and save the Owner and his agents and employees harmless from liability of any nature or kind, including cost and expenses, for or on account of any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the Owner.

If the Contractor has information that any process, article or item specified or delineated by the Architect is an infringement of a patent, or a copyright, he shall promptly give such information to the Architect.

#### 13. SURVEYS, PERMITS, LAWS, AND REGULATIONS:

The Contractor shall provide competent engineering services to execute the Work in accordance with contract requirements. He shall verify the figures given for the contours, approaches and locations shown on the Drawings before undertaking any construction work and be responsible for the accuracy of the finished work. Without extra cost to Owner, he 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.

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 slope stakes, batter boards and other working points, lines and elevations.

If the Contractor finds any errors or discrepancies, or that any previously established references have been destroyed or misplaced, he shall promptly notify the Architect.

The Contractor shall obtain and pay for all licenses and permits and shall pay all fees and charges for connection to outside service and the use of property, other than the site of the Work, required for the execution and completion of the Work.

The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations, and building code requirements applicable to or bearing on the conduct of the Work unless in conflict with Contract requirements. If the Contractor ascertains at any time that any requirement of the Contract is at variance with applicable laws, ordinances, regulations, or building code requirements, he shall promptly notify the Architect, and any necessary adjustment of the Contract will be made as hereinafter specified under CHANGES IN THE WORK.

The Contractor shall pay all applicable Federal, State and local taxes and assessments on the real property of the site of the Work.

Wherever the law of the place of building requires a special sales tax, consumer, use, occupation, or other tax, the Contractor shall pay such tax.

#### 14. PROTECTION OF WORK AND PROPERTY:

The Contractor shall at all times adequately maintain, guard and protect his own work from damage, and safely guard and protect the Owner's property from injury or loss arising in connection with this Contract. He shall make good any such damage, injury or loss, except such as may be directly due to errors in the Contract Documents or caused by agents or employees of the Owner.

He shall adequately protect adjacent property as provided by law and Contract Documents.

Any damage to existing structures, or the interruption of a utility service shall be repaired or restored promptly by and at the expense of the Contractor.

The Contractor shall protect all existing vegetation such as trees, shrubs, and grass on or adjacent to the site which are not required to be removed or do not unreasonable interfere with construction, as may be determined by the Architect or Contracting Officer, and be responsible for all unauthorized cutting or damaging of trees and shrubs, including damage due to careless operation of equipment, stockpiling of materials, on grass areas by equipment.

Care shall be taken by the Contractor in felling trees that are to be removed to avoid any unnecessary damage to vegetation or other trees that are to remain in place. Any limbs or branches unavoidably broken during such operations shall be trimmed with a clean cut and painted with an approved tree priming compound. The Contractor may be required to replace or restore at his own expense all vegetation not protected and preserved, as above required, that may be destroyed or damaged.

The Contractor shall provide and maintain all passageways, guard fences, lights, and other facilities required for protection by state or municipal laws and regulations or local conditions.

The Contractor shall take all necessary precautions for the safety of employees on the Work and shall comply with all applicable provisions of federal, state, and municipal safety laws and building codes to prevent accidents or injury to persons on or about or adjacent to the premises where the Work is being performed. He shall erect and properly maintain at all times, as required by conditions and progress of the Work, all necessary safeguards for the protection of workmen and the public, and shall post danger signs warning against the hazards created by such features of construction as protruding nails, hoists, well holes, elevator hatchways, scaffolding, window openings, stairways, and falling materials.

Machinery, equipment and all hazards shall be guarded or eliminated in accordance with the latest edition of the Manual of Accident Prevention in Construction of the AGC to the extent that such provisions are not in contravention of applicable laws.

In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor may act, without previous or special instructions from the Architect, or the Contracting Officer, at his discretion; and shall so act, without appeal, if so instructed or authorized by the Architect or the Contracting Officer.

Any compensation claimed by the Contractor as Extra Work on account of emergency work, together with substantiating documents in regard to expense, shall be submitted through the Architect to the Contracting Officer who will determine the amount of compensation.

#### 15. CLIMATIC CONDITIONS:

When so ordered by the Architect or Contracting Officer, the Contractor shall suspend any work that may be subject to damage by climatic conditions.

#### 16. TEMPORARY UTILITIES:

Unless otherwise agreed to by the Owner in writing, the Contractor shall provide all necessary utility services, at his expense, until the job is complete and accepted by the Owner. All utilities services shall include, but not be limited to, the following: electricity; gas; water; sewer; telecommunications; waste (dumpster) disposal, etc.

The Contractor shall provide all utility services as necessary to install and/or test all work and materials, and further to protect and maintain all work and materials against injury or damage from heat or cold and from humidity/dampness. The Contractor shall continue to provide these services, at his expense, until completion and final acceptance by the Owner of all work in the Contract. The Contractor may be relieved of utilities expenses, in whole or part, should the building(s) be fully occupied by the Owner prior to such final acceptance of the work. The Contractor may petition in writing for the Owner to consider this relief of utilities expenses (either partially or wholly) due to this full occupation of the building(s) by the Owner. The Owner must provide a written and signed agreement in order to relieve Contractor of the utilities expenses. Any such date of relief shall be as established in this written agreement.

In the absence of any such written agreement by the Owner, the Contractor shall continue to provide heat and conditioned air as necessary to protect all work and materials against injury from dampness and heat/cold until final acceptance of all work in the Contract as indicated herein.

- A. HEATING: During cold weather or the winter months, the Contractor shall provide heat and weather protection as follows:
- (1) At all times during the placing, setting, and curing period of concrete, sufficient heat to insure the heating of spaces to not less than 50° F. or in accordance with the manufacturer's recommendations.
- (2) From the beginning of the application of plaster and during the setting and curing period, sufficient heat to produce a temperature of not less than 50° F. or in accordance with the manufacturer's recommendations.
- (3) For a period of ten days previous to the placing of interior wood finish work and throughout the placing of wood finish and other interior finishing, varnishing, painting, etc., and until final acceptance of the Work, sufficient heat to produce a temperature of not less than 70° F. or in accordance with the manufacturer's recommendations.
- (4) Provide temporary closures for windows, doors, and all temporary openings and take every reasonable precaution to prevent the escape of warm air from or entrance of cold air into the building. Except as elsewhere called for, the temperature required in the unoccupied spaces will be from 45° F. to 65° F.
- B. VENTILATION and AIR CONDITIONING: During hot weather or the summer months, the Contractor shall provide ventilation and/or air conditioning as required in order to maintain the temperature of the interior of the building(s) between 70° F. and 80° F. The Contractor shall also maintain the humidity level of the interior of the building(s) within the ranges specified in the Contract Documents.
- C. In all cases, Contractor shall be responsible to maintain the appropriate temperature range and humidity levels as is recommended by the manufacturer of all the various building materials, furnishings, equipment, components, systems, etc. to prevent any damage due to heat or cold or humidity.
- D. Unless otherwise agreed to by the Owner in writing, the Contractor shall continue to provide these utility services, at his expense, until the job is complete and accepted by the Owner.

#### 17. INSPECTION OF THE WORK:

The Architect, the Contracting Officer, any Federal or State agency 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 Specifications, shall be subject to inspection, examination, and test by the Architect (or his

duly authorized representative) at any and all places where such manufacture and/or construction are being carried on. The Architect shall have the right to reject defective material and workmanship or require its correction. Rejected workmanship shall be satisfactorily corrected, and rejected material shall be satisfactorily replaced with proper material without charge therefor, and the Contractor shall promptly segregate and remove the rejected material from the premises.

The Contracting Officer will appoint or assign architectural and engineering Inspectors, with designated duties and restricted authority, to inspect the Work as he may direct, or to make special inspections requested in advance by the Contractor, and to report to him progress of the Work, and manner of procedure, quality of the material and workmanship, and compliance with the Contract Documents. Inspectors shall have the authority to give directions for the safety and convenience of the public, and concerning the conduct of the Work; to advise the Contractor to avoid his making errors and to expedite his correction of deviations in the Work, to reject materials, workmanship, or equipment clearly defective or otherwise not in accordance with the Drawings and Specifications; but neither the presence nor absence of such Inspectors shall relieve the Contractor from any contract requirement.

Neither the Inspectors, nor the Architect, will be 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 Drawings and Specifications; nor shall they supervise and direct work for the Contractor, nor unreasonably interfere with the Contractor's operations beyond the extent necessary to make certain that the Work is being carried out according to the contract requirements.

Any advice which they may give the Contractor shall not be construed as binding the Owner or the Contracting Officer in any way, nor as releasing the Contractor from any of the contract requirements.

If the Contractor considers any work demanded of him to be outside the contract requirements, or any record or ruling of the Architect or an Inspector to be unfair, he may immediately, upon such work being demanded or ruling made, request written instructions from the Architect, or Inspector, or within ten days file an appeal with the Contracting Officer, stating clearly and in detail the basis of his objections. However, pending the Contracting Officer's decision on such appeal, no work shall be done in disregard of the rulings of the Architect or Inspector or his instructions on items of work affected by such appeal.

The Contractor shall furnish promptly, without extra compensation, all reasonable facilities, labor, and material necessary for safe and convenient access, inspection, and tests that may be required by the Contracting Officer or the USPFO. All inspections and tests will be performed in such a manner as not to cause unnecessary delay of the work. Special, full size, and performance tests shall be as described in Sections of the Specifications. The Contractor shall be charged any extra cost of inspection incurred by the Owner on account of material and workmanship not being ready at time of inspection set by the Contractor.

Should it be considered necessary or advisable by the Owner, or by the representatives of the Chief, National Guard Bureau, at any time before final acceptance of the entire work to make an examination of work already completed by uncovering, or removing or tearing out same, the Contractor shall, on request, promptly furnish all necessary facilities, labor, and materials. If such work is found to be defective in any material respect, due to the fault of the Contractor or his subcontractors, he shall defray all expense of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract Documents, work of examination and replacement will be considered and compensated for as Extra Work ordered by the Architect or Contracting Officer and, in addition, if completion of the Work has been delayed thereby, an extension of time will be granted for such delay as estimated by the Architect or Contracting Officer. Federal funding support of the cost for examination and replacement of satisfactorily completed work that requires removal or that is damaged due to inspection requirements is subject to prior approval by the Chief, National Guard Bureau, or his duly authorized representative.

When the Architect considers the work as nearing completion, or substantially completed, after being notified by the Contractor that the Work is completed, the Architect and the Contracting Officer or his representatives, duly authorized in writing, will inspect all the work included in the Contract Documents. If it is found that the Work has not been satisfactorily completed, the Architect will notify the Contractor, in writing, as to the work to be done or the particular defects to be remedied to place the work in condition satisfactory for acceptance. After the work has been satisfactorily completed, the Architect and the Contracting Officer will make the final inspection or inspections and notify the Contractor in writing when the Work has been finally accepted.

#### 18. SUPERINTENDENCE AND SUPERVISION:

The Contractor shall give his personal superintendence of the Work, using his best skill and personal attention, or have a qualified superintendent, and any necessary assistants acceptable to the Contracting Officer, on the Work at all times during progress, and with full authority to act in his behalf. The Contractor shall not remove a superintendent from the Work who is satisfactory to both him and the Architect, except with the Architect's consent, unless he ceases to be in his employ.

All instructions given the superintendent in the Contractor's absence by the Architect or the Contracting Officer or his representative shall be considered as given the Contractor. In general, the more important verbal instructions will be confirmed in writing to the Contractor; and upon written request of the Contractor, any other instructions will be confirmed in writing.

The Contractor shall carefully study and compare all Drawings, Specifications, other instructions and related data, and at once report in writing to the Architect, with a copy to the Owner, any inconsistency, discrepancy, error, or omission he may discover, for adjustment by the Architect. However, he shall not be liable to the Owner for any damage resulting from any errors or deficiencies in the Contract Documents, except that adjustments made without prior approval will be at his own risk.

#### 19. CHANGES IN THE WORK:

The Owner may at any time make changes in the Work by changes in the Drawings and Specifications of the Contract and within the general scope thereof. Changes will be in the form of a Contract Change Order based upon a written request of the Owner and a written proposal of the Contractor. In making any change, the charge or credit for altering, adding to or deducting from the Work shall be determined by one of the following methods selected by the Owner:

- A. By mutually agreed price or prices which will be added to or deducted from the Contract Price. Additions to the contract price shall include the Contractor's overhead and profit but shall not exceed 15 percent. Where subcontract work is involved, the total mark-up for the Contractor and subcontractors shall not exceed 25%. This percentage allowance for overhead and profit shall include the cost of superintendent, timekeeper, clerks, watchmen, use of small tools, incidental job burdens, and general office expenses. There will be no additional or separate charges for these items. No allowance for overhead and profit shall be figured on any change which involves a net credit to the Owner.
- B. By estimating the number of unit quantities of each part of the Work which is changed and then multiplying the estimated number of such unit quantities by the applicable unit prices, if any, set forth in the Contract, or other mutually agreed unit prices. The percentage and criteria for overhead and profit shall be as detailed in paragraph A above. There will be no additional or separate charges allowed for superintendent, timekeeper, clerks, watchmen, use of small tools, incidental job burdens, and general office expenses.
- C. By ordering the Contractor to proceed with the Work on a cost-plus-percentage-of-the-cost basis and to keep and present in such form as the Contracting Officer will approve, duplicate itemized statements of the cost of the change together with all vouchers therefor, detailed as to the following items:
- (1) Name, classification, date, daily hours, total hours, rate, and extensions for such laborers and pro-rata charges for foreman.
- (2) Designation, dates, daily hours, total hours, rental rates, and extensions for each piece of equipment or power tool actually used.
  - (3) Quantity of each material item actually used and extension.
  - (4) Transportation on materials used.
- (5) Power and all items of cost such as cost of property damage, public liability and workmen's compensation insurance; also social security, old age and unemployment insurance.
- (6) The percentage allowance for the Contractor's overhead and profit shall not exceed a total of 15 percent of the net cost of above items (1), (2), (3), (4) and (5). The percentage allowance for overhead

shall include the cost of bonds, superintendent, timekeeper, clerks, watchmen, use of small tools, incidental job burdens, general office expenses, and insurance other than items listed above in paragraph C(5).

(7) The credits to the Owner for deductive changes shall be the net cost to the Contractor, excluding project overhead and profit.

The Contractor shall furnish to the Owner an itemized breakdown of the quantities and prices to be used in estimating the value of any change that might be ordered.

Federal funding support of any change or extra is subject to prior approval by the Chief, National Guard Bureau, or his/her duly authorized representative.

#### 20. CLAIMS FOR EXTRA COST OR EXTRA WORK:

If the Contractor claims that any instructions, by drawings or otherwise, are not in accordance with the Contract Documents, and involve extra cost under the Contract, he shall give the Architect and the Contracting Officer written notice there of within ten (10) days after receipt of such instructions, and in any event before proceeding to execute the work, and the procedure shall then be as above under 19, CHANGES IN THE WORK. Otherwise no such claim will be considered.

Federal funding support of any change or extra is subject to prior approval by the Chief, National Guard Bureau, or his/her duly authorized representative.

#### 21. DEDUCTIONS FOR UNCORRECTED WORK:

If the Owner deems it expedient to correct work injured or installed at variance with the Contract requirements, the Owner may, if he finds it to be in his interest, allow part or all of such work to remain in place, provided an equitable deduction from the Contract Price is offered by the Contractor and approved by the Contracting Officer.

### 22. DELAYS; EXTENSION OF TIME:

Delays: A delay beyond the Contractor's control at any time in the progress of Work by an act or omission of the Owner or the Architect, or the Contracting Officer or by any other Contractor employed by the Owner, or by strikes, fires, abnormal floods, tornadoes, or other cataclysmic phenomenon of nature, may entitle the Contractor to an extension of time in which to complete the Work as determined by the Contracting Officer provided, however, that the Contractor shall immediately give written notice to the Architect of the cause of such delay.

No such extension shall be made for delays due to rain, wind, flood, or other natural phenomenon of normal intensity for the locality, or for delay occurring more than seven (7) days before written claim therefor is submitted by the Contractor.

Extension of Time: In the event any material changes, alterations or additions are made as herein specified which in the opinion of the Contracting Officer, will require additional time for the execution of any work under the Contract, then, in that case, the time of completion of the Work will be extended by such a period of time as may be fixed by the Contracting Officer, and his decision shall be final and binding upon the Owner and the Contractor, provided that in such case the Contractor within seven (7) days after being notified in writing of such changes, alterations or additions shall request in writing an extension of time, but no extensions of time shall be given for any minor changes, alterations or additions. The Contractor shall not be entitled to any reparation or compensation on account of such additional time or extensions of time required for the execution of the Work. Only claims for compensation that are approved in accordance with the procedures outlined as above in Paragraph 19, CHANGES IN THE WORK and in Paragraph 20, CLAIMS FOR EXTRA COST OR EXTRA WORK and are also approved in writing by the Owner shall be considered. Otherwise no such claims will be considered.

#### 23. CORRECTION OF WORK BEFORE FINAL PAYMENT:

Any defective work, whether the result of poor workmanship, the use of defective materials, damage through carelessness of the Contractor or his employees, or any other cause, shall be removed from the premises within ten (10) days after written notice is given by the Architect, and promptly replaced and re-

executed by the Contractor in accordance with the contract requirements and without expense to the Owner. The Contractor shall also bear the expense of making good all work of the Owner or his other contractors destroyed or damaged by such removal and replacement.

#### 24. CORRECTION OF WORK AFTER FINAL PAYMENT:

Verification and approval of the Final Application for Payment and the making of the Final Payment by the Owner shall not relieve the Contractor of responsibility for faulty materials or workmanship. The Owner or the User shall promptly give notice of observed defects due to faulty materials or workmanship, and any damage to other work resulting therefrom, and in accordance with the terms of any special guarantees provided by the Contract, and the Contractor shall promptly replace any such defects discovered within one year from the date of written acceptance of the Work or Final Payment therefor, whichever is prior. All questions arising hereunder, notwithstanding Final Payment, shall be decided by the Contracting Officer.

#### 25. OWNER'S RIGHT TO CORRECT DEFICIENCIES:

Upon failure or neglect by the Contractor to properly prosecute, or to perform the Work in accordance with the Contract Documents, including any requirements with respect to the Progress Schedule and/or Charts, and after ten (10) days' written notice to the Contractor by the Contracting Officer, the Owner may, without prejudice to any other remedy he may have, correct such deficiencies and may deduct the actual cost thereof to the Owner from payment then or thereafter due to the Contractor, provided, however, that the Contracting Officer shall approve both such action and the amount charged the Contractor.

#### 26. OWNER'S RIGHT TO TERMINATE CONTRACT:

If the contractor refuses or fails to prosecute the work, or any separate part thereof, with such diligence as will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within such time, or if the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to Subcontractors for material or labor, or disregard laws, ordinances, or the instructions of the Contracting Officer or the Architect, or otherwise be guilty of a substantial violation of any provision of the Contract, then the Owner, upon the certificate of the Contracting Officer that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor, and his Surety, ten (10) days' written notice, terminate the employment of the Contractor and take possession of the promises and of all materials, tools, equipment, and appliances thereon and finish the Work by whatever method he may deem expedient. In such cases, the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price shall exceed the expense of finishing the work, including compensation for additional architectural, engineering, managerial, and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner as herein provided, and the damage incurred though the Contractor's default, shall be certified by the Contracting Officer.

#### 27. CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT:

If the Work should be stopped under an order of any court, or other public authority, for a period of ninety (90) days, through no act or fault of the Contractor or of anyone employed by him, then the Contractor may, upon fourteen (14) days' written notice to the Owner and the Contracting Officer, stop work or terminate this Contract at the Owner(s) will reimburse the Contractor for all work properly executed and any proven loss sustained upon any plant or materials and any other proper item of damage certified by the Contracting Officer.

#### 28. APPLICATIONS FOR PARTIAL AND FINAL PAYMENTS:

The Contractor shall, within ten (10) days after the Notice to Proceed, submit to the Architect on the application for payment form approved or furnished by the Contracting Officer, a complete breakdown or schedule of values of the Contract price showing the value assigned to each of the various parts of the work, including an allowance for overhead and profit, aggregating the total contract price so divided as to facilitate payments to subcontractors. Upon approval, this breakdown of the contract price, unless later found to be in error, shall be used as a basis for all applications for payment.

Unless otherwise provided in the Special Conditions or the Contract Agreement, the Contractor may make application for partial payment once each calendar month based on an approved estimate of work completed. The application shall be submitted through and certified by the Architect. The Owner will make partial payments to the Contractor as soon as practicable after receipt of the certified application for payment.

An application for partial payment may include the Contractor's cost of materials not yet incorporated in the work but delivered and suitably stored on the site.

In making partial payments there shall be retained not more than five (5) percent of the estimated amount of work done and the value of materials stored on the site, and after 50 percent completion has been accomplished, no further retainage will be withheld. The retainage above set out shall be held until final completion and acceptance of all work covered by the contract.

If the Contractor's claim to amounts payable under the contract has been assigned under the Assignment of Claims Act of 1940, as amended (41 U.S.C. 15), a release may also be required of the assignee at the option of the Contracting Officer or USPFO of the State. The retainment on partial payments of Federal funds shall be determined by the USPFO of the State in conformance with the Defense Acquisition Regulations (DAR).

The Contractor, immediately after being notified by the Contracting Officer that all other requirements of the Contract have been completed, shall give notice of said completion by an advertisement for a period of four (4) successive weeks in some newspaper of general circulation published within the county where the work was performed. Proof of publication of said notice in duplicate shall be furnished by the Contractor to the Architect by affidavit of the publisher and a printed copy of the notice 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 (30) days and proof of same made by the Probate Judge or Sheriff and the Contractor. Final payment shall be due as noted by the Contracting Officer's verification of the Final Application for Payment.

#### 29. VERIFICATION, CERTIFICATION, AND APPROVALS FOR PAYMENT:

When the Contractor has made application for payment as above, the Contracting Officer shall, not later than the date when each payment falls due, verify the application for Payment to the Contractor for such amount as he decides to be properly due, or state in writing to the Contractor his reasons for withholding verification in whole or in part, and place the application in line for payment.

No such verification nor payment made to the Contractor, nor partial or entire use or occupancy of the work by the Owner, shall be an acceptance of any work or materials not in accordance with the Contract.

All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of material and work upon which payments have been made or the restoration of any damaged work or as a waiver of the right of the Owner to require the fulfillment of all the terms of the Contract.

#### 30. PAYMENTS WITHHELD:

The Owner may withhold payment of the whole or any part of a verified or approved Application for Payment to such an extent as may be necessary to protect himself from loss on account of any of the following causes discovered subsequent to its verification or approvals:

- A. Defective work.
- B. Evidence indicating probable filing of claims by other parties against the Contractor.
- C. Failure of the Contractor to promptly make payments to subcontractors, or for materials, labor, equipment and supplies.
  - D. Damage to another contractor under a separate Contract with the Owner.

When the above grounds are removed, applications for payments will then be verified and/or approved for amounts not previously verified and approved because of them.

Workmen's Compensation and

Injury or death to more than one

person in a single occurrence:

Α.

D.

Indemnity:

#### 31. CONTRACTOR AND SUBCONTRACTORS INSURANCE:

The Contractor shall not commence work under the Contract until he has obtained all insurance required thereunder from an insurance company authorized to do business in Alabama, and shall have filed the certificate of insurance showing type of coverage and correlation between the insurance furnished and that required or the certified copy of the insurance policy with the Contracting Officer through the Architect; nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance has been so obtained and filed. Each insurance policy shall contain a clause that it shall not be cancelled by the insurance company without thirty (30) days' written notice to the Owner of intention to cancel. The amounts of such insurance shall not be less than the following:

	Employer's Liability:	\$ Statutory
B.	Public Liability, BodilyInjury and Property Damage:	
	Injury or death of one person: Injury or death to more than one	\$ 50,000 \$200,000
	person in a single occurrence: Property Damage:	\$ 50,000
C.	Automobile and Truck Liability, Bodily Injury and Property Damage:	
	Injury or death to one person:	\$ 50,000

Property Damage: \$ 50,000 SEE BELOW

The Contractor shall assume all liability for and shall indemnify and save harmless, the State, Owners, Architect, and employees of the Armory Commission, from all damages and liability for injury to any person or persons, and injury to or destruction of property, including the loss of use thereof, by reason of an accident or occurrence arising from operations under the Contract, whether such operations be by himself or by a Subcontractor or by any one directly or indirectly employed by either of them, occurring on or about the premises, or the ways and means immediately adjacent, during the term of the contract, or any extension thereof, and shall also assume the liability for injury and/or damages to adjacent or neighboring property by reason of work done under the Contract.

\$200,000

The Contractor shall take out and maintain during the life of the Contract, insurance covering his liability under the above save harmless provision, and shall show evidence of coverage on the certificate of coverage previously noted.

The obligations of the Contractor under this paragraph 31-D shall not extend to the liability of the Architect, his agents or employees arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect, his agents or employees provided such giving or failure to give is the primary cause of the injury or damage.

#### 32. OWNER'S FIRE INSURANCE (NOT USED)

#### 33. FIRE INSURANCE, EXTENDED COVERAGE, VANDALISM AND MALICIOUS MISCHIEF:

Unless otherwise provided in the Modified General or Special Conditions, the Contractor shall, at his own expense, insure the Work included in the Contract against loss or damage by fire and against loss or damage covered by the standard extended coverage endorsement, with an insurance company or companies qualified to do business in Alabama and acceptable to the Owner, the amount of insurance at all times to be at least equal to the amount paid on account of work or materials incorporated in the Work and plus the value of work or materials furnished or delivered but not yet paid for by the Owner. The policies shall be in the names

of the Owners and the Contractor and "all Subcontractors" as their interests appear, and certificates of the insurance company as to the amount and type of coverage, terms of policies, etc., shall be delivered to the Contracting Officer through the Architect before partial payments are made.

When changes in scope of the work by written Change Order or Change Orders/Supplemental Agreements aggregate an amount equal to 15% of the total contract, including the Change Orders/Supplemental Agreements, the insurance coverage included under this heading shall be increased accordingly. Proof of coverage shall be established by endorsement to the original policy or by reissue of the original policy to include the added coverage, or in accordance with any other acceptable policy of the insuring company for increasing the coverage.

#### 34. CONTRACT BONDS:

In order to insure the faithful performance of each and every condition, stipulation, and requirement of the Contract, and to indemnify and save harmless the Owner 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, within ten (10) days from the date of the award, unless otherwise stipulated in the Modified General Conditions, furnish at his own expense and file with the Owner an acceptable Surety Bond in an amount equal to one hundred (100) percent of the contract bid price of the Contract as awarded. Said Bond shall be made on the approved bond form, shall be furnished by a reputable surety company authorized to do business 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, including architectural, engineering, administrative, and legal services, shall lie against the Contract Bond for Performance of the Work.

In addition thereto, the successful Bidder to whom the Contract is awarded shall, within ten (10) days, unless otherwise stipulated in the General Conditions, furnish at his expense and file with the Owner an acceptable surety bond for Payment of Labor, materials, equipment and supplies, payable to the Owner in an amount equal to fifty (50) percent of the Contract Price, with the obligation that the Contractor shall promptly make payment to all persons furnishing him or them with 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 suits on said bond. The date of neither bond shall be earlier than the date of the Contract Agreement.

If any surety upon any bond furnished in connection with this contract becomes unacceptable to the State, or if any such surety shall fail to furnish reports as to his financial condition from time to time as requested by the State, the Contractor shall promptly furnish such additional security as may be required from time to time to protect the interests of the State or of persons supplying labor or materials in the prosecution of the work contemplated by the contract.

Bonds shall remain in force during the entire guarantee period stipulated in the Contract.

#### 35. DAMAGES:

Should either party of the Contract suffer damages because of any wrongful act or neglect of the other party or of anyone employed by him, claim shall be made in writing to the other party within a reasonable time of the first observance of such damage, and not later than the date of the Application for Final Payment, except as expressly stipulated otherwise in the case of faulty work or materials.

#### 36. LIENS:

The Owner may request a complete release of all liens and if this is done, neither the Final Payment nor any part of the retained percentage shall become due until the Contractor shall deliver to the Owner a complete release of all liens arising out of the Contract, and, an affidavit that so far as he has knowledge or information the releases include all the labor and material for which a lien could be filed; but the Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify him against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

#### 37. ASSIGNMENT:

The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any moneys due or to become due to him hereunder without the previous written consent of the Owner.

#### 38. MUTUAL RESPONSIBILITY OF CONTRACTORS:

If the Contractor or any of his Subcontractors cause any loss or damage to any separate contractor with a prior, concurrent, or subsequent contract on the Work or on the site, or any undue delay to such separate contractor on the Work or on the site, and if such contractor makes claim against the Owner, on account of any loss so sustained, the Owner shall notify the Contractor who shall indemnify and save harmless the Owner against any expenses arising therefrom.

#### 39. SEPARATE CONTRACTS:

The Owner may award other contracts for additional new construction, buildings or equipment, or for reconstruction, alteration, equipment, and improvement of existing buildings on the site, and the Contractor shall fully cooperate in the storage of materials and the detailed execution of work, coordinate and integrate his operations with such other contractors, and carefully fit his own work to that provided under other contracts, as he may be directed by the Contracting Officer. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor.

The Contractor, including his Subcontractors, shall keep himself informed of the progress and the detailed work of other contractors and shall notify the Contracting Officer immediately of lack of progress or defective workmanship on the part of other contractors, where such delay or such defective workmanship will interfere with his own operations of the work.

#### 40. SUBCONTRACTS:

Concurrent with the execution of the Contract by the Contractor he shall submit in writing in five (5) counterparts to the Architect for approval by the Architect and the Contracting Officer the names of the Subcontractors proposed for the work. Subcontractors that have been so approved may not be changed thereafter except at the request of or with the approval of the Contracting Officer.

The Contractor shall not employ any subcontractor to whom the Owner or Contracting Officer may have any objection, but he will not be required to employ any subcontractor against whom he himself has a reasonable objection.

The Contractor shall be as fully responsible to the Owner for the acts and omissions of Subcontractors, and of persons employed by them, as he is for the acts and omissions of persons directly employed by him.

Nothing contained in the Contract Documents shall be construed as creating any contractual relationship between any Subcontractor and the Owner.

#### 41. RELATIONS OF CONTRACTOR AND SUBCONTRACTORS:

The Contractor shall cause appropriate provisions to be inserted in all Subcontracts relative to the Work, to bind Subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the work of Subcontractors, and to give the Contractor the same power as regards terminating any provisions of the Contract Documents.

The Articles, Divisions, Sections, or Paragraphs of the Specifications are not intended to control the Contractor in dividing the work among Subcontractors or to limit the work performed by any trade.

The Contractor shall be responsible for the coordination of Subcontractors, of the trades, and material men engaged upon his work.

The Contractor shall, without additional expense to the Owner, utilize the services of specialty subcontractors on those parts of the work which are specified to be performed by specialty subcontractors.

The Contracting Officer or the Architect will not undertake to settle any differences between the Contractor and his Subcontractors or between Subcontractors.

#### 42. ARCHITECT'S STATUS:

The Architect named in the Contract Documents, who prepared and furnished the Working Drawings and the Specifications contained therein, will prepare details and explanatory drawings, and provide instructions during the progress of the work for transmittal by the Contracting Officer or Architect as above set forth under paragraph 3, ADDITIONAL DETAIL DRAWINGS AND INSTRUCTIONS. He will make his check of manufacturers' data and shop drawings submitted by the Contractor for the Work as above set forth under 5, SHOP DRAWINGS.

The Architect will endeavor to require the Contractor to strictly adhere to the plans and specifications, to guard the Owner against defects and deficiencies in the work of Contractors, and shall promptly notify the Contracting Officer in writing of any significant departure in the quality of materials or workmanship from the requirements of the plans and specifications, but he does not guarantee the performance of the contracts.

The Architect shall not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, unless spelled out in the Contract Documents, and he shall not be liable for results of the Contractor's failure to carry out the work in accordance with the Contract Documents.

The Architect shall have authority to require the Contractor to stop the Work whenever in his opinion it may be necessary for the proper performance of the Contract. The Architect shall not be liable to the Owner for the consequences of any decision made by him in good faith either to exercise or not to exercise his authority to stop the Work.

The Architect shall not be responsible for the acts or omissions of the Contractor, or any Subcontractors, or any of the Contractor's or Subcontractor's agents or employees, or any other persons performing any of the Work.

#### 43. ARCHITECT'S DECISIONS:

The Architect's decisions in matters relating to the artistic effect of his work shall be final, if within the other terms of the Contract.

#### 44. CONTRACTING OFFICER'S DECISIONS:

Except as hereinafter provided, any claim or question concerning the interpretation or meaning of the Contract Documents, or concerning a breach of the Contract, shall be submitted to the Contracting Officer and his decision shall be final, binding, and conclusive on the parties to the Contract. He shall have executive authority to enforce and make effective such decisions and orders as the Contractor fails to carry out promptly.

#### 45. CASH ALLOWANCES:

No cash allowances shall be included in the Contract Price, unless specifically set forth under SPECIAL CONDITIONS or MODIFICATIONS of the GENERAL CONDITIONS. When so included, the Contractor shall include in the Contract Price all allowances named therein and shall cause the work so covered to be done by such subcontractors, material, and/or equipment men, and for such sums as the Contracting Officer approves, and the Contract Price shall be adjusted in conformance therewith. The Contract Price shall include all the Contractor's expense, overhead, and profit, and no allowance, other than that included in the Contract Price, will be paid by the Owner.

## 46. USE OF PREMISES; SANITARY PROVISIONS:

The Contractor shall take every precaution against injuries to persons or damages to property.

The Contractor shall comply with local and State regulations governing the operation of premises which are occupied and shall perform the Contract in such a manner as not to interrupt or interfere with the operation of any other facility.

The Contractor shall store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the Work as will not unduly interfere with the progress of his work or the work of any other contractors.

Unless otherwise provided, temporary storage sheds, shops, and office facilities may be erected on the premises with the approval of the Architect or the Contracting Officer. Such temporary buildings and/or utilities shall remain the property of the Contractor and be removed at his expense upon completion of the Work, unless the Owner authorized their abandonment without removal.

Necessary crossings of curbings, sidewalks, roadways, or parkways shall be protected against damage, and any damage shall be repaired by or at the expense of the Contractor.

The Contractor shall not place upon the Work or any part thereof loads inconsistent with the safety of that portion of the Work.

No Contractor shall perform any work necessary to be performed after regular working hours or on Sundays or legal holidays without extra compensation.

The Contractor shall provide and maintain such sanitary accommodations for the use of his employees and those of his subcontractors as may be necessary to comply with the requirements and regulations of the local and State Department of Health and as directed.

#### 47. CUTTING AND PATCHING:

The Contractor shall do all necessary cutting, fitting, and patching of the Work that maybe required to properly receive the Work to make its several parts join together properly, receive and provide for the work of various trades, and be received by the work of other contractors, or as required by Drawings and Specifications to complete the Work. After such cutting, he shall replace or restore or repair and make good all defective or patched work as required by the Architect. He shall not cut, excavate, or otherwise alter any work in a manner or by a method or methods that will endanger the Work, adjacent property, workmen, the public, or the work of any other contractor.

The Contractor shall have his Subcontractor check the location of all sleeves, openings, slots, etc., for the piping, ducts, breeching, conduits, louvers, grilles, fans, etc., as they are laid out on the job.

Provision for openings, holes, and clearances through walls, beams, floors, ceilings, and partitions shall be made and checked by the Contractor and/or his Subcontractor in advance of constructing such parts of the Work, and unnecessary, superfluous or dangerous cutting avoided.

Pipes passing through concrete or masonry walls shall be protected by pipe sleeves two sizes larger than the pipe, plus its insulation, to provide free movement.

Under no condition shall structural, framing, or other parts or members subjected to computed stress be cut or disturbed without the approval of the Architect. Any plates, studs, or joists, and/or rafters that are approved to be cut to execute necessary work shall be securely strapped and braced to restore their original strength by an approved method.

The Architect's approval shall be obtained before cutting or drilling holes in concrete or masonry that tend to damage or weaken the load capacity.

#### 48. PERIODIC AND FINAL CLEANUP:

The Contractor shall periodically, or as directed during the progress of the Work, clean up and remove from the premises all refuse, rubbish, scrap materials and debris caused by his employees, his Subcontractors, or resulting from his work, to the end that at all times the premises are sanitary, safe, reasonably clean, orderly, and workmanlike. 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.

Before final completion and final acceptance the Contractor shall remove from the Owner's property, and from all public and private property, all tools, scaffolding, false work, temporary structures, and/or utilities

including the foundations thereof (except such as the Owner permits in writing to remain); rubbish and waste materials resulting from his operations or caused by his employees; and shall remove 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.

In addition to the above, the Contractor shall be responsible for the following special cleaning for all trades as the work shall have been 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 and polishing of all hardware.
- D. Cleaning all tile, floor finish of all kinds: Removal of all splatter, 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 dust pockets, piping, tanks, pumps, fans, motors, devices, switches, panels, fixtures, boilers, similar features; and freeing identification plates on all equipment of excess paint and the polishing thereof.

In case of failure to comply with the above requirements for any part of the work within the time specified by the Architect, he may cause the Work to be done and deduct the cost thereof from the Contract Price on the next or succeeding Application for Payment.

#### 49. GUARANTEE OF THE WORK:

Except as otherwise specified in the General Conditions or the Special Conditions, all work shall be guaranteed by the Contractor against defects resulting from the use of inferior materials, equipment, or workmanship for one year from the date of final completion of the Contract, or from full occupancy of the building by the Owner, whichever is earlier.

If, within any guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the Contracting Officer or Architect are required as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract requirements, the Contractor, shall, promptly upon receipt of notice from the Owner, and without expense to the Owner:

- A. Place in satisfactory condition in every particular all of such guaranteed work, correct all defects therein; and
- B. Make good all damage to the building or site, or equipment or contents thereof, which, in the opinion of the Contracting Officer or Architect, is the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract; and
- C. Make good any work or material, or the equipment and contents of said building or site disturbed in fulfilling any such guarantee.

In any case where in fulfilling the requirements of the Contract or of any guarantee, embraced in or required thereby, the Contractor disturbs any work guaranteed under another contract, he shall restore such disturbed work to a condition satisfactory to the Contracting Officer and guarantee such restored work to the same extent as it was guaranteed under such other contract.

If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected and the Contractor and his Surety shall be liable for all expense incurred.

All special guarantees applicable to definite parts of the work that may be stipulated in the Contract Documents shall be subject to the terms of this paragraph during the first year of the life of such special guarantee.

#### 50. POSSESSION PRIOR TO COMPLETION:

The Owner shall have the right to use any completed or partially completed part of the Work. Such use shall not be deemed an acceptance of any work not completed in accordance with the contract requirements. If, however, such prior use by the Owner delays the progress of the Work or causes additional expenses to the Contractor, an equitable adjustment in the Contract Price and/or time of completion will be made and the Contract will be modified in writing accordingly.

#### 51. LIQUIDATED DAMAGES:

Time is the essence of the Contract. Any delay in the completion of the Work as provided for in the Contract Documents will cause inconvenience to the public and loss and damage to the Owner in interest, and in additional administrative, architectural, inspection and supervision charges.

Therefore, a time charge equal to six per cent interest per annum on the total Contract Price will be made against the Contractor for the entire period that any part of the Work remains uncompleted after the time specified for the completion of the Work as provided in the Contract Documents, the amount of which shall be deducted by the Contracting Officer from the Final Estimate, and shall be retained by the Contracting Officer out of moneys otherwise due the Contractor in the Final Payment, not as a penalty, but as liquidated damages sustained, it being mutually understood and agreed between the parties hereto that such amount is reasonable as liquidated damages.

#### 52. USE OF FOREIGN MATERIALS:

In accordance with ACT 876 of the 1961 Regular Session of the Alabama legislature the Contractor shall use only materials, supplies, and products manufactured, mined, processed or otherwise produced in the United States or its territories, if same are available at reasonable prices.

Breaching of this agreement shall render the Contractor liable for payment of liquidated damages in the amount of not less than \$500.00 nor more than 20% of the gross amount of the contract.

This requirement applies to all contracts for public works financed entirely with State of Alabama funds.

#### 53. WITHHOLDING OF FUNDS (1977 DEC)

- A. The Contracting Officer may withhold or cause to be withheld from the prime contractor so much of the accrued payments or advances as maybe considered necessary (1) to pay laborers and mechanics, including apprentices, trainees, watchmen and guards, employed by the Contractor or any subcontractor on the work the full amount of wages required by the contract, and (2) to satisfy any liability of the Contractor and any subcontractor for liquidated damages under paragraph (B) of the clause entitled "Contract Work Hours and Safety Standards Act Overtime Compensation."
- B. If the Contractor or any subcontractor fails to pay any laborer, mechanic, apprentice, trainee, watchman, or guard employed or working on the site of the work all or part of the wages required by the contract, the Contracting Officer may, after written notice to the prime contractor, take such action as may be necessary to cause suspension of any further payments or advances until such violations have ceased.

#### 54. DISPUTES CONCERNING LABOR STANDARDS (ASPR 7-602.23)(77 DEC)

Disputes arising out of the labor standards provisions of this contract shall be subject to the DISPUTES clause except to the extent such disputes involve the meaning of classifications or wage rates contained in the wage determination decision of the Secretary of Labor or the applicability of the labor provisions of this

contract which questions shall be referred to the Secretary of Labor in accordance with the procedures of the Department of Labor.

#### 55. DISPUTES

Except as otherwise specifically provided in this contract, and except as otherwise specifically provided by the State procedure for arbitration or other State procedure established by State law, any dispute concerning a question of fact arising under this contract which is not disposed of by mutual agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and send by registered mail, return receipt requested, a copy thereof to the Contractor at his address shown herein. Within thirty (30) days after the date of receipt of such copy, the Contractor may appeal in writing to the Governor of this State, whose written decision therein, or that of his designated representative or representatives, shall, unless determined by a court of competent jurisdiction to have been fraudulent or capricious or arbitrary or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence, be final and conclusive: Provided, that if no such appeal is taken, the decision of the Contracting Officer shall be final and conclusive. The Governor of this State may designate an individual or individuals other than the Contracting Officer, or a board, as his authorized representative to determine appeals under this Article. In connection with any appeal proceeding under this Clause, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of his appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the Contracting Officer's decision. Any sum or sums allowed to the Contractor under the provisions of this Article or under the State Arbitration proceedings or under other State procedure shall be paid subject to approval of the Chief, National Guard Bureau, for the Government's share of the cost of the Articles or work herein disputed as deemed to be within the contemplation of this contract.

#### 56. EQUAL OPPORTUNITY (FEDERALLY ASSISTED CONSTRUCTION) (ASPR 7-103.18)(1978 SEP)

If, during any twelve (12) month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded Federal contracts and/or subcontracts which have an aggregate value in excess of \$10,000, the Contractor shall comply with (A) through (G) below. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.)

The applicant hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the Regulations of the Secretary of Labor at 41 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the following Equal Opportunity clause:

During the performance of this contract, the Contractor agrees as follows:

- A. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include but not be limited to the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- B. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.
- C. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

- D. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and of the rules, regulations and relevant orders of the Secretary of Labor.
- E. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- F. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations or orders, this contract may be cancelled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or Federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.
- The Contractor will include the portion of the sentence immediately preceding paragraph (A) and the provisions of paragraphs (A) through (G) in every subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States. The applicant further agrees that it will be bound by the above Equal Opportunity Clause with respect to its own employment practices when it participates in Federally assisted construction work: Provided, that if the applicant so participating is a State or local government, the above Equal Opportunity Clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract. The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of Contractors and subcontractors with the Equal Opportunity Clause and the rules, regulations and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance. The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, with a Contractor debarred from, or who has not demonstrated eligibility for, Government contracts and Federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the Equal Opportunity Clause as may be imposed upon Contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: cancel, terminate or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refusal occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

#### 57. CERTIFICATION OF NONSEGREGATED FACILITIES (1970 AUG) (ASPR 7-2003.14)

(Applicable to contracts, subcontracts, and to agreements with applicants who are themselves performing Federally assisted construction contracts, exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause). By the submission of this bid, the bidder, offeror, applicant, or subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are

maintained. The bidder, offeror, applicant, or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion or national origin, because of habit, local custom or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of Equal Opportunity Clause; that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods).

# NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES:

A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

## 58. EXEMPTIONS TO EQUAL OPPORTUNITY CLAUSES (ASPR 12-805) (JUL 76)

- Α. Transactions of \$10,000 or Under. Contracts and subcontracts not exceeding \$10,000, other than Government bills of lading, are exempt from the requirements of the Equal Opportunity Clause. In determining the applicability of this exemption to any Federally assisted construction contract, or subcontract thereunder, the amount thereof rather than the amount of the Federal financial assistance shall govern. Indefinite delivery type contracts and subcontracts thereunder, basic agreements and basic ordering agreements shall include the Equal Opportunity Clause, except when the Contracting Officer (in the case of subcontractors, the prime contractor or subcontractors issuing the subcontract) determines that the amount to be ordered is not expected to extend \$10,000 in any single year. The applicability of the Equal Opportunity Clause shall be determined by the Contracting Officer at the time of award for the first year, and annually thereafter for succeeding years if any. Notwithstanding the above, the Equal Opportunity Clause shall be incorporated into such contract, subcontract, basic agreement or basic ordering agreement whenever the amount of a single order or procurement action exceeds \$10,000. Once the clause is incorporated, the contract, subcontract, basic agreement, or basic ordering agreement shall continue to be subject to such clause for its duration, regardless of the amounts ordered, or reasonably expected to be ordered, in any year. No Contracting Officer, Contractor, or Subcontractor, shall procure supplies or services in less than usual quantities to avoid applicability of the Equal Opportunity Clause.
- B. Work Outside the United States. Contracts and subcontracts are exempt from the requirement of the Equal Opportunity Clause with regard to work performed outside the United States by employees who were not recruited within the United States.
- C. Contracts with State or Local Governments. The requirements of the clause in any contract or subcontract with a State or local government (or any agency, instrumentality or subdivision thereof) shall not be applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract or subcontract. In addition, State and local governments are exempt from the requirements of filing the annual compliance report provided for by 12-812(a) and maintaining a written affirmative action program prescribed by 12-807.1.
  - D. Contracts Exempted by the Secretary of Defense in the Interest of National Security.
- (1) Any requirement set forth in this Part shall not apply to any contract or subcontract whenever the Secretary of Defense determines that such contract or subcontract is essential to the national security and that its award without complying with such requirement is necessary to the national security.
- (2) Requests for Exemption: The Contracting Officer shall prepare a detailed justification for such determination which shall be submitted to the ASD(M&RA) in accordance with Departmental procedures.

The ASD(M&RA) shall submit the request for exemption to the Secretary of Defense for approval, and shall notify the Director, OFCC, within 30 days of such a determination.

## E. Specific Contracts and Facilities Exempted by the Director, OFCC.

- (1) Specific Contracts. The Director, OFCC, may exempt an agency or person from requiring the inclusion of any or all of the Equal Opportunity Clause in any specific contract or subcontract when he deems that special circumstances in the national interest so require. He may also exempt groups or categories of contracts or subcontracts of the same type where he finds it impracticable to act upon each request individually or where group exemptions will contribute to convenience in the administration of the Order.
- (2) Facilities Not Connected with Contracts. The Director, OFCC, may exempt from the requirements of the clause any of a prime contractor's or a subcontractor's facilities which he finds to be in all respects separate and distinct from activities of the prime contractor or subcontractor related to the performance of the contract or subcontract, provided that he also finds that such an exemption will not interfere with or impede the effectuation of the Order.
- (3) Special Circumstances. The Director, OFCC, may exempt a contract or subcontract when he finds that special circumstances indicate that use of either of the clauses in 7-103.18 in the contract or subcontract would not be in the national interest.
- (4) Request for Exemptions. The Contracting Officer shall submit a detailed justification for omitting or modifying the clause under (1), (2) or (3) above to the ASD (M&RA) in accordance with Departmental procedures.
- (5) Withdrawal of Exemption by the Director, OFCC. When any contract or subcontract is of a class exempted under this paragraph 12-805, the Director, OFCC, may withdraw the exemption for a specific contract or subcontract or group of contracts or subcontracts when in his judgement such action is necessary or appropriate to achieve the purposes of the Order. Such withdrawal shall not apply to contracts or subcontracts awarded prior to the withdrawal. In procurements entered into by formal advertising or the various forms of restricted formal advertising, such withdrawal shall not apply unless the withdrawal is made more than 10 calendar days before the date set for the opening of the bids.

# 59. CLEAN AIR AND WATER (1975 OCT)(ASPR 7-103.29)

(Applicable only if the contract exceeds \$100,000, or the Contracting Officer has determined that orders under an indefinite quantity contract in any one year will exceed \$100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-8(c)(1) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c) and is listed by EPA, or the contract is not otherwise exempt.)

## A. The Contractor agrees as follows:

- (1) To comply with all the requirements of Section 114 of the Clean Air Act, as amended (42 U.S.C. 1857, et seq., as amended by Public Law 91-604) and Section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251, as amended by Public Law 92-500), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in Section 114 and Section 308 of the Air Act and the Water Act, respectively, and all regulations and guidelines issued thereunder before the award of this contract.
- (2) That no portion of the work required by this prime contract will be performed in a facility listed on the Environmental Protection Agency List of Violating Facilities on the date this contract was awarded unless and until the EPA eliminates the name of such facility or facilities from such listing.
- (3) To use his best efforts to comply with clean air standards and clean water standards at the facilities in which the contract is being performed; and
- (4) To insert the substance of the provisions of this clause in any nonexempt subcontract, including this paragraph (4).

- B. The terms used in this clause have the following meanings:
- (1) The term "Air Act" means the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Public Law 91-604).
- (2) The term "Air Act" means Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Public Law 92-500).
- (3) The term "Clean Air Standards" means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in Section 110(d) of the Clean Air Act (42 U.S.C. 1857c-5(d), an approved implementation procedure or plan under Section 111(c) or Section 111(d), respectively of the Air Act (42 U.S.C. 1857c-6(c) or (d), or an approved implementation procedure under Section 112(d) of the Air Act (42 U.S.C. 1857c-7(d).
- (4) The term "Clean Water Standards" means any enforceable limitation, control, condition, prohibition, standard or other requirement which is promulgated pursuant to the Water Act or obtained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by Section 402 of the Water Act (33 U.S.C. 1342), or by a local government to ensure compliance with pretreatment regulations as required by Section 307 of the Water Act (33 U.S.C. 1317).
- (5) The term "compliance" means compliance with clean air or water standards. Compliance shall also mean compliance with a schedule or plan ordered or approved by a court of competent jurisdiction, the Environmental Protection Agency or an air or water pollution control agency in accordance with the requirement of the Air Act or Water Act and regulations issued pursuant thereto.
- (6) The term "facility" means any building, plant, installation, structure, mine, vessel or other floating craft, location, or site of operations, owned, leased, or supervised by a contractor, subcontractor, to be utilized in the performance of a contract or subcontract. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location or site shall be deemed to be a facility except there the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.
- (7) The term "nonexempt contract or subcontract" means a contract or subcontract of more than \$100,000 which is not otherwise exempted pursuant to the EPA regulations implementing the Air Act and Water Act (40 CFR 15.5), as further implemented in ASPR 1-2302.4 or in FPR 1-1.2302-4 whichever is applicable) and the procedures of the Department awarding the contract.

# 60. CLEAN AIR AND WATER CERTIFICATION (77 JUN) (DAR 7-2003.71)

Applicable if the bid or offer exceeds \$100,000, or the Contracting Officer has determined that orders under an indefinite quantity contract in any year will exceed \$100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-8(c)(1)) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c)) and is listed by EPA, or is not otherwise exempt.

The Bidder or offeror certifies as follows:

- (1) Any facility to be utilized in the performance of this proposed contract <u>is</u> (\_) or <u>is not</u> (\_), listed on the Environmental Protection Agency List of Violating Facilities;
- (2) He will promptly notify the Contracting Officer, prior to award, of the receipt of any communication from the Director, Office of Federal Activities, U. S. Environmental Protection Agency, indicating that any facility which he proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and
- (3) He will include substantially this solicitation certification, including this paragraph (3), in every nonexempt subcontract.

# 61. EXEMPTIONS TO ENVIRONMENTAL PROTECTION CLAUSE (ASPR 1-2302.4) (JUL 76)

Except as provided in (c) below, contracts and subcontracts are exempt from the requirements of this Part and 40 CFR Part 15, as follows:

- A. Contracts and subcontracts not exceeding \$100,000 are exempt.
- B. Contracts and subcontracts for indefinite quantities are exempt if the Contracting Officer determines that the amount to be ordered in any year under such contract will not exceed \$100,000.
- C. Except for small purchases, the foregoing exemptions shall not apply to a proposed contract under which the facility to be used is listed on the EPA List of Violating Facilities on the basis of a conviction either under the Air Act (40 U.S.C. 1857-8(c)(1) or the Water Act (33 U.S.C. 1319(c)).
- D. This part and 40 CFR Part 15 do not apply to the use of facilities located outside the United States. The term "United States," as used herein, includes the States, District of Columbia, Commonwealth of Puerto Rico, Virgin Islands, Guam and American Samoa, and Trust Territories of the Pacific Islands.
- E. Upon a determination that the paramount interest of the United States so requires, the Secretary concerned may except from the provisions of this Part any individual or class of contracts or subcontracts, for a period of one year. Prior to granting a class exemption, the Secretary shall consult with the Director, Office of Federal Activities, United States Environmental Protection Agency. The Secretary granting either an individual contract or class exemption shall notify the Director of such exemption as soon after granting the exemption as practicable. Such notification shall describe the purpose of the contract, and indicate the manner in which the paramount interest of the United States required that the exemption be made.

# 62. AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS (ASPR 7-103.28) (76 MAY)

- A. The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon either physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.
- B. The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- C. In the event of the Contractor's noncompliance with the requirements of this clause, action for noncompliance may be taken in accordance with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.
- D. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the Contracting Officer. Such notices shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.
- E. The Contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.
- F. The Contractor will include the provisions of this clause in every subcontract or purchase order of \$2500 or more unless exempt by rules, regulations, or orders of the Secretary issued pursuant to Section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.

#### 63. COVENANT AGAINST CONTINGENT FEES

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty, the Owner shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

#### 64. OFFICIALS NOT TO BENEFIT

No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

## 65. CONVICT LABOR

In connection with the performance of work under this contract, the Contractor agrees not to employ any person undergoing sentence of imprisonment, as provided by Public Law 89-176, September 10, 1965 (18 U.S.C. 4082(c)(2)) and Executive Order 11755, December 29, 1973.

#### 66. NONDISCRIMINATION IN EMPLOYMENT

In connection with the performance of work under this contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of sex, race, creed, color, or national origin; and further agrees to insert the foregoing provision in all subcontracts hereunder except subcontracts for standard commercial supplies or for raw materials.

# 67. GRATUITIES

- A. The State may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found, after notice and hearing, by the Contracting Officer or Governor or the duly authorized representative of either, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the State with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performance of such contract: Provided, that the existence of the facts upon which the Contracting Officer or Governor or the duly authorized representative of either makes such findings shall be in issue and may be reviewed in any competent court.
- B. In the event this contract is terminated as provided in paragraph (a) hereof, the State shall be entitled (1) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor, and (2) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Contracting Officer or Governor or the duly authorized representative of either) which shall not be less than 3 nor more than 10 times the costs incurred by the Contractor in providing any such gratuities to any such officer or employee.
- C. The rights and remedies of the State provided in this Clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

## 68. COPELAND ("ANTI-KICKBACK") ACT - NONREBATE OF WAGES

The regulations of the Secretary of Labor applicable to contractors and subcontractors (29 CFR, Part 3), made pursuant to the Copeland Act, as amended (40 U.S.C. 276c) and to aide in the enforcement of the Anti-Kickback Act (18 U.S.C. 874) are made a part of this contract by reference. The Contractor will comply with these regulations and any amendments or modifications thereof and the prime contractor will be responsible for the submission of affidavits required of subcontractors thereunder. The foregoing shall apply except as the Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances and exemptions.

#### 69. SUBCONTRACTS - TERMINATION

The Contractor agrees to insert the clauses hereof entitled <u>COPELAND ("ANTI-KICKBACK") ACT-NONREBATE OF WAGES</u>, <u>WITHHOLDING OF FUNDS</u>, and <u>SUBCONTRACTS - TERMINATION</u> physically in all subcontracts and the Contractor further agrees that a breach of any of the requirements of these clauses may be grounds for termination of this contract. The term "contractor" as used in such clauses in any subcontract shall be deemed to refer to the subcontractor except in the phrase "prime contractor."

## 70. AUDIT BY DEPARTMENT OF DEFENSE (1978 AUG)

- A. <u>General</u>. The Contracting Officer or his representatives shall have the audit and inspection rights described in the applicable paragraphs (B), (C) and (D) below.
- B. <u>Examination of Costs</u>. If this is a cost reimbursement type, incentive, time and materials, labor hour, or price redeterminable contract, or any combination thereof, the Contractor shall maintain, and the Contracting Officer or his representatives shall have the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to reflect properly all direct and indirect costs of whatever nature claimed to have been incurred and anticipated to be incurred for the performance of this contract. Such right of examination shall include inspection at all reasonable times of the Contractor's plants, or such parts thereof, as may be engaged in the performance of this contract.
- C. <u>Cost or Pricing Data</u>. If the Contractor submitted cost or pricing data in connection with the pricing of this contract or any change or modification thereto, unless such pricing was based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation, the Contracting Officer or his representatives who are employees of the United States Government shall have the right to examine all books, records, documents and other data of the Contractor related to the negotiation, pricing or performance of such contract, change or modification, for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data submitted. The right of examination shall extend to all documents necessary to permit adequate evaluation of the cost or pricing data submitted, along with the computations and projections used therein.
- D. <u>Reports</u>. If the Contractor is required to furnish Contractor Cost Data Reports (CCDR), Contract Fund Status Reports (CFSR), or Cost Performance Reports (CPR), the Contracting Officer or his representatives shall have the right to examine books, records, other documents, and other supporting materials, for the purpose of evaluating (i) the effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports, and (ii) the data reported.
- E. <u>Availability</u>. The materials described in (B), (C) and (D) above shall be made available at the office of the Contractor, at all reasonable times, for inspection, audit, or reproduction, until the expiration of three (3) years from the date of final payment under this contract or such lesser time specified in Appendix M of the Defense Acquisition Regulation and for such longer period, if any, as is required by applicable statute, or by other clauses of this contract, or by (1) and (2) below:
- (1) If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for a period of three (3) years from the date of any resulting final settlement.
- (2) Records which relate to appeals under the <u>DISPUTES</u> Clause of this contract, or litigation, or the settlement of claims arising out of the performance of this contract, shall be made available until such appeals, litigation, or claims have been disposed of.
- F. The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (F), in all subcontracts exceeding \$10,000 hereunder, except altered as necessary for proper identification of the contracting parties and the Contracting Officer under the State prime contract.

# 71. SUBCONTRACTOR COST OR PRICING DATA - PRICE ADJUSTMENTS (1970 JAN)

A. Paragraphs (B) and (C) of this Clause shall become operative with respect to any modification made pursuant to one or more provisions of this contract which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$100,000. The requirements of this Clause shall be limited to such modifications.

- B. The Contractor shall require subcontractors hereunder to submit cost or pricing data under the following circumstances:
- (1) prior to the award of any subcontract the amount of which is expected to exceed \$100,000 when entered into;
- (2) prior to the pricing of any subcontract modification which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$100,000; except where the price is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation.
- C. The Contractor shall insert the substance of this clause including this paragraph (C) in each subcontract which exceeds \$100.000.

# 72. BUY AMERICAN ACT (1966 OCT)

- A. <u>Agreement</u>. In accordance with the Buy American Act (41 U.S.C. I0a I0d), the Contractor agrees that only domestic construction material will be used (by the Contractor, subcontractors, materialmen, and suppliers) in the performance of this contract, except for non-domestic construction material listed in the "Nondomestic Construction Materials" clause, if any, of this contract.
- B. <u>Domestic construction material</u>. "Construction material" means any article, material, or supply brought to the construction site for incorporation in the building or work. An unmanufactured construction material is a "domestic construction material" if it has been mined or produced in the United States. A manufactured construction material is a "domestic construction material" if it has been manufactured in the United States and if the cost of its components which have been mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. "Component" means any article, material, or supply directly incorporated in a construction material.
- C. <u>Domestic component</u>. A component shall be considered to have been mined, produced, or manufactured in the United States" (regardless of its source in fact) if the article, material, or supply in which it is incorporated was manufactured in the United States and the component is of a class or kind determined by the Government to be not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality.
- D. <u>Non-Domestic construction material</u>. The Contractor/Vendor agrees that it will not expend any funds appropriated by Congress without complying with The Buy American Act (41 U.S.C. 10). The Buy American Act gives preference to domestic end products and domestic construction material. In addition, the Memorandum of Understanding between the United States of America and the European Economic Community on Government Procurement, and the North American Free Trade Agreement (NAFTA), provide that EC and NAFTA end products and construction materials are exempted from application of the Buy American Act.

#### 73. APPROVAL

This contract and any subsequent terminations, modifications, or change orders (including those resulting from disputes and settlements of disputes) shall be subject to the written approval of the Chief, National Guard Bureau, or his duly authorized representative, and shall not be binding until so approved.

#### 74. SUBJECT TO FEDERAL-STATE AGREEMENT

This contract is subject to all terms and conditions of the Federal-State Agreement between the United States of America and the State of Alabama.

## 75. RELATIONSHIP OF THE FEDERAL GOVERNMENT

This contract is funded in part by the Federal Government. The Federal Government is not a party to this contract. As a condition to receiving and expending Federal funds, there are certain rights of Federal inspection, Federal approval of contract changes and modifications, and Federal approval of settlements or dispute actions that the Federal Government will exercise prior to authorization of Federal funds. Therefore, no inspection or acceptance, change, modification, settlement, dispute claim payment, or dispute action will be

considered binding until the required Federal approval is obtained. The Chief, National Guard Bureau, or his designated representative, is the approval authority. This paragraph does not abrogate any rights conferred on the Federal Government by law or other clause required due to the use of Federal funding.

# 76. SUSPENSION OF WORK (1968 FEB) (DAR 7-602.46)

- A. The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as he may determine to be appropriate for the convenience of the Owner.
- B. If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Contracting Officer in the administration of this contract, or by his failure to act within the time specified in this contract (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent (1) that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or (2) for which an equitable adjustment is provided for or excluded under any other provision of this contract.
- C. No claim under this clause shall be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in a amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay, or interruption, but not later than the date of final payment under the contract.

# 77. TERMINATION FOR CONVENIENCE OF THE OWNER - CONSTRUCTION (1974 APR) (DAR 7-602.29)

- A. The performance of work under this contract may be terminated by the Owner in accordance with this clause in whole, or from time to time in part, whenever the Contracting Officer shall determine that such termination is in the best interest of the Owner. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective.
- B. After receipt of a Notice of Termination, and except as otherwise directed by the Contracting Officer, the Contractor shall:
- (1) Stop work under the contract on the date and to the extent specified in the Notice of Termination;
- (2) Place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the work under the contract as is not terminated;
- (3) Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;
- (4) Assign to the Owner, in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Owner shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;
- (5) Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Contracting Officer, to the extent he may require, which approval or ratification shall be final for all the purposes of this clause;
- (6) Transfer title and deliver to the Owner, in the manner, at the times, and to the extent, if any, directed by the Contracting Officer, (a) the fabricated or unfabricated parts, work in process, completed work, supplies, and other materials produced as a part of, or required in connection with the performance of, the work terminated by the Notice of Termination, and (b) the completed or partially completed plans,

drawings, information, and other property which, if the contract had been completed, would have been required to be furnished to the Owner;

- (7) Use his best efforts to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in (6) above; provided, however, that the Contractor (a) shall not be required to extend credit to any purchaser, and (b) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Contracting Officer; and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Owner to the Contractor under this contract or shall otherwise be credited to the price or cost of the work covered by this contract or paid in such other manner as the Contracting Officer may direct;
- (8) Complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and
- (9) Take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to this contract which is in the possession of the Contractor and in which the Owner has or may acquire an interest.

At any time after expiration of the plant clearance period, as defined in Section VIII, Armed Services Procurement Regulation, as it may be amended from time to time, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and may request the Owner to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Owner will accept title to such items and remove them or enter into a storage agreement covering the same; provided, that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or if the items are stored, within forty-five (45) days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.

- C. After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer his termination claim, in the form and with certification prescribed by the Contracting Officer. Such claim shall be submitted promptly but in no event later than one year from the effective date of termination, unless one or more extensions in writing are granted by the Contracting Officer, upon request of the Contractor made in writing within such one year period or authorized extension thereof. However, if the Contracting Officer determines that the facts justify such action, he may receive and act upon any such termination claim at any time after such one year period or any extension thereof. Upon failure of the Contractor to submit his termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.
- D. Subject to the provisions of paragraph C, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination of work pursuant to this clause, which amount or amounts may include a reasonable allowance for profit on work done; provided, that such agreed amount or amounts, exclusive of settlement costs, shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount. Nothing in paragraph E of this clause, prescribing the amount to be paid to the Contractor in the event of failure of the Contractor and the Contracting Officer to agree upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, shall be deemed to limit, restrict, or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the Contractor pursuant to this paragraph D.
- E. In the event of the failure of the Contractor and the Contracting Officer to agree, as provided in paragraph D, upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, the Contracting Officer shall pay to the Contractor the amounts determined by the Contracting Officer as follows, but without duplication of any amounts agreed upon in accordance with paragraph D:
- (1) With respect to all contract work performed prior to the effective date of the Notice of Termination, the total (without duplication of any items) of:

- (a) the cost of such work;
- (b) the cost of settling and paying claims arising out of the termination of work under subcontracts or orders as provided in paragraph B(5) above, exclusive of the amounts paid or payable on account of supplies or materials delivered or services furnished by the subcontractor prior to the effective date of the Notice of Termination of Work under this contract, which amounts shall be included in the cost on account of which payment is made under (A) above, and
- (c) a sum, as profit on "a" above, determined by the Contracting Officer pursuant to 8-303 of the Armed Services Procurement Regulation, in effect as of the date of execution of this contract, to be fair and reasonable; provided, however, that if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, no profit shall be included or allowed under this subdivision "c" and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss; and
- (2) The reasonable cost of the preservation and protection of property incurred pursuant to paragraph B(9); and any other reasonable cost incidental to termination of work under this contract, including expense incidental to the determination of the amount due to the Contractor as the result of the termination of work under this contract.

The total sum to be paid to the Contractor under (1) above shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. Except for normal spoilage, and except to the extent that the Owner shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor under (1) above, the fair value, as determined by the Contracting Officer, of property which is destroyed, lost, stolen, or damaged so as to become undeliverable to the Owner, or to a buyer pursuant to paragraph B(7).

- F. Costs claimed, agreed to, or determined pursuant to C, D, E, and I hereof shall be in accordance with Section XV of the Armed Services Procurement Regulation as in effect on the date of this contract.
- G. The Contractor shall have the right of appeal, under the clause of this contract entitled "Disputes", from any determination made by the Contracting Officer under paragraph C, E, or I hereof, except that if the Contractor has failed to submit his claim within the time provided in paragraph C or I hereof, and has failed to request extension of such time, he shall have no such right of appeal. In any case where the Contracting Officer has made a determination of the amount due under paragraph C, E, or I hereof the Owner shall pay to the Contractor the following: (1) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or (2) if an appeal has been taken, the amount finally determined on such appeal.
- H. In arriving at the amount due the Contractor under this clause there shall be deducted (1) all unliquidated advance or other payments on account theretofore made to the Contractor, applicable to the terminated portion of this contract, (2) any claim which the Owner may have against the Contractor in connection with the contract, and (3) the agreed price for, or the proceeds of sale of any materials, supplies, or other things acquired by the Contractor or sold, pursuant to the provisions of this clause, and not otherwise recovered by or credited to the Owner.
- I. If the termination hereunder be partial, the Contractor may file with the Contracting Officer a claim for an equitable adjustment of the price or prices specified in the contract relating to the continued portion of the contract (the portion not terminated by the Notice of Termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices. Any claim by the Contractor for an equitable adjustment under this clause must be asserted within ninety (90) days from the effective date of the termination notice, unless an extension is granted in writing by the Contracting Officer.
- J. The Owner may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of this contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this clause, such excess shall be payable by the Contractor to the Owner upon demand, together with interest computed at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41, 85 STAT 97 for the Renegotiation Board for the period from the date such excess payment is received by the Contractor to the date on which

such excess is repaid to the Owner; provided, however, that no interest shall be changed with respect to any such excess payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition, or such later date as determined by the Contracting Officer by reason of the circumstances.

K. Unless otherwise provided for in this contract, or by applicable statute, the Contractor shall--from the effective date of termination until the expiration of three years after final settlement under this contract-preserve and make available to the Owner at all reasonable times at the office of the Contractor but without direct charge to the Owner, all his books, records, documents and other evidence bearing on the costs and expenses of the Contractor under this contract and relating to the work terminated hereunder, or, to the extent approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions thereof.

#### 78. USE OF UNITED STATES FLAG VESSELS

- A. To use privately-owned United States flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo lines, and tankers) of any equipment, materials, or commodities that are both (1) procured, contracted for, or otherwise obtained with funds made available by State under this contract, and (2) transported by ocean vessel, to the extent such vessels are available at fair and reasonable rates;
- B. To furnish within 20 working days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, "on-board" commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph A above to both State and to the Division of National Cargo, Office of Market Development, U.S. Maritime Administration, Washington, D.C. 20590; and,
- C. Subject to existing contracts, to insert the substance of the provisions of this section in all contracts issued pursuant to this contract, and to cause such provisions to be inserted in all subcontracts issued pursuant to this contract, where the contract or subcontract is for \$100,000 or more and where there is a possibility of ocean transportation of procured equipment or materials.

#### 79. DEBARMENT AND SUSPENSION

- A. Contractor/Vendor shall not make any award or permit any award (subgrant or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549, "Debarment and Suspension."
- B. The Final Rule, Government-Wide Debarment and Suspension (Nonprocurement), issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 25) to implement the provisions of Executive Order 12549, "Debarment and Suspension" is incorporated by reference and the Contractor/Vendor covenants and agrees to comply with all provisions thereof, including any amendments to the Final Rule that may hereafter be issued.

#### 80. NONDISCRIMINATION

- A. The Contractor/Vendor covenants and agrees that no person shall be denied benefits of, or otherwise be subjected to discrimination in connection with the Contractor/Vendor's performance under this MCA, on the ground of race, religion, color, national origin, sex or handicap. Accordingly and to the extent applicable, the Contractor/Vendor covenants and agrees to comply with the following:
- (1) Title VII of the Civil Rights Act of 1964 (42 U.S.C. 2000d <u>et seq.</u>), and DOD Regulations (32 CFR Part 300) issued thereunder;
- (2) Executive Order 11246 and Department of Labor Regulations issued thereunder (41 CFR Part 60);
- (3) Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and DOD Regulations issued thereunder (32 CFR Part 56); and,
- (4) The Age Discrimination Act of 1975 (42 U.S.C. 6101 <u>et seq.</u>) and DOD Regulations issued thereunder (45 CFR Part 90).

#### 81. LOBBYING

- A. The Contractor/Vendor covenants and agrees that it will not expend any funds appropriated by Congress to pay any person for influencing or attempting to influence an officer or employee of any agency, or a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; and, the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- B. The Interim Final Rule, New Restrictions on Lobbying, issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 28) to implement the provisions of Section 319 of Public Law 101-121 (31 U.S.C. 1352) is incorporated by reference.

#### 82. DRUG-FREE WORK PLACE

- A. The Contractor/Vendor covenants and agrees that it will comply with the provisions of the Drug-Free Work Place Act of 1988 (Public Law 100-690, Title V, Subtitle D; 41 U.S.C. 701 <u>et seq.</u>) and maintain a drug-free workplace.
- B. The Final Rule, Government-Wide Requirements for Drug-Free Workplace (Grants), issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 28, Subpart f) to implement the provisions of the Drug-Free Work Place Act of 1988 is incorporated by reference and the Contractor/Vendor covenants and agrees to comply with all the provisions thereof, including any amendments to the Final Rule that may hereafter be issued.

#### 83. ENVIRONMENTAL STANDARDS

- A. The Contractor/Vendor agrees that its performance under this contract shall comply with: the requirements of Section 114 of the Clean Air Act (42 U.S.C. § 7414) and Section 308 of the Federal Water Pollution Control Act (33 U.S.C. § 1318), that relate generally to inspection, monitoring, entry reports, and information, and with all regulations and guidelines issued thereunder; the Resources Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation and Liabilities Act (CERCLA); the National Environmental Policy Act (NEPA); and any applicable Federal, Contractor/Vendor or Local environmental regulation.
- B. The Contractor/Vendor shall insure that no facility used in its performance under this contract is listed on the Environmental Protection Agency (EPA) list of violating facilities pursuant to 40 CFR Part 15 without the concurrence of State. The Contractor/Vendor shall notify State of the receipt of any communication from EPA indicating that a facility to be or being used in its performance under this contract is under consideration for listing on the EPA list of violating facilities.
- C. For the purposes of this section, State agrees that the Contractor/Vendor's obligations in Paragraphs a. and b. of this section above shall not apply to any armory, base, training site, or other facility or portion thereof, the operation and maintenance of which is funded under this contract, that is currently listed as a violating facility, on the effective date of this contract, pursuant to 40 CFR Part 15; nor, shall such listing be the basis for State's termination for cause of this contract or for State's disallowance of any cost otherwise allowable under this contract. The Contractor/Vendor and State agree to cooperate to remediate, as expeditiously as possible, for any facility the operation and maintenance of which is within the scope of this contract, the condition giving rise to the listing of any such facility as a violating facility according to applicable statutes, regulations, or other agreements subject to the availability of funds.

## 84. NATIONAL HISTORIC PRESERVATION

Any construction, acquisition, modernization, or other activity that may impact a historic property.

A. The Contractor/Vendor agree to identify to the awarding agency any property listed or eligible for listing on the National Register of Historic Places that will be affected by this award, and to provide any help the awarding agency may need, with respect to this award, to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470, et seq.), as implemented by the Advisory Council on Historic Preservation regulations at 36 CFR Part 800 and Executive Order 11593 (3 CFR, 1971-1975 Comp., p. 559).

36 CFR Part 800 requires Grants Officers to get comments from the Advisory Council on Historic Preservation before proceeding with Federally assisted projects that may affect properties listed on or eligible for listing on the National Register of Historic Places.

#### 85. HATCH ACT

A. The Contractor/Vendor agrees to comply with the Hatch Act (5 U.S.C. 1501 - 1508 and 7324 - 7328), as implemented by the Office of Personnel Management at 5 CFR Part 151, which limits political activity of employees or officers of State or local governments whose employment is connected to an activity financed in whole or part with Federal funds.

# 86. CARGO PREFERENCE

Any agreement under which international air travel may be supported by U.S. Government funds.

A. Travel supported by U.S. Government funds under this agreement shall use U.S.-flag air carriers (air carriers holding certificates under 49 U.S.C. 41102) for international air transportation of people and property to the extent that such service is available, in accordance with the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118) and the interpretative guidelines issued by the Comptroller General of the United States in the March 31, 1981, amendment to Comptroller General Decision B138942.

#### 87. RELOCATION AND REAL PROPERTY ACQUISITION

A. The Contractor/Vendor agrees that it will comply with the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601 et seq.) and regulations issued thereunder (49 CFR Part 24).

#### 88. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

A. The Contractor/Vendor agrees that it will comply with Sections 103 and 107 of the Contract Work Hours and Safety Standards (40 U.S.C. 327-330) as supplemented by Department of Labor regulations (29 CFR Part 5). As applied to this agreement, the Contract Work Hours and Safety Standards Act specifies that no laborer or mechanic doing any part of the work contemplated by this agreement shall be required or permitted to work more than 40 hours in any workweek unless paid for all additional hours at not less than 1 1/2 times the basic rate of pay. This Act is applicable to any construction contract awarded in excess of \$2,000, and in excess of \$2,500 for other contracts which involve the employment of mechanics or laborers.

#### 89. DAVIS-BACON ACT

When required by Federal assistance program legislation, such as the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, environmental remediation construction, the following provision applies.

A. The Contractor/Vendor agrees that it will comply with the Davis-Bacon Act (40 U.S.C. 276a to a-7) as supplemented by U.S. Department of Labor regulations (29 CFR Part 5). All rulings and interpretations of the Davis-Bacon Acts contained in 29 CFR Part 5 are incorporated by reference in this agreement. As applied to this agreement, the Davis-Bacon Act (40 U.S.C. 276a-276a-7) provides that contracts in excess of \$2,000 to which the Federal Government provides assistance funding for construction, alteration, or repair (including painting and decorating) of public buildings or public works within the United States, shall contain a provision that no laborer or mechanic employed directly upon the site of the work shall receive less than the prevailing wage rates as determined by the U.S. Secretary of Labor.

## 90. STATE ADDENDUM

A. "It is agreed that the terms and commitments contained herein shall not constitute a debt of The State of Alabama in violation of Article II, Section 213 of the Constitution of Alabama, 1901, as amended by Amendment 26. It is further agreed that if any provision of this contract shall contravene any statue, constitutional provision or amendment to the Constitution, now in effect or which may, during the course of this contract be enacted. Then that conflicting provision in the contract shall be deemed null and void."

- B. "The Contractor's sole remedy for settlement or any and all disputes arising under the Terms of this agreement shall be limited to filing a claim with The Board of Adjustment for the State of Alabama."
- C. "In event of proration of the fund from which payment under this contract is to be made; the contract will be subject to termination."
- D. "The Contractor acknowledges and understands this contract is not effective until it has received all requisite state government approvals and the Contractor shall not begin performance until notified to do so by State Property & Disbursing Office. The Contractor shall not be entitled to compensation for work performed prior to effective date of contract."

#### SECTION 00 73 00 - SPECIAL CONDITIONS OF THE CONTRACT

The following special conditions modify, change, delete, or add to the "General Conditions of the Contract", (June 2009) Section 00 72 00. Where any Article, Paragraph, or Clause of the General Conditions is modified or deleted by the Special Conditions, the unaltered provisions of that Article, Paragraph, or Clause remain in effect. These Special Conditions shall take precedence over and modify all other specification provisions to the extent in which there may be any conflict.

#### PARAGRAPH 2. DEFINITIONS, INTENT, CORRELATION, AND STREAMLINING

## 2.C(1) Modify the "Order of Precedence" as follows:

- (a) The Contract Agreement
- (b) Addenda, with those of later date having precedence over those of earlier date.
- (c) Special Conditions (or other Conditions which modify the General Conditions of the Contract).
- (d) General Conditions of the Contract
- (e) The Detailed Specification Requirements
- (f) Details appearing on the Drawings; large scale details shall take precedence over smaller scale details.
- (g) The Working Drawings; large scale drawings shall take precedence over smaller scale drawings.

# 2.C(5) Add the following:

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.

# PARAGRAPH 14. PROTECTION OF WORK AND PROPERTY

## Add the following:

This project location/site is normally used as a U. S. Military facility.

If U. S. Military personnel are remaining in tenancy, the Contractor shall be required, for the duration of the project, to maintain the level of security that exists at the project site at the Notice to Proceed date. The Contractor shall make certain that at the end of each workday all doors, windows, walls penetrations, fencing, etc. is completely secured to prevent intruders, etc. In the event that the facility cannot be secured via Owner approved: locks, temporary partitions, etc. then the Contractor shall provide at his expense, a qualified security guard (pre-approved in writing by the Owner) to protect the site or building. Failure to maintain the security of the facility can be considered grounds for dismissal from the project.

For facilities where U. S. Military personnel are remaining in tenancy, the general operating hours of this facility are approximately 7:00 a.m. to 5:30 p.m. Tuesday - Friday. In the event that the Contractor must conduct work outside of the typical operating hours of the facility the Contractor must notify and request in writing to the Owner and Architect a minimum of five days prior to the time that Contractor desires to work. The Contractor shall not work outside typical operating hours unless it is approved, in writing, by the Owner.

The provisions in the previous two paragraphs can be modified by the Owner. These provisions may also be modified by Addenda.

The Contractor shall not permit a load to be applied, or forces introduced, to any part of the existing or new 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.

#### PARAGRAPH 19. CHANGES IN THE WORK

## Modify per the following:

A. By mutually agreed price or prices which will be added to or deducted from the Contract Price. Additions to the contract price shall include the Contractor's overhead and profit but shall not exceed 15 percent. Where subcontract work is involved, the total mark-up for the Contractor and subcontractors shall not exceed 25%. This percentage allowance for overhead and profit shall include the cost of superintendent, timekeeper, clerks, watchmen, use of small tools, incidental job burdens, and general office expenses. There will be no additional or separate charges for these items. No allowance for overhead and profit shall be figured on any change which involves a net credit to the Owner. Changes which involve a net credit to the Owner shall include credits for overhead and profit on the deducted work.

## PARAGRAPH 28. APPLICATIONS FOR PARTIAL AND FINAL PAYMENTS

## Add the following:

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 site, may also be considered in Partial Applications for Payment under the following conditions:

- (1) the contractor has received written approval from the Owner to store the materials or equipment off site in advance of delivering materials to the off-site location;
- (2) a Certificate of Insurance is furnished to, and accepted by, the Owner 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 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 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.

#### FINAL ACCEPTANCE of the WORK

Final Completion or Final Acceptance of the Work shall be achieved when all work including all "punch list" items recorded have been fully completed or corrected and accepted by the Owner and Architect.

#### PREREQUISITES to FINAL PAYMENT

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

- (1) Full execution of the Certificate of Final Completion for the Work.
- (2) The Contractor's completion, to the satisfaction of the Architect and Owner, of all documentary requirements identified in sections 01 77 00 Project Closeout and 01 78 13 Project Closeout Checklist.

# PARAGRAPH 89. DAVIS BACON ACT

Delete this paragraph in its entirety.

# **ADD THE FOLLOWING PARAGRAPH:**

# PARAGRAPH 91. ADDITIONAL GENERAL CONTRACTOR ONE YEAR WARRANTY ITEMS

- 1. The General Contractor is required to provide the Manufacturer's recommended preventative maintenance, including inspections, for ALL items installed or refurbished in this project for a period of ONE year from the date of final acceptance.
- 2. The General Contractor will perform the preventative maintenance and inspections per Manufacturer's recommended intervals for each item.
- 3. The General Contractor will provide the Owner written documentation that the required preventative maintenance and inspections have been performed. This documentation will be provided at each Manufacturer's recommended interval and verified by the owner or tenant of each facility.

#### **END OF SECTION**

# SECTION 01 10 00 - SUMMARY OF WORK

(Revision Date: 17 August 2021)

# PART 1 GENERAL

# 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work in this section.

# 1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Project consists of work as described in the drawings and specifications entitled: Huntsville Readiness Center prepared by Seay Seay & Litchfield, P.C., dated November 1, 2024.
- B. The types of work specified in this section include the following:
  - 1. Furnishing of all labor, materials, tools, equipment, staging areas, hoisting, qualified personnel and proper supervision for the work described in the drawings and specifications.
  - 2. Protection of the buildings, grounds, building personnel and visitors.
- C. Work to be performed under a single prime contract.

#### 1.03 WORK UNDER OTHER CONTRACTS

- A. The Owner may at times have other work in progress at the site.
- B. Contractor shall cooperate fully with separate contractors (if any) so that work under those contracts may be carried out smoothly, without interfering with or delaying work under either contract.

# 1.04 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have access to all areas of the building where work is to be undertaken.

# B. OWNER OCCUPANCY

1. Reference Section 00 73 00 – Special Conditions of the Contract, Paragraph 14.

# 1.05 JOB CONDITIONS

- A. Coordinate all work under this contract with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of the work and protection of materials and finishes.
- B. The Contractor is responsible for the water tightness of the Existing Building during the construction contract period (after work of this contract begins). In the event the Contractor fails to maintain buildings in a watertight condition, the Contractor shall be responsible for any damage caused to the Owner's property.

SUMMARY OF WORK 01 10 00-1

- C. In the event emergency action must be taken by the Owner's maintenance forces to protect property, due to the Contractor's failure to maintain buildings in a watertight condition, the Contractor shall be responsible for all of the Owners' labor and materials cost incurred due to emergency action and he shall reimburse the Owner for such cost by standard Change Order procedure.
- D. Work under this contract must be completed in a continuous fashion. If the Contract Documents show phased work, the phasing plan must be followed, unless the Contractor has requested, and received, written approval from the Owner to deviate from the phasing plan shown in the Contract Documents.

# E. CONTRACTOR USE OF SITE AND PREMISES

- 1. Provide access to and from site as required by law and by Owner:
  - a. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
  - b. Do not obstruct roadways, sidewalks, or other public ways without permit.

# PART 2 PRODUCTS - NOT USED

#### PART 3 EXECUTION

# 3.01 WORK SEQUENCE

- A. The Notice to Proceed (NTP) is <u>14</u> calendar days from the email delivery of the fully executed contract to the Contractor, unless otherwise agreed upon, in writing, by the Owner and the Contractor.
- B. Contract Time begins at the NTP.
- C. Perform all work in not to exceed **610 Calendar Days** in accordance with the following (calculated as the sum of 3.01.C.1 through 3.01.C.2. [inclusive]):
  - 1. The Contractor has <u>565</u> calendar days to perform all Work, including but not limited to the following: providing all required operator training, the "Punch-List Inspection", correcting all deficiencies noted in the "Punch-List Inspection", and successful completion of the Final Inspection with no noted deficiencies.
  - 2. The Contractor has <u>45</u> days, from 3.01.C.1. (above), to have submitted a complete Project Closeout package, as detailed and defined in Sections 01 77 00 and 01 78 13.

# 3.02 LIQUIDATED DAMAGES

- A. If final completion is not achieved within the time for contraction noted above, liquidated damages will be assessed in the amount of 6% per annum.
- B. The liquidated damages assessed will be deducted from the final pay application prior to payment by the Owner.

#### END OF SECTION

SUMMARY OF WORK 01 10 00-2

## SECTION 01 2100 - ALLOWANCES

# PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Allowance Schedule.

# 1.02 RELATED REQUIREMENTS

A. Section 01 2900 Payment Procedures: Additional payment and modification procedures.

# 1.03 CONTINGENCY ALLOWANCE

- A. Refer to Schedule of Allowances for Allowances and monetary amounts of each allowance to be included in the contractor's base bid.
- B. All Contingency Allowances include 25% overhead and profit, as defined by General Conditions Paragraph 19A. Contractors will comply with General Conditions Paragraph 19 when submitting allowance pricing.
- C. After testing needs have been identified and examined and the scope of work and method of testing determined, or a 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.
- D. The Contractor shall include a line item in the Schedule of Values entitled "Contingency Allowance" with values as scheduled below. The estimated value of work completed pursuant to fully executed Contingency Allowance Authorizations may be included in the Contractor's monthly Applications for Payment.
  - 1. When a contingency allowance includes multiple items of work, each item of work shall be listed as a separate line item in the schedule of values with the approximate percentage complete for each scope of work listed.
- E. The owner may, at his discretion, transfer balance of any contingency to another allowance.

F. 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.

# 1.04 ALLOWANCES SCHEDULE

- A. Aid to Construction: Water/Sewer (Base Bid). Include in the stipulated sum of \$225,000.00 for use to provide connections paid to the utility provide for connection to city water and sewer service.
- B. Aid to Construction: Power (Base Bid). Include in the stipulated sum of \$75,000.00 for use to provide connections paid to the utility provide for connection to power service.
- C. Aid to Construction: Gas (Base Bid). Include in the stipulated sum of \$60,000.00 for use to provide connections paid to the utility provide for connection to gas service.
- D. Aid to Construction: Bi-Directional Amplifer (Base Bid). Include in the stipulated sum of \$125,000.00 for use to provide preliminary and final testing for a Bi-Directional Amplifer (BDA) system. If a BDA is required then this Allowance will cover design and installation of new system. If a BDA is found to not be required then remainder of Allowance shall be credited back to Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

**END OF SECTION 01 2100** 

# **SECTION 01 22 00 - UNIT PRICES**

#### **PART 1 - GENERAL**

# 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-01 Specification sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for unit prices.
  - A unit price is an amount proposed by Bidders and stated on the Proposal Form as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Contract Modification in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.
  - 2. Unit prices include all necessary material, overhead, and profit. Unit Prices shall not include any sales tax.
  - 3. Refer to the individual Specification Sections for construction activities requiring the establishment of unit prices.
- B. Schedule: A "Unit Price Schedule" included on the Proposal Form. Specification Section contains requirements for materials and methods described under each unit price.
  - 1. The Owner reserves the right to reject the Contractor's measurement of work-inplace that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.

# PART 2 - PRODUCTS (NOT APPLICABLE)

# PART 3 - EXECUTION

3.01 U	NIT F	PRICE SCHEDULE, (TO BE QUOTE	D ON THE PROPOSAL FORM)
A.		IT PRICE NO. 1:  Cost per cubic yard \$  Soils and Replace with Select Fill.	_ for Undercutting and Removal of Unsuitable
В.		IT PRICE NO 2:  Cost per square yard \$  ALDOT 825 Type A or B Graded Ag	for providing and completely installing 8" ggregate Base with Filter Fabric.
C.		IT PRICE NO 3:  Cost per square yard \$  Heavy Duty Concrete Paving.	for providing and completely installing

## END OF SECTION

UNIT PRICES 01 22 00-1

#### SECTION 01 23 00 - ALTERNATES

#### PART 1 – GENERAL

# 1.01 SUMMARY

A. Section Includes: Administrative and procedural requirements for Additive Alternates.

#### 1.02 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

#### 1.03 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

# PART 2 - PRODUCTS (NOT USED)

# **PART 3 – EXECUTION**

## 3.01 SCHEDULE OF ALTERNATES

A. Bid Item A: All work as indicated as part of the Readiness Center and General Purpose Training Bay Building. All site work is considered part of Bid Item A with the exception of the work noted as Alternate Bid Items listed Below:

ALTERNATES 01 23 00-1

- a. Alternate Bid Item A-1: Paving Military Owned Vehicle (MOV) Access Road refer to Civil Drawings.
- b. Alternate Bid Item A-2: Military Owned Vehicle (MOV) Parking Loading Ramp refer to Civil Drawings.
- c. Alternate Bid Item A-3: Military Owned Vehicle (MOV) Parking Truck Containment Pad refer to Civil Drawings.

# **END OF SECTION**

ALTERNATES 01 23 00-2

#### SECTION 01 25 13 - PRODUCT SUBSTITUTION PROCEDURES

## **PART 1 - GENERAL:**

# 1.01 SUMMARY

- A. Section Includes: Administrative and procedural requirements for handling requests for substitutions made AFTER award of the Contract.
- B. Related Sections:
  - 1. 00 43 25 Substitution Request Form During Bidding.
  - 2. 00 72 00 General Conditions of the Contract
  - 3. 01 25 14 Substitution Request Form During Construction.
  - 4. 01 33 00 Submittal Procedures

# 1.02 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

# 1.03 SUBMITTALS

- A. Substitution Request Form: Submit all substitution requests using the form provided in this Project Manual. Use Section 01 25 14 Substitution Request Form During Construction.
  - 1. Product substitutions will NOT be considered after award of the Contract unless the above substitution form is used.
  - 2. Architect will reject incomplete forms.
- B. Substitution Requests: Submit three (3) copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number(s), Specification Section title(s), Drawing number(s), and Drawing title(s).
  - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified material or product 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 the Owner.
- 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.
- 1. 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.
- 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution.

# **PART 2 – PRODUCTS**

#### 2.01 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution if received within twenty (20) days after 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 when the following conditions are satisfied. If the following conditions are not satisfied, 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 does not require extensive revisions 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.
- C. Exceptions: The following are not considered substitutions and are not subject to requirements specified in this Section:
  - 1. Substitutions requested during the Bidding period, and accepted via Addenda.
  - 2. Revisions to Contract Documents requested by the Owner.
  - 3. Specified options on products and construction methods included in Contract Documents.

# PART 3 - EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 25 14 - SUBSTITUTION REQUEST FORM DURING CONSTRUCTION

(Revision Date: 14 Jan 2021)

CONTRACTOR SHALL USE THIS FORM FOR SUBMITTING SUBSTITUTION REQUEST AFTER AWARD OF CONTRACT. OTHER FORMS OF SUBSTITUTION REQUESTS WILL NOT BE CONSIDERED.

Project: Huntsville Contract #:		Substitution Request I	Number:
Architect: Seay Sea 1115 South Court St	y and Litchfield, P.C.		
Montgomery, AL 361			
From:		_	
Re:		<u> </u>	
Specification Title:			Section:
Description:		Page: A	rticle/Paragraph:
Proposed Substitution:			
Manufacturer:	Address:		Phone:
Trade Name:		Mod	lel No.:
Installer:	Address:		Phone:
History: New Pro	oduct 1 – 4 years old	5 – 10 years old	Exceeds 10 years old
Differences between	proposed substitution and	specified product:	
Point by Point comp	arative data attached:		

Huntsville Readiness Center Huntsville, AL	SS&L# 21112	November 1, 2024
Reason for not providing specified	item:	
Similar Installation:		
Project:	Architect:	
Address:		
	Date Installed:	
Rough order of magnitude of the sa	avings to Owner for accepting sub	stitution: (\$)
Proposed substitution changes Co	ntract Time:No Yes [Add]	[Deduct] days.
	bstitution request by the Owner wi	
	quest in accordance with the Gene	
	ner reject the change order reques e Contractor must comply with the	
	the Substitution Request was reje	

Tests

Reports

**Supporting Data Attached:** 

**Product Data** 

Samples

**Drawings** 

### The Undersigned Certifies:

Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product. Same warranty will be furnished for proposed substitution as for specified product. Same maintenance service and source of replacement parts, as applicable, is available. Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule. Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are waived. Proposed substitution does not affect dimensions and functional clearances. Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution. Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete by the Contractor in all respects.

Submitted By:	
Firm:	
Address:	
	Fax:
	Website:
Attachments:	
Substitution recommended for Accep Substitution recommended for Rejec	tion to be completed by Architect/Engineer)  otance by the Owner (Strikethrough if NOT applicable) tion by the Owner (Strikethrough if NOT applicable)  Date:
Substitution recommended for Accep Substitution recommended for Rejec Signed By:	otance by the Owner (Strikethrough if NOT applicable)
Substitution recommended for Acception Substitution recommended for Rejection Signed By:	otance by the Owner (Strikethrough if NOT applicable) tion by the Owner (Strikethrough if NOT applicable)  Date:  Section to be completed by Owner's KO/COR)  (Strikethrough if NOT applicable)

**END OF SECTION** 

# SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES PART 1 - GENERAL

# 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

# 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
  - Specification 00 72 00 General Conditions of the Contract, Specification 00 73 00 Special Conditions of the Contract and Specification 01 26 14 Change Order Recap Form.

# 1.03 MINOR CHANGES IN THE WORK

A. All changes in the Work will only be authorized by a fully executed Contract Modification Form, executed by both the Contractor and the Owner, or as otherwise authorized by the General Conditions of the Contract.

# 1.04 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Owner will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Owner 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 Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change. The submission shall include:
    - a. 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. Indication of applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Costs of labor directly attributable to the change.
    - d. 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. Other requirements of the General Conditions of the Contract.
    - f. Change Order Request Recap Form (01 26 14) completed by the Contractor.
    - g. Submission will be made as one complete packet, via electronic mail, to the Architect.

- 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. The submission shall include:
    - a. 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. Indication of applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Costs of labor directly attributable to the change.
    - d. 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. Other requirements of the General Conditions of the Contract.
    - f. Change Order Request Recap Form (01 26 14) completed by the Contractor.
    - g. Submission will be made as one complete packet, via electronic mail, to the Architect.
- B. Proposal Request Form: Request for Proposal will be on Owner's approved form.

#### 1.05 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, the Owner will issue a Contract Modification for signatures of Owner, Surety and Contractor on Owner's "Contract Modification / Supplemental Agreement Form".

PART 2 - PRODUCTS (NOT USED)

**PART 3 - EXECUTION (NOT USED)** 

END OF SECTION

## 01 26 14 CHANGE ORDER RECAP FORM

Date   Contractor Name   Project Name   Project Name   Contract Name   Project Name   Contract Name   Contra			С	hang	je Propos	sal Recap	Sheet					
Project Name:												
Contract Number   Initiated By:   Chreat One   Contractor   Contract								_				
Cinced Cheel   Contractor   Subcontractor						Initiated Dur	0	_ .unar/Arabitaat				
Subcontractor   Subcontracto	Contract Number .				_	(Check One)	O					
	eference RFP or RFI Number:				-	,						
Item/Description   Quantity   Unit   Unit   S   S0.00   S0.0					_							
Item/Description *	rief Description of Proposed Change:	-										
Item/Description *												
Item/Description		GE	NERAL CON	TRAC	TOR Direct (	Cost Summar		ount				
S0.00   S0.0	Item/Description *		Quantity	Unit	Unit \$	Material			Unit \$	Fauinment		
Sub-sub-sub-sub-sub-sub-sub-sub-sub-sub-s				+	Onit ψ		Omt v		Onit ψ			
S0,000   S		-		1								
SUBCONTRACTOR Direct Cost Summary				1								
S0.00   S0.0						\$0.00		\$0.00		\$0.00		
SOLOD   SOLO												
SO 00   SO 0												
Sub Totals   \$0.00   \$0.00   \$0.00   \$0.00				—								
Sub Totals   \$0.00   \$0.00   \$0.00   \$0.00				+								
Material:   \$0.00					Sub Totals							
Labor   \$0.00					oub rotais	ψ0.00		ψ0.00		ψ0.00		
Labor   S0.00   S0.00	Material:	\$0.00	4									
SUBCONTRACTOR Direct Cost Summary	Labor:											
Item/Description *   Quantity   Unit   Unit   Material   Unit   Labor   Unit   Equipment   Unit   Sub-sub   Sub-su	Equipment:	\$0.00	←									
Item/Description *   Quantity   Unit   Unit   Unit   S   Material   Unit   S   Labor   Unit   Equipment   Unit   S   Unit   Unit   S   Unit   S   Unit   S   Unit   S   Unit   Unit   S   Unit   S   Unit   S   Unit   Unit   S   Unit   S   Unit	Prime Contractor Subtotal:	\$0.00	Ī									
Item/Description *   Quantity   Unit   Unit   Unit   S   Material   Unit   S   Labor   Unit   Equipment   Unit   S   Unit   Unit   S   Unit   S   Unit   S   Unit   S   Unit   Unit   S   Unit   S   Unit   Unit   S   Unit   S   Unit   Unit   S   Unit   Unit   S   Unit   Unit   S   Unit   Unit   Unit   S   Unit												
Quantity   Unit   Unit   Unit   Labor   Unit   Equipment   Unit   Sub-sub   S0.00			SUBCONTRA	ACTOR	R Direct Cos	t Summary	Λm	ount				
\$0.00   \$0.0	Item/Description *		Quantity	Unit	Unit \$	Material			Unit \$	Equipment	Unit \$	Sub-sub
\$0.00   \$0.0	_			+	· · · · · ·		V V		• · · · · · ·		V V	
\$0.00				1		\$0.00						
\$0.00												
\$0.00   \$0.0												
Sub Totals   Sub				-								
Sub Totals   \$0.00				+								
Sub Totals   \$0.00				+								
Material: \$0.00 Labor: \$0.00 Equipment: \$0.00 Sub-sub \$0.00 Sub-sub \$0.00  Subcontractors Subtotal: \$0.00  Prime Cntrtr Subtotal: \$0.00  Prime Cntrtr Subtotal: \$0.00 Total Direct Cost: \$0.00 GC OH&P on Own Work: \$0.00 15% Total OH&P on Sub Work: \$0.00 25%  Total Cost Change				4	Sub Totals							
Labor:   \$0.00					oub rotulo	ψ0.00 		0.00		ψ0.00	l.	<u>Ψ0.0</u>
Sub-sub   \$0.00   Sub-sub   \$0.00	Material	\$0.00	_									
Sub-sub   \$0.00   Subcontractors Subtotal: \$0.00	Material.											
Subcontractors Subtotal: \$0.00												
Mark-up Calculations   Subcontractors Subtotal:   \$0.00     Prime Cntrtr Subtotal:   \$0.00     Total Direct Cost:   \$0.00     GC OH&P on Own Work:   \$0.00   15%     Total OH&P on Sub Work:   \$0.00   25%      Total Cost Change   Add   \$0.00     Deduct   Subcontractors   Subcon	Labor: Equipment:	\$0.00 \$0.00	<b>—</b>									
Subcontractors Subtotal: \$0.00     Prime Cntrt Subtotal: \$0.00     Total Direct Cost: \$0.00     GC OH&P on Own Work: \$0.00   15%     Total OH&P on Sub Work: \$0.00   25%     Total Cost Change	Labor: Equipment: Sub-sub	\$0.00 \$0.00 \$0.00	<b>—</b>									
Subcontractors Subtotal: \$0.00     Prime Cntrt Subtotal: \$0.00     Total Direct Cost: \$0.00     GC OH&P on Own Work: \$0.00   15%     Total OH&P on Sub Work: \$0.00   25%     Total Cost Change	Labor: Equipment: Sub-sub	\$0.00 \$0.00 \$0.00	<b>—</b>									
Prime Cntrtr Subtotal:         \$0.00           Total Direct Cost:         \$0.00           GC OH&P on Own Work:         \$0.00         15%           Total OH&P on Sub Work:         \$0.00         25%    Total Cost Change	Labor: Equipment: Sub-sub	\$0.00 \$0.00 \$0.00										
Total Direct Cost: \$0.00   SC OH&P on Own Work: \$0.00   15%   Total OH&P on Sub Work: \$0.00   25%   Total Cost Change   So.00   Deduct   D	Labor: Equipment: Sub-sub Subcontractors Subtotal:	\$0.00 \$0.00 \$0.00 \$0.00		ark-up	Calculation:	S						
GC OH&P on Own Work: \$0.00 15% Total OH&P on Sub Work: \$0.00 25%  Total Cost Change \$0.00 Deduct	Labor: Equipment: Sub-sub Subcontractors Subtotal:  Subcontractors Subtotal:	\$0.00 \$0.00 \$0.00 \$0.00		ark-up	Calculation	S						
Total OH&P on Sub Work: \$0.00 25%  Total Cost Change \$0.00 Deduct	Labor: Equipment: Sub-sub Subcontractors Subtotal:  Subcontractors Subtotal: Prime Cntrtr Subtotal:	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00		ark-up	Calculations	s						
1 otal Cost Change \$0.00 Deduct	Labor: Equipment: Sub-sub Subcontractors Subtotal:  Subcontractors Subtotal: Prime Cntrtr Subtotal: Total Direct Cost:	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Ma	ark-up	Calculations	S						
1 otal Cost Change \$0.00 Deduct	Labor: Equipment: Sub-sub Subcontractors Subtotal:  Subcontractors Subtotal: Prime Cntrtr Subtotal: Total Direct Cost: GC OH&P on Own Work:	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Ma	ark-up	Calculation	S						
\$0.00 Deduct	Labor: Equipment: Sub-sub Subcontractors Subtotal:  Subcontractors Subtotal: Prime Cntrtr Subtotal: Total Direct Cost: GC OH&P on Own Work:	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Ma	ark-up	Calculation	S						
Total Time Change0 Calendar Days (Critical path impacts only)	Labor: Equipment: Sub-sub  Sub-sub  Subcontractors Subtotal:  Prime Cntrtr Subtotal:  Total Direct Cost: GC OH&P on Own Work: Total OH&P on Sub Work:	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	15% 25%	ark-up	Calculation	S						
	Labor: Equipment: Sub-sub Subcontractors Subtotal:  Subcontractors Subtotal:  Prime Cntrtr Subtotal: Total Direct Cost: GC OH&P on Own Work: Total OH&P on Sub Work:	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	15% 25%	ark-up	Calculation	S						
Materials permanently installed in the building shall be sales tax free.	Labor: Equipment: Sub-sub Subcontractors Subtotal:  Subcontractors Subtotal: Prime Cntrtr Subtotal: Total Direct Cost: GC OH&P on Own Work: Total OH&P on Sub Work:  Total Cost Change  Total Time Change	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	Minute of the state of the stat	vs (Critic								



# Armory Commission of Alabama

REQUEST FOR IN	FORMATION FORM
CONTRACTOR:	PROJECT:
RFI#:	DATE:
TO / ATTN:	FROM:
DESCRIPTION:	
DRAWING NUMBER:	SPEC SECTION:
DESCRIPTION OF RFI:	
RECOMMENDED SOLUTION BY GC:	
SIGNATURE:	
SCHEDULE IMPACT: YES NO UNKNOWN  COST IMPACT: YES NO UNKNOWN	RESPONSE REQUIRED: YES NO
RECOMMENDATION OR RESPONSE:	
SIGNATURE:	DATE:

## **SECTION 01 29 00 - PAYMENT PROCEDURES**

## PART 1 – GENERAL

## 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
  - 1. Section 01 31 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.
  - 3. Section 00 62 76 "Contractor's Periodical Request for Partial Payment"

# 1.03 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.

## 1.04 SCHEDULE OF VALUES

- A. 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 in accordance with the requirements of the requirements of the Addenda and concurrent with both the initial Contractor's Draw Schedule (Section 00 62 83) and Contractor's Progress Schedule (Section 01 32 00).
- B. 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: Utilize the Contractor's Periodical Request for Partial Payment form at Specification 00 62 83 for the Schedule of Values.
  - 2. 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 or as directed by the Owner.
- 3. To the greatest extent possible, round amounts to nearest whole dollar; total shall equal the Contract sum.
- 4. Provide a separate line item in the Schedule of Values 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 per 00 62 78
- 5. 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.
- 6. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by the allowance quantity. Use information indicated in the Contract Documents to determine quantities.
- 7. Alternates: Provide a separate line item in the Schedule of Values for each alternate.
- 8. There shall be a separate line in the amount of 2.5% of the Contract, as awarded, included on the Schedule of Values and titled "Closeout Documents"
- 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.

## 1.05 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as checked by Architect and paid for by Owner.
  - 1. Initial Application for Payment, Application for Payment at time of Completion, and Final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use Owner provided "Contractor's Periodical Request for Partial Payment" and Continuation Sheets as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. NOTE: If the Application is not signed by the person who submitted the Bid, the Architect and/or Owner reserve the right to reject the Application, unless and until the Contractor shall have provided the Owner a letter authorizing additional signatories, on Contractor's letterhead, and that Owner has accepted. 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 and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit three, signed in blue ink and notarized, original copies of each Application for Payment to Architect at the next Owner-Architect-Contractor (OAC) meeting. Include waivers of lien and similar attachments as required.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Initial Application for Payment: Administrative actions and submittals, to include Owner's acceptance, that must precede submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of Values.
  - 3. Contractor's Construction Schedule.
  - 4. Submittals Schedule (preliminary if not final).
  - 5. List of Contractor's principal consultants.
  - 6. Initial settlement survey and damage report if required.
- G. Periodic Applications for Payment: Administrative actions and submittals that must coincide with submittal of each Application for Payment include the following:
  - 1. Contractor's Periodical Request for Partial Payment.
  - 2. Submittals Schedule (updated).
  - 3. Inventory of Stored Materials submitted on form provided in Specification Section 00 62 78.
  - 4. Contractor's Draw Schedule on form provided in Specification Section 00 62 83.
  - 5. Weather Delay Documentation Form as provided in Specification Section 00 63 56.
  - 6. Updated LEED Scorecard (if Applicable)
- H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation showing 100 percent completion for portion of the Work claimed as complete, 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. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  - 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  - 6. AIA Document G707, "Consent of Surety to Final Payment."
  - 7. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Final Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  - 8. Final, liquidated damages settlement statement.

# PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION (NOT USED)

## END OF SECTION

## SECTION 01 31 00 - PROJECT MANGEMENT AND COORDINATION

(Revision Date: 8 April 2021)

#### PART 1 – GENERAL

## 1.01 SUMMARY

- A. Section Includes: Administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination Drawings.
  - 2. Administrative and supervisory personnel.
  - 3. Project meetings.

#### B. Related Sections:

- 1. Section 01 32 00 Construction Progress Documentation: Preparing and submitting Contractor's Construction Schedule.
- 2. Section 01 73 00 Execution: Procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
- 3. Section 01 77 00 Closeout Procedures: Coordinating Contract closeout.
- 4. Section 01 91 13 General Commissioning Requirements: Meetings.

## 1.02 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to assure manufacturers and applicable code(s) [whichever is greater] accessibility for required maintenance, service, and repair.
  - 3. Make provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
  - 1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's Construction Schedule.
  - 2. Preparation of the Schedule of Values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.

- 5. Progress meetings.
- 6. Pre-installation conferences.
- 7. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
  - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

#### 1.03 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
  - 1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
    - a. Indicate functional and spatial relationships of components of architectural, structural, civil/site, mechanical, plumbing, and electrical systems.
    - b. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
  - 2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
  - 3. Number of Copies: Submit two opaque copies of each submittal. Architect will return one copy.
  - 4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- B. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.
  - 1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

## 1.04 PROJECT MEETINGS

- A. General: Architect will schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  - 1. Attendees: Architect will inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Architect will notify Owner and Contractor of scheduled meeting dates and times.
  - 2. Agenda: Architect will prepare and distribute the meeting agenda to all invited attendees.
    - a. Architect shall provide Contractor and Owner with agenda items 48 hours before the Project Meeting.

- 3. Minutes: Architect will record significant discussions and agreements achieved. Meeting minutes will be distributed to everyone concerned, including Owner and Contractor, within three (3) days of the meeting.
- B. Preconstruction Conference: Owner will schedule a preconstruction conference before starting construction, at a time convenient to Architect and Contractor, after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
  - 1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing Change Order Requests and Contract Modifications.
    - f. Procedures for requests for information (RFIs) utilizing the form in Section 01 26 20.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. LEED requirements (if applicable).
    - 1. Preparation of Record Documents.
    - m. Use of the premises and existing building(s).
    - n. Work restrictions.
    - o. Owner's occupancy requirements.
    - p. Responsibility for temporary facilities and controls.
    - q. Construction waste management and recycling.
    - r. Parking availability.
    - s. Office, work, and storage areas.
    - t. Equipment deliveries and priorities.
    - u. First aid.
    - v. Security.
    - w. Progress cleaning.
    - x. Working hours.
  - 3. Minutes: Architect will record and distribute meeting minutes.
- C. Commissioning Meetings: All Commissioning Meetings will be held and conducted in accordance with Section 01 91 13, Part 3.
  - 1. Attendees: The mandatory attendees are the entire commissioning team, Owner, Contractor, affected sub-contractors, Architect and Architect's Consultants for items being commissioned.
  - 2. Agenda: The Commissioning Agent (CxA) will provide all attendees with an agenda.

- 3. Reporting: CxA will take minutes and distribute to the Architect (for further distribution to Architect's Consultant), Owner and Contractor (for further distribution to Contractor's sub-contractor).
- D. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
  - 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
  - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. The Contract Documents.
    - b. Options.
    - c. Related requests for interpretations (RFIs).
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. Protection of construction and personnel.
  - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  - 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
  - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- E. Progress Meetings: Conduct progress meetings at regular intervals (at least monthly) scheduled with the Owner and Architect, otherwise known as Owner-Architect-Contractor (OAC) meetings. Coordinate dates of meetings with preparation of payment requests.
  - 1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or

- involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
- 2. Agenda: Review minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - 1) Review schedule for next period.
  - b. Review present and future needs of each entity present, including the following:
    - 1) Interface requirements.
    - 2) Sequence of operations.
    - 3) Status of submittals.
    - 4) Deliveries.
    - 5) Off-site fabrication.
    - 6) Access.
    - 7) Site utilization.
    - 8) Temporary facilities and controls.
    - 9) Work hours.
    - 10) Hazards and risks.
    - 11) Progress cleaning.
    - 12) Quality and work standards.
    - 13) Status of correction of deficient items.
    - 14) Field observations.
    - 15) Requests for information (RFIs).
    - 16) Status of proposal requests.
    - 17) Pending Change Order Requests.
    - 18) Status of Contract Modifications.
    - 19) Pending claims and disputes.
    - 20) Review of executed Periodical Requests for Partial Payments.
- 3. Minutes: Contractor will record the meeting minutes.
- 4. Reporting: Not later than 3 days after each meeting, distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
  - a. Schedule Updating: Update Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

# PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION (NOT USED)

## SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

## PART 1 – GENERAL

## 1.01 SUMMARY

- A. 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. Field condition reports.

#### B. Related Sections:

- 1. Section 012900 Payment Procedures: Submitting the Schedule of Values.
- 2. Section 013100 Project Management and Coordination: Submitting and distributing meeting and conference minutes.
- 3. Section 013300 Submittal Procedures: Submitting schedules and reports.
- 4. Section 014000 Quality Assurance: Submitting a schedule of tests and inspections.

#### 1.02 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- B. Fragment: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- C. Major Area: A story of construction, a separate building, or a similar significant construction element.

#### 1.03 SUBMITTALS

- A. Submittals Schedule: Submit three (3) 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. Field Condition Reports: Submit two (2) copies at time of discovery of differing conditions.

## 1.04 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 (01 29 00) and Contractors Draw Schedule (00 62 83), 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

#### 2.01 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, 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. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

## 2.02 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the NTP to date of Final 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.
- B. 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 20 days, unless specifically allowed by Owner.
  - 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 resubmittal times indicated in Section 01 33 00 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 three (3) days for startup and testing.
  - 5. Project Completion: Indicate completion in advance of date established for Project Completion, and allow time for Architect's administrative procedures necessary for certification of Project Completion.

- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
  - 1. Phasing: Arrange list of activities on schedule by phase.
  - 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  - 3. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Partial occupancy before Final Acceptance.
    - e. Use of premises restrictions.
    - f. Provisions for future construction.
    - g. Seasonal variations.
    - h. Environmental control.
  - 4. Work Stages: Indicate important stages of construction for each major portion of the Work.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Punch List Inspection, and Final Inspection.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.

# 2.03 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format. Submit two (2) opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
- B. CPM Schedule: Submit Contractor's Construction Schedule, simultaneously with the Schedule of Values (01 29 00) and the Draw Schedule (00 62 83), using a computerized, time-scaled CPM network analysis diagram for the Work in accordance with General Conditions, Article 9.
  - 1. 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 Owner's approval of the schedule.
  - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  - 3. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- C. 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, time-scaled 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. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- D. 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.
- E. 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.

#### 2.04 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. Equipment at Project site.
  - 3. Material deliveries.
  - 4. High and low temperatures and general weather conditions.

- 5. Accidents.
- 6. Stoppages, delays, shortages, and losses.
- 7. Meter readings and similar recordings.
- 8. Orders and requests of authorities having jurisdiction.
- 9. Services connected and disconnected.
- 10. Equipment or system tests and startups.
- B. 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. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

#### PART 3 – EXECUTION

#### 3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
  - 1. Revise schedule 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.
  - 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.
- B. 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**

<b>SECTION 01</b>	32 01 -	- PROJECT	SCHEDULE

(Revised 3 August 2021)

## PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 PROJECT SCHEDULER QUALIFICATIONS

#### PART 2 PRODUCTS

- 2.1 SOFTWARE
  - 2.1.1 Owner's Default Software
  - 2.1.2 Contractor Software

#### PART 3 EXECUTION

- 3.1 GENERAL REQUIREMENTS
- 3.2 PROJECT SCHEDULE DETAILED REQUIREMENTS
  - 3.2.1 Level of Detail Required
  - 3.2.2 Activity Durations
  - 3.2.3 Procurement Activities
  - 3.2.4 Mandatory Tasks
  - 3.2.5 Owner Activities
  - 3.2.6 Standard Activity Coding Dictionary
    - 3.2.6.1 Area of Work Coding (AREA)
    - 3.2.6.2 Modification Number (MODF)
    - 3.2.6.3 Bid Item Coding (BIDI)
    - 3.2.6.4 Phase of Work Coding (PHAS)
  - 3.2.7 Contract Milestones and Constraints
    - 3.2.7.1 Project Start Date Milestone and Constraint
    - 3.2.7.2 End Project Finish Milestone and Constraint
    - 3.2.7.3 Interim Completion Dates and Constraints
    - 3.2.7.3.1 Start Phase
      - 3.2.7.3.2 End Phase
  - 3.2.8 Calendars
  - 3.2.9 Open Ended Logic
  - 3.2.10 Default Progress Data Disallowed
  - 3.2.11 Out-of-Sequence Progress
  - 3.2.12 Added and Deleted Activities
  - 3.2.13 Original Durations
  - 3.2.14 Leads, Lags, and Start to Finish Relationships
  - 3.2.15 Retained Logic
  - 3.2.16 Percent Complete
  - 3.2.17 Remaining Duration
  - 3.2.18 Cost Loading of Closeout Activities
    - 3.2.18.1 As-Built Drawings
  - 3.2.19 Early Completion Schedule and the Right to Finish Early
- 3.3 PROJECT SCHEDULE SUBMISSIONS
  - 3.3.1 Preliminary Project Schedule Submission
  - 3.3.2 Initial Project Schedule Submission

3.3.3	Periodic Schedule Updates
3.4	SUBMISSION REQUIREMENTS
3.4.1	Data CD/DVDs
3.4.2	Hard Copies
3.4.3	CPM/GANTT Chart
3.4	.3.1 Continuous Flow
3.4	.3.2 Project Milestone Dates
3.4	3.3 Critical Path
3.4	3.4 Banding
3.5 l	PERIODIC SCHEDULE UPDATE
3.5.1	Periodic Schedule Review Meetings/OAC
3.6 l	REQUESTS FOR TIME EXTENSIONS
3.6.1	Justification of Delay
3.6.2	Time Impact Analysis (Prospective Analysis)
3.6.3	Time Extension
3.7 l	FAILURE TO ACHIEVE PROGRESS
3.7.1	Artificially Improving Progress
3.7.2	Failure to Perform
3.7.3	Recovery Schedule
3.8	OWNERSHIP OF FLOAT

<sup>--</sup> End of Section Table of Contents --

## **SECTION 01 32 01 - PROJECT SCHEDULE**

## PART 1 GENERAL

#### 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

# U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11

(1995) Administration -- Progress, Schedules, and Network Analysis Systems

## 1.2 SUBMITTALS

Owner approval is required for submittals with an "Owner" Classification. Submittals not having an "Owner" classification are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

**SD-01 Preconstruction Submittals** 

Preliminary Project Schedule; Owner Initial Project Schedule; Owner Periodic Schedule Update;

# 1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of two years' experience scheduling construction projects similar in size and nature tothis project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

#### PART 2 PRODUCTS

# 2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.

#### 2.1.1 Owner's Default Software

The Owner does not currently use a scheduling software.

#### 2.1.2 Contractor Software

Scheduling software used by the contractor must be commercially available.

## PART 3 EXECUTION

# 3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

# 3.2 PROJECT SCHEDULE DETAILED REQUIREMENTS

# 3.2.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to addressmajor milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

# 3.2.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities may have Original Durations (OD) greater than 20 work days or 30 calendar days.

#### 3.2.3 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

# 3.2.4 Mandatory Tasks

Include the following activities/tasks in the initial project schedule and all updates.

- a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).
- b. Long procurement activities

- c. Submission and approval of testing and air balance (TAB).
- d. Submission of TAB specialist design review report.
- e. Building commissioning Functional Performance Testing.
- f. Controls testing plan submission.
- g. Controls testing.
- h. Performance Verification testing.
- i. Other systems testing, if required.
- j. Contractor's punch list inspection.
- k. Correction of punch list from Contractor's punch list inspection.
- 1. Owner's punch list inspection.
- m. Correction of punch list from Owner's punch list inspection.
- n. Final inspection.

## 3.2.5 Owner Activities

Show Owner and other agency activities that could impact progress. These activities include, but are not limited to: approvals, acceptance, environmental permit approvals by Alabama Department of Environmental Management (ADEM), inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

# 3.2.6 Standard Activity Coding Dictionary

Use an activity coding structure. Develop and assign all Activity Codes to activities as detailed herein.

# 3.2.6.1 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or spaceconstraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities cannot have more than one Work Area Code.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

## 3.2.6.2 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer.

Key all Code values to the Owner's modification numbering system. An activity can have only one Modification Number Code.

## 3.2.6.3 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity isnot cost loaded. An activity can have only one BIDI Code.

# 3.2.6.4 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are procurement phase and construction phase. Each activity can have only one Phase of Work code.

- a. Code proposed fast track construction phases proposed to allow filtering and organizing the schedule by fast track construction packages.
- b. If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

## 3.2.7 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited. Mandatory constraints that ignore or effect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

## 3.2.7.1 Project Start Date Milestone and Constraint

The first activity in the project schedule must be a start milestone titled "NTP Issued," which must have a "Start On" constraint date equal to the date that the NTP is issued.

## 3.2.7.2 End Project Finish Milestone and Constraint

The last activity in the schedule must be a finish milestone titled "EndProject."

Constrain the project schedule to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Owner is under no obligation to accelerate Owner activities to support a

Contractor's early completion.

# 3.2.7.3 Interim Completion Dates and Constraints

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

#### 3.2.7.3.1 Start Phase

Use a start milestone as the first activity for a project phase. Call the start milestone "Start Phase X" where "X" refers to the phase of work.

#### 3.2.7.3.2 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

#### 3.2.8 Calendars

Schedule activities on a Calendar to which the activity logically belongs. Develop calendars to accommodate any contract defined work period such as a 7-day calendar for Owner Acceptance activities, concrete cure times, etc. Develop the default Calendar to match the

physical work plan with non-work periods identified including weekends and holidays. Develop Seasonal Calendar(s) and assign to seasonally affected activities as applicable.

# 3.2.9 Open Ended Logic

Only two open ended activities are allowed: the first activity "NTP Issued" may have no predecessor logic, and the last activity "End Project" may have no successor logic.

Predecessor open-ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.

# 3.2.10 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other.

## 3.2.11 Out-of-Sequence Progress

Address out of sequence progress or logic changes in the periodic schedule update meetings.

## 3.2.12 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

# 3.2.13 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approval is granted by the Owner.

# 3.2.14 Leads, Lags, and Start to Finish Relationships

Lags must be reasonable as determined by the Owner and not used in place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic.

- 3.2.14.1 Leads (negative lags) are prohibited.
- 3.2.14.2 Start to Finish (SF) relationships are prohibited.

# 3.2.15 Retained Logic

Schedule calculations must retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity(s) starts and the predecessor activity(s) has not finished (out-of-sequenceprogress). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") are not be allowed.

# 3.2.16 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management. Percent complete must be updated no later than each OAC/Periodic Schedule Update meeting.

# 3.2.17 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

# 3.2.18 Cost Loading of Closeout Activities

Cost load the "Correction of punch list from Owner's punch list inspection" activity(ies) not less than 1 percent of the present contractvalue. Activity(ies) may be declared 100 percent complete upon the Owner's verification of completion and correction of all punch list work identified during Owner's punch list inspection(s) – i.e. upon issuance of a fully

executed Certificate of Final Completion.

# 3.2.18.1 As-Built Drawings / O&M Manuals

Activity will be declared 100 percent complete upon the Owner's approval and acceptance of the as-built drawings which will happen no earlier than Owner's Final Inspection.

## 3.2.19 Early Completion Schedule and the Right to Finish Early

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed beforethe contractually required completion date.

3.2.19.1 The Owner is under no obligation to accelerate work items the Owner is responsible for to ensure that the early completion is met nor is the Owner responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

#### 3.3 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data and CPM/GANTT Charts (submitted in Adobe via CD/DVD and in hard copy) required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor may be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Owner on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

#### 3.3.1 Preliminary Project Schedule Submission

Within 14 calendar days after the Notice to Proceed (NTP) is issued submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as, permitting activities and other non-construction activities intended to occur within the first 90 calendar days. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI).

## 3.3.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 28 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period.

## 3.3.3 Periodic Schedule Updates

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a Periodic Schedule Update for review at the schedule updatemeetings as prescribed in the paragraph PERIODIC SCHEDULE REVIEW MEETINGS. These updates will enable the Owner to assess Contractor'sprogress.

3.3.3.1 Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete.

## 3.4 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Review meeting throughout the life of the project:

#### 3.4.1 Data CD/DVDs

For the Preliminary and Initial Schedules, provide two sets of data CD/DVDs containing the current project schedule in Adobe format. Label each CD/DVD indicating the type of schedule (Preliminary or Initial), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

# 3.4.2 Hard Copies

Provide two hard copies for each of the Preliminary, Initial and Periodic Schedule Review meetings in CPM/GANTT chart form.

# 3.4.3 CPM/GANTT Chart

The CPM/GANTT Chart is required for the Preliminary, Initial and Periodic Schedule Review meetings. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

#### 3.4.3.1 Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, and duration.

# 3.4.3.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

#### 3.4.3.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

## 3.4.3.4 Banding

Organize activities using the WBS or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by major elements of work, category of work, work area and/or responsibility.

# 3.5 PERIODIC SCHEDULE UPDATE

## 3.5.1 Periodic Schedule Review Meetings/OAC

Conduct periodic schedule review meetings, concurrently with all OAC meetings, for the purpose of reviewing the proposed Periodic Schedule Update and progress payment. Conduct meetings at least monthly within five days of the proposed schedule data date. The Contractor's authorized scheduler must organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or Owner. The meeting is a working interactive exchange which allows the Owner and Contractor the opportunity to review the updated schedule on a real time and interactive basis. The Contractor's Project Manager and scheduler must attend the meeting with the authorized representative of the Contracting Officer. The Superintendent, foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work.

# 3.6 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Owner request for proposal (RFP) to justify time extensions.

# 3.6.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple impacts consider any concurrency of delay.

# 3.6.2 Time Impact Analysis (Prospective Analysis)

Prepare a time impact analysis for approval by the Contracting Officer based on the industry standard. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time framebetween the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes may be incorporated into the schedule being used to justify the time impact.

#### 3.6.3 Time Extension

The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

#### 3.7 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

# 3.7.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report.

# 3.7.2 Failure to Perform

Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in the full range of options available to the Contracting Officer; including, but not limited to, the Contractor being declared "non-responsible" and barred from bidding on future projects for a period of time, Liquidated Damages being imposed on the Contractor or early termination of the project.

## 3.8 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, may not be considered for the exclusive use of either the Owner or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

#### **End of Section**

## **SECTION 01 33 00 - SUBMITTAL PROCEDURES**

## **PART 1 - GENERAL:**

## 1.01 SUMMARY

A. Shop Drawings and samples shall be properly identified by project name, description or names of equipment, materials, and items, and complete identification of locations at which materials or equipment are to be installed.

## 1.02 SHOP DRAWINGS

- A. Submit Shop Drawings for all items called for in the detail Specifications. Submit a minimum of six (6) black line prints of each Drawing, unless otherwise specified in the detail Specifications. Two prints of each Drawing will be retained by the Architect, the remaining prints will be returned to the Contractor. One print of each Drawing, bearing the final approval stamp of Architect, shall be kept at the project office and shall be maintained in good condition. No Shop Drawings other than those stamped "Approved" shall be on the job for any purpose and any work installed incorrectly from any Shop Drawing shall be removed and corrected at no change in contract price.
- B. Approval will be for general design only and will not relieve Contractor from responsibility for errors or omissions in Shop Drawings, even though same were not indicated when approved.
- C. In checking Shop Drawings, The Architect shall not be required to check dimensions, quantities, electrical characteristics, specific capacities, or coordination with other trades, these being the responsibility of the Contractor. Contractor shall attest, either in writing, by stamp, or signature, that all Shop Drawings submitted for approval have been checked for compliance with the Drawings and Specifications prior to submissions to the Architect otherwise they will be returned unchecked.
- D. No Shop Drawings shall be submitted directly to the Architect from a manufacturer, jobber, or sub-contractor. All submittals shall be through the General Contractor.
- E. Approvals shall not be construed as approved departure from Contract Drawings and Specifications.

## 1.03 SAMPLES

- A. Furnish all samples called for in the detail Specifications and such other samples as the Architect may direct.
- B. Samples or color selections shall include a complete selection of available colors and finishes. After Owner has selected colors and finishes, submit four additional samples of the selected colors and finishes which will become a master color guide to be used throughout the progress of the work.

## 1.04 SUBMISSION

- A. Submission of Shop Drawings and samples shall be by a transmittal letter, in duplicate, containing project name, Contractor's name, Sub-contractor's and/or Vendor's name, a complete listing of Drawings or Samples submitted, and other pertinent data.
- B. Samples of materials in connection with mechanical and electrical work may not be submitted to the Engineer. All samples of materials are to be submitted to the Architect.
- C. Samples for the selection of colors and finishes shall be made in one submittal. No color selections will be made until samples on all items requiring color selection have been submitted.

## END OF SECTION

# **SECTION 01 40 00 - QUALITY REQUIREMENTS**

## PART 1 – GENERAL

## 1.01 SUMMARY

## A. Section Includes:

- 1. Quality Control Requirements.
- 2. Administrative and procedural requirements for quality assurance and quality control.

#### B. Related Sections:

- 1. Section 01 32 00 Construction Progress Documentation: Developing a schedule of required tests and inspections.
- 2. Section 01 73 29 Cutting and Patching: Repair and restoration of construction disturbed by testing and inspecting activities.
- 3. Divisions 02 through 50 Sections: Specific test and inspection requirements.

# 1.02 QUALITY CONTROL REQUIREMENTS

- A. General: The Contractor shall establish a system of inspections and tests of his work and that of his subcontractors to insure that all applicable requirements of the specifications are met.
  - 1. The Contractor shall be diligent to insure that the quality of workmanship is satisfactory, that dimensional requirements are met, that defective materials are not used and that all required control and laboratory testing procedures are effected.
  - 2. Where specific testing procedures are not stipulated, the Contractor shall establish and conduct a test procedure to insure adherence to specified quality.
  - 3. The Contractor shall make an initial inspection of each phase of work as soon as a representative portion has been completed, and the Contractor shall make daily follow-up inspections, to insure that an acceptable quality of work is established and maintained.
  - 4. The Contractor shall perform a pre-final inspection and work off all punch list items prior to Architect's or Owner's inspection(s).

## 1.03 DEFINITIONS

- A. Conventional Inspections: Inspections, not specifically required by Code, which are considered essential to the proper performance of the building systems.
- B. Inspections: Evaluation of systems, primarily requiring observation and engineering judgment.
- C. Quality-Control Services: Conventional inspections, special inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. Services do not include contract enforcement activities performed by Architect.

- D. Special Inspections: Inspections, required by Code, which monitor the quality of materials and workmanship critical to the structural integrity of the building.
- E. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- F. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- G. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
- H. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- I. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction and the Owner, to establish product performance and compliance with industry standards.
- J. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- K. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- L. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- M. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- M. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

## 1.04 QUALITY ASSURANCE AND CONTROL SERVICES REQUIREMENTS

- A. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
- B. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, the Contract Documents or authorities having jurisdiction are not limited by provisions of this Section.

# 1.05 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement, unless directed otherwise by the Owner. Refer uncertainties and requirements that are different, but apparently equal, to the Architect, in writing, for the Owner's decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect, in writing, for the Owner's decision before proceeding.

## 1.06 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Reports: Prepare and submit certified written reports that include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.
  - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

- 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
- 12. Name and signature of laboratory inspector.
- 13. Recommendations on retesting and re-inspecting.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

## 1.07 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: 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.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

- 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
- 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
- 3. Demonstrate the proposed range of aesthetic effects and workmanship.
- 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
- 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- 6. Demolish and remove mockups when directed, unless otherwise indicated.

# 1.08 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  - 2. Payment for these services will be made from allowances, as authorized by the Owner.
  - 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Modification.
- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction, at no additional expense to the Owner or Architect. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 1. Where services are not indicated as Owner's responsibility, engage a qualified testing agency to perform these quality-control services.
  - 2. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  - 3. Notify testing agencies and Architect at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  - 4. For all quality-control services that are not indicated as Owner's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  - 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 Submittal Procedures.
- D. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
  - 1. Notify Architect, Owner, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  - 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  - 1. Access to the Work.
  - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
  - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  - 4. Facilities for storage and field curing of test samples.
  - 5. Delivery of samples to testing agencies.
  - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

## 1.09 STANDARD AND INDUSTRY SPECIFICATIONS

- A. Any material or operation specified by reference to the published specification of a manufacturer, The American Society for Testing and Materials (ASTM), The American Standards Association (ASA), Federal Specifications, or other published standard shall comply with the requirements of the current specification or standard listed. Should there be a discrepancy between the referenced specification and the contract documents the latter shall govern unless written interpretation is obtained from the Owner. Should there be discrepancies among referenced specifications or standards, the more stringent requirements shall govern.
- B. The Contractor shall, if requested, furnish an affidavit from the manufacturer(s) certifying that the materials or products being furnished meet the requirements specified. Such certification, however, shall not relieve the Contractor from the responsibility of complying with other requirements of the contract documents.

#### 1.10 MANUFACTURER'S DIRECTIONS

A. All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturers unless herein specified to the contrary. Should there be a discrepancy between an installation as required by the drawings and/or specifications and the manufacturer's directions and/or recommendations, such discrepancy shall be brought to the attention of the Architect and shall be resolved before the work may proceed.

## 1.11 APPROVED MATERIAL REQUIREMENTS

A. In the event the architectural, plumbing, mechanical and/or electrical requirements of any "APPROVED" material is different from that specified and/or as indicated on the drawings, any additional cost involved shall be the responsibility of the Contractor. No extra cost to the Owner or Architect will be allowed because of the use of such materials.

## 1.12 USE OF FOREIGN MATERIALS

A. The Contractor shall agree to use in the execution of this contract only materials, supplies, and products manufactured, mined, processed or otherwise produced in accordance with the Buy American Act (41 USC 10a-10d).

## 1.13 EXAMINATION OF SURFACES AND/OR CONDITIONS

A. The Contractor shall examine all surfaces on which, or against which, their work is to be applied and shall notify the Architect in writing of any defects the Contractor may discover which, in the Contractor's opinion, would be detrimental to the proper installation or operation of the Contractor's products. Commencing of work by the Contractor denotes acceptance by Contractor of all surfaces and conditions affecting Contractor's work.

#### PART 2 - PRODUCTS (NOT USED)

#### PART 3 – EXECUTION

### 3.01 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Comply with the Contract Document requirements for Section 01 73 29 Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

#### SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 – GENERAL

## 1.01 TEMPORARY OFFICES AND SHEDS

- A. At the Contractor's Option, he may provide an office, storage sheds, and other structures as may be necessary to carry on the work.
- B. Storage sheds shall be of sufficient size to hold materials required on the job site at one time, and shall have floors raised at least 1'0" above the ground on heavy joists or sleepers. Sheds shall be watertight.

## 1.02 TELEPHONE (CONTRACTORS OPTION)

A. The Contractor may install, at his own expense, a single party job telephone, which shall be available for the use of all persons concerned with the construction of the project. All official long distance calls shall be paid by the General Contractor.

### 1.03 TOILET FACILITIES

- A. The Contractor shall, at the beginning of the work, provide on the premises toilet facilities and enclosures for the use of all workmen on the project; shall maintain same in a sanitary condition; and shall remove same at the completion of the building and/ or when directed by the Architect or Owner.
- B. The toilets shall, in construction details, equipment connections, and maintenance conform to all rules, regulations, and requirements of the City or County Health Department having jurisdiction.

### 1.04 RODENT AND VERMIN CONTROL

A. The Contractor shall provide on the job site ample and suitable containers with covers, and shall be fully responsible for containing and removing from the site all refuse from meals eaten on the site and other rodent or vermin attracting refuse. If the Contractor has the entire site the Contractor is solely responsible for ensuring that the site is rodent and vermin free at the Final Inspection.

#### **1.05 SIGNS**

A. No signs will be allowed on the premises except as required by the project specifications and/or as approved by the Owner.

### 1.06 PROTECTION

A. Provide and maintain all fences, planking, bridges, bracing, shoring, sheet piling, lights, barricades, warning signs, and guards as necessary for the protection of streets, sidewalks, landscaping, adjoining property, and the streets adjacent.

B. Provide protection for all shrubs, trees, lawns, walks, roads, drives, adjacent buildings and equipment, both on and off property, and in roads and streets adjacent.

### 1.07 REMOVAL

A. Temporary facilities shall be removed promptly as each becomes no longer required, but in all cases no later than the date of Final Acceptance.

### 1.08 STORAGE AND PARKING AREA

A. The amount of area and location that may be used for parking, storage of materials, equipment, sheds, and offices shall be as indicated by the Drawings or as directed by the Owner.

### 1.09 FIRST AID PROTECTION

- A. General Contractor shall provide the following:
  - 1. First Aid Accident Cabinets.
  - 2. Emergency telephone numbers posted at telephone.

### 1.10 FIRE PRECAUTION DURING CONSTRUCTION

A. Emergency fire protection shall be provided for temporary sheds, new work, stacked materials, etc., using extinguishers, water pails and small hose streams, said equipment conforming to the requirements of the National Board of Fire Underwriters and relevant Insurance Co. Particular care shall be exercised when using open flame and welding and cutting equipment; use only flameproof type tarpaulins. Keep site clean and orderly with proper protection of combustibles while in use and in storage.

## **SECTION 01 60 00 - PRODUCT REQUIREMENTS**

#### PART 1 – GENERAL

### 1.01 PRODUCTS AND MATERIALS

A. Products, Materials, and manufactured items or articles of like nature, shall as nearly as possible, be of one brand or manufacturer. No changes or substitutions shall be made without written consent of the Owner.

#### 1.02 TRADE NAMES

A. The use of manufacturer's names and model numbers are given to establish a standard of manufacture and not intended to be restrictive or preferential. Similar, equal, and approved materials of other manufacturers will be acceptable, subject to the approval of the Owner, pursuant to requirements set forth in Instruction to Bidders and as required by the Specifications.

#### 1.03 MEASUREMENTS

A. Before ordering any material or doing any work, the Contractor shall verify all measurements of the building and shall be responsible for correctness of same. No extra charge or compensation will be allowed because of differences between actual measurements and the dimensions indicated on the Drawings. Any Differences which may be found, shall be submitted to the Architect for consideration before proceeding with the work.

### 1.04 SALVAGEABLE MATERIAL

A. Any salvageable material and or equipment shall remain the property of the Owner and upon removal from its existing location shall be stored where directed by the Owner. In the event that the Owner does not wish to keep the salvaged material, it shall be the responsibility of the Contractor to remove same promptly form the site.

# **PART 2 – PRODUCTS**

## 2.01 PRODUCT OPTIONS

- A. 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.
- B. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
- C. 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.

- D. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- E. Where products are accompanied by the term "as selected," Architect will make selection.
- F. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
- G. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
- H. 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 "Comparable Products" Article to obtain approval for use of an unnamed product.
- I. Product and Manufacturer Source: Where specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product names, unless otherwise indicated.

## 2.02 PRODUCT SUBSTITUTIONS

- A. Proposed Substitutions During Bidding: In the technical sections of the specifications under Products heading, where only one manufacturer's specific data including material, model, specification, finish, color, or other specific identification is noted, it is to indicate standards required and that manufacturer's data is automatically approved. If another manufacturers propose to bid on the work, including any other manufacturer listed in the specification section as a manufacturer, the Bidder shall submit full data to the Architect no later than 10 days prior to bid date and shall gain specific approval, via Addendum, on specific products prior to bidding. In the event submitted data of any manufacturer gains approval through this method, the manufacturer and the specific products will be published in an addendum prior to bid date. Only manufacturer's products listed in the original specifications or listed as approved in a subsequent addendum shall be used on the project. No other manufacturers or their products will be considered without prior written consent from the Owner.
- B. Proposed Substitutions After Commencement of The Work: Requests received during construction may be considered only when all of the following specific conditions are satisfied. IF the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  - 1. Submission, and approval of, Substitution Request Form During Construction 01 25 14.
  - 2. None of the approved products of the specified type are available.
  - 3. Requested substitution has been coordinated with other portions of the Work.
  - 4. Requested substitution provides specified warranty.

5. 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.

### SECTION 01 73 00 - EXECUTION

### PART 1 – GENERAL

### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. General installation of products.
  - 3. Progress cleaning.
  - 4. Starting and adjusting.
  - 5. Protection of installed construction.
  - 6. Correction of the Work.
- B. Related Sections include the following:
  - 1. 01 31 00 "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
  - 2. 01 33 00 "Submittal Procedures" for submitting surveys.
  - 3. 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

### PART 2 - PRODUCTS (NOT USED)

### **PART 3 – EXECUTION**

### 3.01 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 site work, 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.

## 3.02 PREPARATION

- A. Existing Utility Information: Furnish information to local utility 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.

### 3.03 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 (2.4 m) in spaces without a suspended ceiling.

- 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. Maintain conditions required for product performance until Final Acceptance.
- D. 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.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. 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.
- G. 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.
- H. 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.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

## 3.04 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 (27 deg C).
  - 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 Final Acceptance.
- 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 Final Acceptance.
- 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.

### 3.05 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 01 Section "Quality Requirements."

### 3.06 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Final Acceptance.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.07 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."
  - 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.

#### END OF SECTION

### **SECTION 01 73 29 - CUTTING AND PATCHING**

### PART 1 – GENERAL

## 1.01 CUTTING AND PATCHING PROPOSAL:

- A. Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include a description of cutting and patching and changes to existing construction, a list of products to be used and firms or entities that will perform the Work, dates when cutting and patching will be performed, and a list of utilities that cutting and patching procedures will disturb or affect.
- B. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
  - 1. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.
- C. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- D. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
  - 1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
- F. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

# **PART 2 – PRODUCTS**

#### **2.01 GENERAL:**

- A. Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

### **PART 3 – EXECUTION**

#### 3.01 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
- B. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 1. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- F. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to occupied areas or the remainder of the building(s).
- G. Performance: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- H. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.

- 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
- 6. Proceed with patching after construction operations requiring cutting are complete.
- I. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  - 4. Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
  - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

### SECTION 01 77 00 - PROJECT CLOSEOUT

(Revision Date: 9 April 2021)

#### **PART 1 - GENERAL:**

### 1.01 SUMMARY

A. The work under this Section consists of, but is not limited to; Submittals, Requirements and Procedures for Project close out.

### 1.02 RELATED SECTIONS

- A. Section 01 33 00 Submittal Procedures
- B. Section 01 78 13 Project Closeout Checklist
- C. Section 00 65 20 Final Completion Form

### 1.03 SUBMITTALS

- A. Construction Completion Requests
  - 1. Certificate of Final completion
  - 2. Final Inspection
- B. Close out Submittals: Three printed (hard) copies and three electronic copies in Adobe PDF format on CD or DVD-5 of close out submittals of which receipt and acceptance are prerequisites for final payment shall include, but not necessarily be limited to, the following:
  - 1. Affidavit of "Advertisement of Completion". Refer to Section 00 65 13.
  - 2. Evidence of Payments, and Release of Liens.
  - 3. General Contractors "One Year Guarantee".
  - 4. General Contractors "State of Alabama Roofing Guarantee". Refer to Section 00 65 36 (If Applicable).
  - 5. Final Application for Payment.
  - 6. All required warranties and guarantees.

## 1.04 PUNCH LIST

A. Any salvageable material and or equipment shall remain the property of the Owner and upon removal from its existing location shall be stored where directed by the Architect. In the event that the Owner does not wish to keep the salvaged material, it shall be the responsibility of the Contractor to remove same promptly from the site.

# B. Inspection:

- 1. Prior to completion of the project, the Contractor shall fully prepare their own written Punch List. Upon completing correction of all Contractor generated Punch List items, the Contractor shall forward to the Owner and Architect a copy of their Punch List along with written notification that they have completed their entire list of items and are requesting a formal Punch List inspection.
- 2. When the Owner confirms the Inspection date and time, the Architect will notify all parties in writing via e-mail the confirmed date and time for the Inspection. 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 Owner and Architect's availability. Cancellations received less than 48 hours in advance shall incur a minimum \$1,500.00 re-inspection fee.
- 3. The Contractor is responsible for ensuring they and all their Sub-Contractors are completely ready for all Commissioning Activities and Inspections. If the Contractor and /or any of their associated Sub-contractors are not ready, then the Owner reserves the option to deduct from the Contractor all costs for the A/E team and Owner team participation due to failure of the Contractor and/or their Sub-contractors to be ready for Commissioning Activities or Inspections.
- C. Rejection of Certification by Contractor:
  - Should the Architect consider that work is not complete he will, on completion of
    inspection, immediately notify Contractor, in writing, stating reasons. Contractor
    shall complete work and send second written notice to the Architect certifying that
    project, or designated portion of project, is complete, after which the Architect and
    Owner representative will inspect work.

### 1.05 FINAL INSPECTION

- A. Certification: Contractor shall submit written certification that: Contract Documents have been reviewed; project has been inspected for compliance with Contract Documents; Work has been completed in accordance with Contract Documents; Equipment and Systems have been tested in presence of Owner's Representative and are operational and Project is completed and ready for final inspection.
- B. Inspection: Architect and Owner will make final inspection of the project within a reasonable time after receipt of certification. Should Owner consider that work is in fact complete in accord with requirements of Contract Documents, he will request Contractor to make Project Closeout Submittals. Should Owner consider that work is not complete, he will notify Contractor, in writing, stating reasons. Contractor shall take immediate steps to remedy stated deficiencies, and send second written notice to Architect certifying that work is complete. The Architect and Owner will re-inspect the work.
- C. Certificate of Final Completion: Should the Owner consider that work is complete:
  - 1. Architect will prepare and issue a Certificate of Final Completion, or approved equal, complete with signatures of Owner and Contractor.
  - 2. For Owner occupancy of Project or designated portion of project, Contractor shall: perform final cleaning; and Contractor shall complete work listed for completion or correction, within designated time.

#### 1.06 AS-BUILT DRAWINGS

A. Upon completion of this contract, the Contractor shall deliver to the Owner, at the Final Inspection, the three complete sets of legible drawings which vary from the original contract documents, showing all construction equipment, mechanical and electrical systems and connections as installed or built. All lettering and drawings shall be neat and recorded in permanent ink. The record drawings shall be supplemented by detailed sketches or drawings when necessary. "As-Built" Drawings not legible shall be completely redone.

- B. The Owner shall approve Record Drawings, and shall be the sole judge of the acceptability of the Drawings.
- C. Submit three electronic copies of all as built documents in Adobe PDF format on CD or DVD-5, simultaneous with the Closeout Documents.

### 1.07 OPERATION AND MAINTENANCE DATA

- A. If applicable furnish three (3) complete sets of manuals containing manufacturer's instructions for operation and maintenance of each item of equipment and apparatus furnished under the Contract, detailed parts list and any additional data specifically required under various sections of the Specifications. Manuals shall be arranged in proper order, indexed and suitably bound in a 3-ring loose-leaf binder for 8 1/2" X 11" paper with black vinyl covers. Label binder with embossed plastic tape designating the name of Project, Owner, Contractor, and equipment of materials included in the manual. Certify by endorsement therein that each of the manuals is complete and accurate. Deliver manuals to the Owner at the Final Inspection of the project.
- B. Submit three electronic copies of all manuals and documents in Adobe PDF format on CD or DVD-5, simultaneous with the Closeout Documents.
- C. Special Requirements Mechanical (if applicable): Operating instructions for the principal plant mechanical components, for use by operating personnel, shall be provided. They shall be laminated between thermoplastic sheets and affixed where directed by the Architect or Owner. Instructions shall describe the function of the equipment, its most economical operation, start-up and shut-down procedures, procedures to follow in event of failure, normal maintenance practices, and caution and warning notices.
- D. Special Requirements Electrical (if applicable): Frame under glass, or clear plastic, one print of the "As-Built" power riser diagram at main switch or switchboard location or at a location directed by the Architect or Owner. Provide circuit identification for each circuit in each panel board cabinet.

## 1.08 GUARANTEES AND BONDS

A. Contractor shall submit to the Architect, simultaneous with the Closeout Documents, all warranties, guarantees, and Surety Bonds. All such documents shall show the name and location of the Project and the name of the Owner.

#### 1.09 INSTRUCTIONS

A. Instruct Owner's personnel in required roof maintenance and operation of all systems, mechanical, electrical and other equipment, prior to requesting the Punch List Inspection.

#### 1.10 ADVERTISEMENT OF COMPLETION

A. Immediately after completion of the Contract, but not before receipt of a fully executed Final Completion Form, the General Contractor shall give notice of completion by an

advertisement in the newspaper of general circulation published within the City or County wherein the work was done, once a week for four consecutive weeks.

- B. In no case will a final settlement be made upon the Contract until the expiration of thirty (30) days from commencement of advertisement or before receipt of advertisement with affidavit as required by law.
- C. Proof of publication of this Notice shall be submitted by the General Contractor, simultaneous with the Closeout Documents, by Affidavit of the publisher and a printed copy of the notice published. If no newspaper is published in the County, the notice must be posted at the Courthouse for thirty (30) days and proof shall be made by the Probate Judge or Sheriff and the Contractor.

## 1.11 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

- A. Submit contractor's Affidavit of Payment of Debts and Claims: AIA G706, or approved equal.
- B. Submit Contractor's Affidavit of Release of Liens: AIA G706A, or approved equal, with:
  - 1. Consent of Surety to Final Payment: AIA G707, or approved equal.
  - 2. Contractor's Release or Waiver of LIENS.
- C. All submittals shall be duly executed before delivery to the Architect.

### 1.12 GENERAL CONTRACTORS GUARANTEE

A. The General Contractor shall submit in addition to any other expressed guarantees and/or warranties, a guarantee of all work under this Contract for a period of one year from date of final acceptance. Also, the General Contractor shall provide the State of Alabama Five-Year Roof Guarantee – if applicable.

#### 1.13 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit final statement of accounting to the Architect. Statement shall reflect all adjustments, including, but not necessarily limited to, the following:
  - 1. Original Contract Sum.
  - 2. Additions and deductions resulting from:
    - a. Previous change orders.
    - b. Cash allowances.
    - c. Unit Prices.
    - d. Other adjustments.
    - e. Deductions for uncorrected work.
    - f. Penalties and bonuses.
    - g. Deductions for liquidated damages.
  - 3. Total Contract Sum, as adjusted.
  - 4. Previous payments.
  - 5. Sum remaining due.

### 1.14 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit final application in accord with requirements of General and/or Supplementary Conditions, simultaneous with the Closeout Documents.

### 1.15 YEAR END INSPECTION

A. Sixty days prior to expiration of one year from date of "Final Acceptance" Contractor shall notify the Architect, in writing, of year-end inspection. Year-end inspection shall occur no more than forty-five and no less than fifteen days before the expiration of the Contractor's one year warranty. The Architect will make visual inspection of project in company with Owner and Contractor to determine whether correction of work is required, in accordance with provisions of General Conditions. For guarantees beyond one year, Architect will make inspections at request of Owner, after notification to Contractor. The Architect will promptly notify Contractor, in writing, of any observed deficiencies.

### END OF SECTION

#### **SECTION 01 78 13 - PROJECT CLOSEOUT CHECKLIST**

(Revised: 31 October 2024)

#### **PART 1 - GENERAL:**

#### 1.01 SUMMARY

A. This Section consists of a shortform checklist for required closeout documents / submittals.

#### 1.02 RELATED SECTIONS

A. Section 01 77 00 - Project Closeout

#### 1.03 REQUIREMENTS

- A. See Section 01 77 00 for the full requirements of each of the follwoing:
  - 1. Fully executed copy of the Certificate of Final Completion with copy of original punchlist
  - 2. Original Affidavit of "Advertisement of Completion" a copy of the ad must be attached to the affidavit form. (Not required if original awarded contract is less than \$100,000.00)
  - 3. General Contractor's Affidavit of Release of Liens
  - 4. General Contractor's Affidavit of Payment of Debts and Claims AIA G706A or approved equal
  - 5. Consent of Surety to Final Payment AIA G707 or approved equal (Not required if original awarded contract is less than \$100,000.00)
  - 6. General Contractors "One Year Guarantee"
  - 7. General Contractor's "State of Alabama Roof Guarantee" if applicable
  - 8. Other warranties as required by contract
  - 9. As-Built Drawings Changes should be legible, in permanent ink, and supplemented by detailed sketches or drawings when necessary
  - 10. Operating and Maintenance Manuals / Submittal / Product Literature & Technical Data

#### 1.04 SUBMITTALS

- A. Closeouts shall be submitted to the Architect in the following packages:
  - Package #1 Final Pay Application Package contains at least two (2) original pay applications with items #1 - #5 attached with binder clip or stapled - not in three ring binder or paper clipped.
  - 2. Package #2 **Warranty Package** contains items #6 #8 attached with binder clip or stapled not in three ring binder or paper clipped.
  - 3. Package #3 **Copy Package** contains copies of items #1 #8 attached with binder clip or stapled not in three ring binder or paper clipped.
  - 4. Package #4 **Compact Disc Package** contains scans of items #1 #10 in PDF format on a single CD, three CDs total, with each item saved by number from 1.03.A (above).

### **SECTION 01 78 39 - PROJECT RECORD DOCUMENTS**

### PART 1 – GENERAL

### 1.01 SUMMARY

- A. This section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings (As-Builts)
  - 2. Record Product Data
- B. Related Sections:
  - 1. Section 01 77 00 Project Closeout

#### 1.02 SUBMITTALS

## 1.03 RECORD DRAWINGS: COMPLY WITH THE FOLLOWING:

- A. Record Drawings number of copies:
  - 1. Punch-list Inspection: Submit one marked-up (red-lined) Record Drawings to the Architect and Owner's Representative at the start of the Punch-list Inspection for review. Any noted deficiencies are to be corrected prior to the Final Inspection.
  - 2. Final Inspection: Submit three marked-up (red-lined) Record Drawings and three electronic CD copies containing all drawings in PDF format to the Owner at the start of the Final Inspection. Failure to provide the Record Prints (hard copy and/or CD), in the required quantities at the start of the Final Inspection, may result in the Owner immediately terminating the Final Inspection.
- B. Record Project Data number of copies:
  - 1. Punch-list Inspection: Submit one set of Record Product Data for each item to the Architect and Owner's Representative at the start of the Punch-list Inspection for review. Any noted deficiencies are to be corrected prior to the Final Inspection.
  - 2. Final Inspection: Submit three sets of corrected, bound Record Product Data and three electronic CD copies containing all Record Product Data in PDF format to the Owner at the start of the Final Inspection. Failure to provide the Record Product Data (hard copy and/or CD), in the required quantities at the start of the Final Inspection, may result in the Owner immediately terminating the Final Inspection.

### PART 2 - PRODUCTS

# 2.01 RECORD DRAWINGS

- A. Record Prints: Maintain one set of black-line white prints of the Contract Drawings and Shop Drawings at Project Site.
  - 1. 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.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

- b. Accurately record information in an understandable drawing technique.
- c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
- d. 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) Depths of foundations below first floor
  - 4) Locations and depths of underground utilities
  - 5) Revisions to routing of piping and conduits
  - 6) Revisions to electrical circuitry
  - 7) Actual equipment locations
  - 8) Duct size and routing
  - 9) Locations of concealed internal utilities
  - 10) Changes made by Change Order or Construction Change Directive
  - 11) Changes made following Contract Modifications
  - 12) Details not on the original Contract Drawings
  - 13) Field records for variable and concealed conditions
  - 14) Record information on the Work that is shown only schematically
  - 15) Changes made by Addenda
  - 16) Changes/Clarifications made by Contract Directive
  - 17) Changes made by approved Shop Drawings
- e. Mark 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 and physically append the Shop Drawings to final Record Drawings.
- f. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
- g. Mark important additional information that was either shown schematically or omitted from original Drawings.
- h. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, Addendum number(s), and similar identification, where applicable.
- B. Record Drawings: When authorized, prepare a full sets of drawings of the corrected Contract Drawings, and record copy of all Shop Drawings.
  - 1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw and add details and notation where applicable.
  - 2. Refer instances of uncertainty to Architect for resolution.
  - 3. Architect will furnish Contractor one set of Contract Drawings in electronic format, or .pdf files, for use in recording information.
  - 4. Print the Contract Drawings and Shop Drawings for use as Record Drawings.
- C. Format: Identify and date Record Drawing; include the designation "PROJECT RECORD DRAWING (AS-BUILTS)" in prominent location on the cover sheet.
  - Record Drawings: Organize into bound sets. Place Drawings in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  - 2. Identification: As follows:

- a. Project name
- b. Date
- c. Designation "PROJECT RECORD DRAWINGS (AS-BUILTS)"
- d. Name of Architect
- e. Name of Contractor

#### 2.02 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.
  - 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.

## **PART 3 – EXECUTION**

## 3.01 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 the 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 Owner's and Architect's reference during normal working hours.

			Maintenan	ice Materials (Attic	Maintenance Materials (Attic Stock)/Replacement Stock List	: Stock List	
Material Name	% Materials	Manufacturer	Mfr. Number	Description	Product Type (mech, elect, HVAC, plumbing, controls, etc.)	Est. Current Cost	Date of Entry
Interior Items							
Ceiling Tiles	2%						
Window coverings	2%						
Ceramic Wall Tiles - field tiles	3%						
Ceramic Wall Tiles - specialty tiles	10%						
Paint	5% - not less than 1 gallon						
Flooring							
Carpet Tiles	2%						
Resilient Base	10 LF per 500 LF						
Resilient Flooring -Tiles	1 Box per 50 Boxes						
Hard Tile	3%						
Grout	2%						
Electrical							
Lamps (each type)	%5						
Exterior Items							
Paint	5% - not less than 1 gallon						
Brick/Split Face CMU	3%						
Wall pack lamps	5% - not less than 1						

## SECTION 01 79 00 - DEMONSTRATION AND TRAINING

## PART 1 – GENERAL

## 1.01 SUMMARY

- A. 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 video recordings.

## B. Related Requirements:

1. Divisions 01 through 49 Sections: Specific requirements for demonstration and training for products in those Sections.

## 1.02 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and 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. This schedule must be submitted to the Architect AT LEAST 14 DAYS IN ADVANCE of the proposed training dates if multiple dates are proposed, then the schedule must be submitted at least 14 days in advance of the earliest date on the schedule. Submission of the schedule after with less than fourteen days before the first date shall be sufficient grounds, by itself, for the Owner to reject the schedule, or any portion of the schedule. If the schedule is rejected by the Owner, then it will be rescheduled at no additional expense to the Owner or Architect. ALL OPERATOR TRAINING MUST TAKE PLACE, AND RECORDINGS (1.03 A.) MUST BE PROVIDED TO ARCHITECT, PRIOR TO THE PUNCH LIST INSPECTION. Failure to conduct and provide recordings prior to the Punch List Inspection will be grounds for cancellation of the Punch List Inspection.
  - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator, instructor, and videographer.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

### 1.03 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two (2) copies within seven (7) days of end of each training module.

- 1. Identification: On each copy, provide an applied label with the following information:
  - a. Name of Project.
  - b. Name and address of videographer.
  - c. Name of Architect.
  - d. Name of Contractor.
  - e. Date of video recording.
- 2. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
- 3. At Final Inspection, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals and in PDF electronic file format on compact disc.

## 1.04 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in "Section 01 40 00 Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Pre-instruction Conference: Conduct conference at Project site. Review methods and procedures related to demonstration and training including, but not limited to, the following:
  - 1. Inspect and discuss locations and other facilities required for instruction.
  - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
  - 3. Review required content of instruction.
  - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

## 1.05 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- 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

## 2.01 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project record documents.
    - e. Identification systems.
    - f. Warranties and bonds.
    - g. Maintenance service agreements and similar continuing commitments.
  - 3. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Instructions on stopping.
    - c. Shutdown instructions for each type of emergency.
    - d. Operating instructions for conditions outside of normal operating limits.
    - e. Sequences for electric or electronic systems.
    - f. Special operating instructions and procedures.
  - 4. Operations: Include the following, as applicable:
    - a. Startup procedures.
    - b. Equipment or system break-in procedures.
    - c. Routine and normal operating instructions.
    - d. Regulation and control procedures.
    - e. Control sequences.
    - f. Safety procedures.
    - g. Instructions on stopping.
    - h. Normal shutdown instructions.
    - i. Operating procedures for emergencies.
    - j. Operating procedures for system, subsystem, or equipment failure.
    - k. Seasonal and weekend operating instructions.

- 1. Required sequences for electric or electronic systems.
- m. Special operating instructions and procedures.
- 5. Adjustments: Include the following:
  - a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
- 6. Troubleshooting: Include the following:
  - a. Diagnostic instructions.
  - b. Test and inspection procedures.
- 7. Maintenance: Include the following:
  - a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
- 8. Repairs: Include the following:
  - a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

## **PART 3 – EXECUTION**

#### 3.01 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual.
- B. Set up instructional equipment at instruction location.

## 3.02 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Owner will furnish Contractor with names and positions of participants.
- 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 Architect with at least fourteen (14) days' advance notice.

- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

## 3.03 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
  - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video: Provide minimum 640 x 480 video resolution converted to format file type acceptable to Owner, on electronic media.
  - 1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
  - 2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
  - 3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
  - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
    - a. Name of Contractor/Installer.
    - b. Business address.
    - c. Business phone number.
    - d. Point of contact.
    - e. E-mail address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
  - 1. Film training session(s) in segments not to exceed 15 minutes.
    - a. Produce segments to present a single significant piece of equipment per segment.
    - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
    - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
  - 1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Pre-produced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

## **END OF SECTION**

## **SECTION 01 91 13 - GENERAL COMMISSIONING REQUIREMENTS**

(Revision Date: 9 April 2021)

## **PART 1 - GENERAL**

## 1.1 DESCRIPTION

- A. Commissioning: Commissioning is a systematic process of ensuring that all building energy systems perform interactively according to the design intent and the Owner's operational needs. The commissioning process for this project shall encompass and coordinate the traditionally separate functions of system documentation, equipment startup, control system calibration, testing and balancing, and performance testing. Commissioning during the construction phase includes a commissioning kick-off meeting, pre-functional checks, and any site visits prior to functional performance testing of mechanical and electrical systems. The acceptance phase includes the functional testing of the mechanical and electrical systems at the time each Bid Item is ready for the Owner's occupancy. Commissioning is intended to achieve the following specific objectives according to the Contract Documents:
  - 1. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted minimum standards and that they receive adequate operational checkout by installing contractors.
  - 2. Verify and document proper performance of equipment and systems.
  - 3. Verify that the Owner's operating personnel are adequately trained.
- B. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product.
- C. Abbreviations: The following are common abbreviations used in the Specifications and in the Commissioning Plan. Definitions are found in Section 1.6.

A/E	Architect/Engineer	FPT	Functional Performance Test
CxA	Commissioning Authority	GC	General Contractor (prime)
CxE	Electrical Commissioning Specialist	CxM	Mechanical Commissioning Specialist
TAB	Test and Balance	PM	
Cx	Commissioning	PFT	Pre-functional Test Checklist

## 1.2 COORDINATION

- A. Commissioning Team: The members of the commissioning team consist of the Commissioning Authority (CxA), the Mechanical Commissioning Specialist (CxM), the Electrical Commissioning Specialist (CxE), the Project Manager (PM), the Field Coordinator (FC), the General Contractor (GC or Contractor), the Architect/Engineer and design engineers (particularly the mechanical and electrical engineers), the Mechanical Contractor (MC), the Electrical Contractor (EC), the TAB representative (TAB), the Controls Contractor (CC), and any other installing subcontractors or suppliers of equipment. If known, the Owner's building or plant operator/engineer is also a member of the commissioning team.
- B. Management: The CxA is hired by the Owner or Owner's Representative directly. The CxA directs and coordinates the commissioning activities and is part of the PM team. All members work together to fulfill their contracted responsibilities and meet the objectives of the Contract Documents. The CxA's responsibilities are the same regardless of who hired the CxA. Refer to Section 019113 Part 1.5 for additional management details.
- C. Scheduling: The CxA will work with the PM, OR, and GC according to protocols established herein to schedule the commissioning activities. The CxA will provide sufficient notice to the OR and GC for scheduling commissioning activities. The GC will integrate all commissioning activities into the master schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.
- D. The CxA will provide the initial schedule of primary commissioning events at the commissioning scoping meeting. The Construction Phase Commissioning Plan provides a format for this schedule. As construction progresses, more detailed schedules are developed by the CxA. The Commissioning Plan also provides a format for detailed schedules.

## 1.3 COMMISSIONING PROCESS

- A. Commissioning Plan: The commissioning plan provides guidance in the execution of the com- missioning process. Just after the initial commissioning scoping meeting, the CxA will update the plan which is then considered the "final" plan, though it will continue to evolve and expand as the project progresses. The Commissioning Plan will act as a complementary document to the Specifications..
- B. Commissioning Process: The following narrative provides a brief overview of the typical com- missioning tasks during construction and the general order in which they occur.
  - 1. Commissioning during construction begins with a scoping meeting conducted by the CxA where the commissioning process is reviewed with the commissioning teammembers.
  - 2. The CxA will provide to the Owner, who will issue to the Contractor as a contract directive, the mechanical and electrical contractors Pre-Functional Test (PFT) procedures that are based on the contract documents, manufacturers' start-up procedures, and best practices developed by the HVAC and Electrical industries.
  - 3. In general, the checkout and performance verification proceeds from simple to

- complex; from component level to equipment to systems and intersystem levels with pre-functional checklists being completed before functional testing.
- 4. The Contractor, under their own direction, execute and document the pre-functional checklists and perform startup and initial checkout. The CxA documents that the checklists and startup were completed according to the approved plans. This may include the CxA or technical Cx representatives witnessing start-up of selected equipment.
- 5. The CxA develops specific equipment and system functional performance test procedures. The Owner will provide the test procedures to the Contractor by contract directive. The Constractor will review the procedures and conduct internal tests of equipment and systems prior to requesting official functional performance testing with the CxA or technical Cx representatives. This helps the Contractor verify that the systems are ready for official testing, and it also minimizes failed tests and retesting efforts.
- 6. The functional performance testing procedures are executed by the Contractor in accordance with the approved schedule and documented by the CxA.
- 7. Items of non-compliance in material, installation, or setup are corrected at the Contractor's sole expense and the system retested.
- 8. Deferred testing is conducted as specified or required.

## 1.4 RELATED WORK

- A. Specific commissioning requirements are given in the following sections of these specifications. All of the following sections apply to the Work of this section.
  - 1. Section 01 77 00 "Project Closeout" defines Substantial Completion and Functional Completion milestones, relative to commissioning.
  - 2. Section 23 08 00 "Commissioning of HVAC Systems" describes the mechanical contractor's responsibilities to commissioning as called out in Section 01 91 13 "General Commissioning Requirements."
  - 3. Section 26 08 00 "Commissioning of Electrical Systems" describes the electrical contractor's responsibilities to commissioning as called out in Section 01 91 13 "General Commissioning Requirements."
  - 4. Section 28 08 00 "Commissioning of Fire Alarm Systems" describes the fire alarm contractor's responsibilities to commissioning as called out in Section 01 91 13 "General Commissioning Requirements."

## 1.5 RESPONSIBILITIES

A. The responsibilities of various parties in the commissioning process are provided in this section. The responsibilities of the mechanical contractor, TAB and controls contractor are in Division 23. The responsibilities of the electrical contractor are in Division 26. The responsibilities of the Fire Alarm Contractor are in Division 28. It is noted that the services for the Project Manager, Field Coordinator, Architect/Engineer, mechanical and electrical designers/engineers, and Commissioning Authority are not provided for in this contract. That is, the Contractor is not responsible for providing their services. Their responsibilities are listed here to clarify the commissioning process.

#### B. All Parties

- 1. Follow the Commissioning Plan.
- 2. Attend commissioning scoping meeting and additional meetings, as necessary.

# C. Commissioning Authority (CxA)

The CxA is not responsible for design concept, design criteria, compliance with codes, design, or general construction scheduling, cost estimating, or construction management. The CxA may assist with problem-solving non-conformance or deficiencies, but ultimately, that responsibility resides with the General Contractor and the A/E. The primary role of the CxA is to develop and coordinate the execution of a testing plan, observe, and document performance that systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents. The Contractors will provide all tools or the use of tools to start, check out, and functionally test equipment and systems, except for specified testing with portable data- loggers, which shall be supplied and installed by the CxA.

## 1. Construction and Acceptance Phases

- a. Coordinates the commissioning activities in a logical, sequential, and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules, and technical expertise.
- b. Plan and conduct a commissioning scoping meeting.
- c. Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up, and checkout procedures.
- d. Before startup, gather and review the current control sequences and interlocks, and work with the Contractor and Architect until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.
- e. Write and distribute pre-functional tests and checklists to the Owner.
- f. Draft pre-functional tests and checklist completion by reviewing prefunctional check-list reports and by site observation and spot checking.
- g. With necessary assistance and review from the Contractor, write the functional performance test procedures for equipment and systems. This may include energy management control system trending, stand-alone datalogger monitoring, or manual functional testing.
- h. Analyze any functional performance trend logs and monitoring data to verify performance.
- i. Coordinate, witness, and perform functional performance tests performed by the Contractor. Coordinate retesting as necessary until satisfactory performance is achieved.
- j. Maintain a master deficiency and resolution log (Issue Log). Provide the PM with electronic copy of issues with recommended actions.
- k. Compile test data, inspection reports, and certificates, and provide a final

commissioning report (as described in this section) to the Owner.

## 2. Warranty Period

a. Coordinate and supervise required seasonal or deferred testing and deficiency corrections.

## D. General Contractor (GC)

# 1. Construction and Acceptance Phase

- a. Facilitate the coordination of the commissioning work by the CxA, and with the PM, ensure that commissioning activities are being scheduled into the master schedule.
- b. Include the cost of commissioning in the total contract price.
- c. Furnish a copy of all construction documents, addenda, change orders, and approved submittals and shop drawings related to commissioned equipment to the CxA.
- d. A representative shall attend a commissioning scoping meeting and other necessary meetings scheduled by the CxA to facilitate the Cx process.
- e. Coordinate owner training on commissioned systems. Provide minimum 10 days' notice prior to scheduling training activities. Provide training agenda and training sign-in sheet to document attendance. Provide copies of training agenda and completed sign-in sheet to CxA.
- f. Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.

## 2. Warranty Period

- a. Ensure that the seasonal or deferred functional performance testing is executed, as witnessed by the CxA, according to the specifications.
- b. Ensure that deficiencies are corrected and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

## 1.6 **DEFINITIONS**

- A. Acceptance Phase phase of construction after startup and initial checkout when functional performance tests, O&M documentation review, and training occurs.
- B. Basis of Design (BOD) The basis of design is the documentation of the primary thought processes and assumptions behind design decisions that were made to meet the design intent. The basis of design describes the systems, components, conditions, and methods chosen to meet the intent. Some reiterating of the design intent may be included.
- C. Commissioning Authority (CxA) an independent agent, not otherwise associated with

the A/E team members or the Contractor, though he/she may be hired as a subcontractor to them. The CxA directs and coordinates the day-to-day commissioning activities. The CxA does not take an oversight role and will not make recommendations to the General Contractor for remediation. The CxA is part of the Owner's team and shall report directly to the Owner.

- D. Commissioning Plan an overall plan, developed before or after bidding, that provides the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.
- E. Control system the central building energy management control system
- F. Data-logging monitoring flows, currents, status, pressures, etc. of equipment using stand-alone data-loggers separate from the control system.
- G. Deferred Functional Performance Tests FPTs that are performed later, after beneficial occupancy or final acceptance, due to partial occupancy, equipment, seasonal requirements, design, or other site conditions that disallow the test from being performed.
- H. Deficiency a condition in the installation or function of a component, piece of equipment, or system that is not in compliance with the Contract Documents (that is, does not perform properly or is not complying with the design intent).
- I. Design Intent (Also see OPR) a dynamic document that provides the explanation of the ideas, concepts, and criteria that are considered to be very important to the owner. It is initially the outcome of the programming and conceptual design phases. Sometimes it is referred to as Owner's Project Requirements.
- J. Design Narrative or Design Documentation sections of either the Design Intent or Basis of Design.
- K. Electrical Commissioning Specialist (CxE) commissioning specialist that reports directly to the CxA and performs the technical work associated with each electrical system to be commissioned.
- L. Factory Testing testing of equipment on-site or at the factory, by factory personnel with an Owner's representative present.
- M. Functional Performance Test (FPT) test of the dynamic function and operation of equipment and systems using manual (direct observation) or monitoring methods. Functional performance testing is the dynamic testing of systems (rather than just components) under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint). Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. The systems are run through all the control system's sequences of operation and components are verified to be responding as the sequences state. Traditional air or water test and balancing (TAB) is not functional

testing, in the commissioning sense of the word. TAB's primary work is setting up the system flows and pressures as specified, while functional testing is verifying that which has already been set up. The commissioning authority develops the functional test procedures in a sequential written form, coordinates, oversees, and documents the actual testing, which is usually performed by the installing contractor or vendor. FPTs are performed after pre-functional checklists, start-up, and TAB are complete.

- N. Indirect Indicators indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100% closed.
- O. Manual Test using hand-held instruments, immediate control system read-outs, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the "observation").
- P. Mechanical Commissioning Specialist (CxM) commissioning specialist that reports directly to the CxA and performs the technical work associated with each mechanical system to be commissioned.
- Q. Monitoring the recording of parameters (flow, current, status, pressure, etc.) of equipment operation using data-loggers or the trending capabilities of control systems.
- R. Non-Compliance see Deficiency.
- S. Non-Conformance see Deficiency,
- T. Over-written Value writing over a sensor value in the control system to see the response of a system (e.g., changing the outside air temperature value from 50°F to 75°F to verify economizer operation). See also "Simulated Signal."
- U. Owner-Contracted Tests tests paid for by the Owner outside the GC's contract. These tests will not be repeated during functional tests if properly documented.
- V. Owner's Project Requirements (OPR) A written document that details the functional requirements of a project and the expectations of how it will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. (The term Design Intent is used by some Owners for their Commissioning Process Owner's Project Requirements.)
- W. Phased Commissioning commissioning that is completed in phases (by floors or by building, for example) due to the size of the structure or other scheduling issues, in order minimize the total construction time.
- X. Pre-functional Test (PFT) a list of items to inspect and elementary component tests to conduct to verify proper installation of equipment, provided by the CxA to the Sub. Pre-functional tests are checklists to primarily conduct static inspections and procedures to prepare the equipment or system for initial operation (e.g., belt tension, oil levels OK, labels affixed, gages in place, sensors calibrated, etc.). However, some pre-functional tests entail simple testing of the function of a component, a piece of equipment, or system

(such as measuring the voltage imbalance on a three-phase pump motor of a chiller system). The word pre-functional refers to before functional testing. Pre-functional tests augment and are combined with the manufacturer's start-up checklist. Even without a commissioning process, contractors typically perform some, if not many, of the pre-functional test items a CxA will recommend. However, few contractors document in writing the execution of these checklist items. Therefore, for most equipment, the contractors execute the checklists on their own. The CxA only requires that the procedures be documented in writing and does not witness much of the pre-functional tests, except for larger or more critical pieces of equipment.

- Y. Recommendations to the Owner acceptance that a piece of equipment or system has been properly installed and is functioning in the tested modes according to the Contract Documents.
- Z. Sampling Functionally testing only a fraction of the total number of identical or near identical pieces of equipment. Refer to 019113 Part 3.5 E.
- AA.. Seasonal Performance Tests FPT that are deferred until the system(s) will experience conditions closer to their design conditions.
- BB. Simulated Condition condition that is created for the purpose of testing the response of a system (e.g., applying a hair blower to a space sensor to see the response in a VAV box).
- CC. Simulated Signal disconnecting a sensor and using a signal generator to send an amperage, resistance, or pressure to the transducer and DDC system to simulate a sensor value.
- DD. Specifications the construction specifications of the Contract Documents
- EE. Startup the initial starting or activating of dynamic equipment, including executing pre-functional checklists
- FF. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.
- GG. Test Procedures the step-by-step process which must be executed to fulfill the test requirements. The test procedures are developed by the CxA, CxM, and CxE.
- HH. Test Requirements requirements specifying what modes and functions, etc., shall be tested. The test requirements are not the detailed test procedures. The test requirements are specified in the Contract Documents (Sections 23 08 00; 26 08 00, etc.).
- II. Trending monitoring using the building control system.

## 1.7 SYSTEMS TO BE COMMISSIONED

A. The following equipment and systems will be commissioned in this project. Equipment types and quantities will vary per Bid Item.

## 1. Mechanical:

- a. Geothermal loop field with associated pumps and heat exchangers
- b. Hydronic building loop pumps
- c. Air/dirt separators
- d. Geothermal water-source heat pumps
- e. Water-cooled variable refrigerant flow (VRF) heat recovery units
- f. Air-cooled VRF outdoor units
- g. VRF indoor evaporator units
- h. Electric cooling / gas heating split-system units
- i. Packaged DX gas-fired air-conditioning units
- j. Ductless air-conditioning units and/or heat pumps
- k. Through-wall heat pump units
- 1. Exhaust/supply fans
- m. Destratification fans
- n. Electric wall heaters
- o. Gas-fired unit heaters
- p. Gas infrared heaters
- q. Dehumidifiers
- r. Kitchen hoods and associated exhaust/supply fans
- s. Carbon monoxide detection system
- t. Gas submeters
- u. Water submeters
- v. Testing, Adjusting and Balancing (TAB) work
- w. Central Building Automation System including linkage of remote monitoring and control sites

### 2. Electrical:

- a. Lighting controls (interior and exterior)
- b. Exit egress lighting
- c. Power
  - i. Service entrance equipment
  - ii. Panelboards
  - iii. Disconnect switches
  - iv. Receptacles
  - v. Manual transfer switches and pin & sleeve connectors
  - vi. Submeters
- d. Fire alarm and mass notification systems

## **PART 2 - PRODUCTS**

## 2.1 TEST EQUIPMENT

A. All standard testing equipment required to perform startup and initial checkout and required functional performance testing shall be provided by the Contractor.

- B. Special equipment, tools, and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment, according to these Contract Documents shall be included in the base bid price to the Contractor and left on site, except for standalone data-logging equipment that may be used by the CxA.
- C. Data-logging equipment and software required to test equipment may be provided by the CxA but shall not become the property of the Contractor.
- D. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5 deg-F and a resolution of + or 0.1 deg-F. Relative humidity sensors and digital hygrometers shall have a certified calibration within the past year to accuracy of + or 2.0% of the value range being measured (not full range of meter). Pressure sensors shall have an accuracy of + or 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year. All equipment shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.
- E. Refer to Part 3.5 E for details regarding equipment that may be required to simulate required test conditions.

## **PART 3 - EXECUTION**

#### 3.1 MEETINGS

A. Scoping Meeting: Within 60 days of commencement of construction, the CxA will schedule, plan, and conduct a commissioning scoping meeting with the entire commissioning team in attendance. Meeting minutes will be distributed to all parties by the CxA. Information gathered from this meeting will allow the CxA to revise the Preliminary Commissioning Plan to its "final" version, which will also be distributed to all parties.

## 3.2 REPORTING

- A. The CxA will provide regular reports to the Owner with increasing frequency as construction and commissioning progresses.
- B. The CxA will regularly communicate with all members of the commissioning team, keeping them apprised of commissioning progress and scheduling changes through memos, progress reports, etc.
- C. Testing or review approvals and non-conformance and deficiency reports are made regularly with the review and testing as described in later sections.
- D. A final summary report (about four to six pages, not including backup documentation) by the CxA will be provided to the Owner, focusing on evaluating commissioning process

issues and identifying areas where the process could be improved. All acquired documentation, logs, minutes, reports, deficiency lists, communications, findings, unresolved issues, etc., will be compiled in appendices and provided with the summary report.

## 3.3 SUBMITTALS

- A. The CxA will provide the Contractor with a specific request for the type of submittal documentation the CxA requires to facilitate the commissioning work. These requests will be integrated into the normal submittal process and protocol of the construction team. At mini- mum, the request will include the manufacturer and model number, the manufacturer's printed installation and detailed start-up procedures, full sequences of operation, O&M data, performance data, any performance test procedures, control drawings, and details of owner contracted tests. ALL SUBMITTALS SHALL BE PROVIDED IN PDF ELECTRONIC FORMAT. In addition, the installation and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the CxA. All documentation requested by the CxA will be included by the Contractor in their O&M manual contributions.
- B. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment, and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The Commissioning Authority will review the submittals concurrently with the Owner and will notify the Owner and PM of items missing or areas that are not in conformance with Contract Documents and which requires resubmission.
- C. The CxA may request additional design narrative from the A/E and/or Contractor, depending on the completeness of the design intent documentation and sequences provided with the Specifications.
- D. These submittals to the CxA do not constitute compliance for O&M manual documentation. The O&M manuals are the responsibility of the Contractor, though the CxA will review them.

# 3.4 START-UP, PREFUNCTIONAL CHECKLISTS, AND INITIAL CHECKOUT

- A. The following procedures apply to all equipment to be commissioned, according to Section 1.7, Systems to be Commissioned. Some systems that are not comprised of actual dynamic machinery, e.g., electrical system power quality, may have very simplified PFC's and startup.
- B. General. Pre-functional checklists are important to ensure that the equipment and systems are hooked up and operational. It ensures that functional performance testing (in-depth system checkout) may proceed without unnecessary delays. Each piece of equipment receives full pre-functional checkout. No sampling strategies are used. The pre-functional testing for a given system must be successfully completed prior to formal functional

Huntsville, AL

performance testing of equipment or subsystems of the given system.

- C. Start-up and Initial Checkout Plan: The CxA shall assist the commissioning team members responsible for startup of any equipment in developing detailed start-up plans for all equipment. The primary role of the CxA in this process is to ensure that there is written documentation that each of the manufacturer-recommended procedures have been completed. Parties responsible for pre-functional checklists and startup are identified in the commissioning scoping meeting and in the checklist forms.
  - 1. The CxA adapts, if necessary, the representative pre-functional checklists and procedures from the Commissioning Plan. These checklists indicate required procedures to be executed as part of startup and initial checkout of the systems and the party responsible for their execution.
  - 2. These checklists and tests are provided by the CxA to the Contractor. The Contractor determines which trade is responsible for executing and documenting each of the line item tasks and notes that trade on the form. Each form will have more than one trade responsible for its execution.
  - 3. The Contractor is responsible for developing the full start-up plan by combining (or adding to) the CxA's checklists with the manufacturer's detailed start-up and checkout procedures from the O&M manual and the normally used field checkout sheets. The plan will include checklists and procedures with specific boxes or lines for recording and documenting the checking and inspections of each procedure and a summary statement with a signature block at the end of the plan.

The full start-up plan could consist of something as simple as:

- a. The CxA copies the manufacturer's startup and initial checkout procedures from O&M submittals.
- b. The CxA marks the applicable areas in the procedures and makes initial and date lines at each procedure or section.
- c. The CxA transmits these procedures and the original pre-functional checklist procedures (see 1 above) to the Contractor as the startup and initial checkout plan.
- 4. The Contractor submits the full startup plan to the CxA for review and approval.
- 5. The CxA reviews and approves the procedures and the format for documenting them, noting any procedures that need to be added.

## D. Execution of Pre-Functional Checklists and Startup

- 1. Four weeks prior to startup, the Contractor schedules startup and checkout with the PM, A/E, and CxA. The performance of the pre-functional checklists, startup, and checkout are directed and executed by the designee of the Contractor (i.e., Sub or vendor). When checking off pre-functional checklists, signatures may be required for verification of completion of their work.
- 2. The Contractor's designee (i.e., Subs and vendors) shall execute startup and provide the CxA with a signed and dated copy of the completed start-up and pre-functional tests and checklists.

- 3. Only individuals that have direct knowledge and witnessed that a line-item task on the pre-functional checklist was actually performed shall initial or check that item off. It is not acceptable for witnessing supervisors to fill out these forms.
- E. Deficiencies, Non-Conformance, and Approval in Checklists and Startup.
  - 1. The Contractor shall clearly list any outstanding items of the initial start-up and pre-functional procedures that were not completed successfully, at the bottom of the procedures form or on an attached sheet. The procedures form and any outstanding deficiencies are provided to the CxA within two days of test completion.
  - 2. The CxA reviews the report and submits either a non-compliance report or an approval form to the Contractor, A/E, and PM. The CxA shall work with the Contractor to correct and re-test deficiencies or uncompleted items. The CxA will involve the PM and others as necessary. The Contractor shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner and shall notify the CxA as soon as outstanding items have been corrected and resubmit an updated start-up report and a Statement of Correction on the original non-compliance report. When satisfactorily completed, the CxA recommends approval of the execution of the checklists and startup of each system to the PM using a standard form.
  - 3. Items left incomplete, which later cause deficiencies or delays during functional testing, may result in back-charges to the responsible party. Refer to Part 3.6 herein for details.

#### 3.5 FUNCTIONAL PERFORMANCE TESTING

- A. This sub-section applies to all commissioning functional testing for all divisions.
- B. The general list of equipment to be commissioned is found in Paragraph 1.7.
- C. Objectives and Scope: The objective of functional performance testing is to demonstrate that each system is operating according to the documented design intent and Contract Documents. Functional testing facilitates bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems.
  - In general, each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part-and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc., shall also be tested.
- D. Development of Test Procedures. Before test procedures are written, the CxA shall obtain all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, program code, control sequences and parameters. Using the testing parameters and requirements in Sections 23 08 00, 26 08 00, and 28 08 00, the CxA shall develop specific test procedures and forms to verify and

document proper operation of each piece of equipment and system. The Contractor shall provide limited assistance to the CxA in developing the procedures review (answering questions about equipment, operation, sequences, etc.). Prior to execution, the CxA shall provide a copy of the test procedures to the Contractor who shall review the tests for feasibility, safety, equipment, and warranty protection. The CxA may submit the tests to the A/E for review, if requested by the Owner.

The test procedure forms developed by the CxA shall include (but not be limited to) the following information:

- 1. System and equipment or component name(s)
- 2. Equipment location and ID number
- 3. Unique test ID number and reference to unique pre-functional checklist and startup documentation ID numbers for the piece of equipment
- 4. Date
- 5. Project name
- 6. Participating parties
- 7. A copy of the specification section describing the test requirements
- 8. A copy of the specific sequence of operations or other specified parameters being verified
- 9. Formulas used in any calculations
- 10. Required pre-test field measurements
- 11. Instructions for setting up the test.
- 12. Special cautions, alarm limits, etc.
- 13. Specific step-by-step procedures to execute the test, in a clear, sequential, and repeatable format
- 14. Acceptance criteria of proper performance with a Yes / No check box to allow for clearly marking whether or not proper performance of each part of the test was achieved.
- 15. A section for comments
- 16. Signatures and date block for the CxA

## E. Test Methods.

- 1. Functional performance testing and verification may be achieved by manual testing (per- sons manipulate the equipment and observe performance) or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by stand-alone data-loggers. CxA may substitute specified methods or require an additional method to be executed, other than what was specified, with the approval of the Owner. This may require a change order and adjustment in charge to the Owner. The CxA will determine which method is most appropriate for tests that do not have a method specified.
- F. Coordination and Scheduling: The Contractor shall provide sufficient notice to the CxA regarding their completion schedule for the pre-functional checklists and startup of all equipment and systems. The CxA will schedule functional tests through the PM, GC, and A/E. The CxA or technical Cx representatives shall direct, witness, and document the functional testing of all equipment and systems. The Contractor shall execute the tests.

In general, functional testing is conducted after pre-functional testing and startup has been satisfactorily completed. The control system must have been sufficiently tested by the Contractor and found in accordance with the Contract Documents by the CxA before it is used for TAB or to verify performance of other components or systems. The air and water balancing is to be completed and de-bugged before functional testing of air-related or water-related equipment or systems. Testing proceeds from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems is checked. The Contractor is responsible for reviewing the functional testing procedure documents provided by the CxA and conducting internal tests of equipment and systems prior to requesting official functional performance testing with the CxA or technical Cx representatives. This allows the Contractor to verify that the systems are ready for official testing, and it also minimizes failed tests and retesting efforts. Functional Performance Testing will occur simultaneously for all buildings in a particular Bid Item, so all systems and equipment in that Bid Item must be ready for final testing prior to the arrival of the CxA. If the CxA, CxM, or CxE arrive on-site for FPT's and it becomes evident that some or all systems are not ready for final testing (i.e., other than minor operational issues, equipment and systems do not perform as expected when going through the various control sequences), the tests will be considered "failed." The Owner reserves the right to deduct from the Contract Amount the costs to the Owner for re-testing for failed tests.

SS&L# 21112

G. Problem Solving: The CxA will recommend solutions to problems found. However, the burden of responsibility to solve, correct, and retest problems is with the Contractor.

## 3.6 DOCUMENTATION, NON-CONFORMANCE, AND APPROVAL OF TESTS

A. Documentation: The CxA, CxM, or CxE shall witness and document the results of all functional performance tests using the specific procedural forms developed for that purpose. Prior to testing, these forms are provided to the Contractor for review. The CxA will include the filled-out forms in the final commissioning report.

### B. Non-Conformance

- 1. The CxA will record the results of the functional test on the procedure or test form. All deficiencies or non-conformance issues shall be noted and reported to the Owner on a standard non-compliance form.
- 2. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA. In such cases the deficiency and resolution will be documented on the procedure form.
- 3. Every effort will be made to expedite the testing process and minimize unnecessary de-lays, while not compromising the integrity of the procedures. However, the CxA will not be pressured into overlooking deficient work or loosening acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so at the request of the Owner.
- 4. As tests progress and a deficiency is identified, the CxA discusses the issue with the Contractor.

- a. When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it:
  - The CxA documents the deficiency and the Contractor's response and intentions and they go on to another test or sequence. The deficiency is added to the Issue Log. A copy is provided to the Contractor and CxA. The Contractor corrects the deficiency, signs the Issue Log correction certifying that the equipment is ready to be retested and sends it back to the CxA.
  - 2) The CxA reschedules the test and the test is repeated.

SS&L# 21112

- b. If there is a dispute about a deficiency regarding whether it is a deficiency or who is responsible:
  - 1) The deficiency shall be documented on the non-compliance form with the Contractor's response and a copy given to the Owner and to the A/E.
  - 2) Resolutions are made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive authority is with the Owner. Final acceptance authority is also with the Owner
  - 3) The CxA documents the resolution process.
  - 4) Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency, signs the statement of correction on the non-compliance form, and provides it to the CxA. The CxA reschedules the test and the test is repeated until satisfactory performance is achieved.

## 5. Cost of Retesting

- a. The cost of retesting will be allocated in accordance with the General Conditions of the Contract.
- 6. The Contractor shall respond in writing to the CxA and Owner at least as often as commissioning meetings are being scheduled concerning the status of each apparent outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreements and proposals for their resolution.
- 7. The CxA retains the original non-conformance forms until the end of the project.
- 8. Any required retesting by the Contractor shall not be considered a justified reason for a claim of delay or for a time extension.
- C. Failure Due to Manufacturer Defect: If 10%, or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered

unacceptable by the Owner. In such case, the Contractor shall provide the Owner with the following:

- 1. Within one week of notification from the Owner, the Contractor or manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Owner within two weeks of the original notice.
- 2. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
- 3. The Owner will determine whether a replacement of all identical units or a repair is acceptable.
- 4. Two examples of the proposed solution will be installed by the Contractor, and the Owner will be allowed to test the installations for up to one week, upon which the Owner will decide whether to accept the solution.
- 5. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.
- D. Approval: The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA and by the Owner. The CxA recommends acceptance of each test to the Owner using a standard form. The Owner gives final approval on each test using the same form, providing a signed copy to the CxA and the Contractor.

## 3.7 OPERATION AND MAINTENANCE MANUALS

#### A. Standard O&M Manuals

1. The specific content and format requirements for the standard O&M manuals are detailed in Section 01 77 00.

## B. Commissioning Report

- 1. The CxA is responsible to compile, organize, and index the following commissioning data by equipment into labeled, indexed, and tabbed electronic media and deliver it to the Owner. The format of the manuals shall be:
  - a. Executive Summary
  - b. Cx Meeting Minutes
  - c. Commissioning Specifications
  - d. Commissioning Plan
  - e. Issue Log
  - f. Commissioning Forms (Pre-functional Test forms, Functional Performance Test Forms and Trend Log)
  - g. Equipment Start-up Reports

- h. Training Reports
- i. Additional Forms and Reports (TAB Report, BAS Point-to Point Check List, As-Built Control Drawings, O&M Manuals).

#### 3.8 DEFERRED TESTING

- A. Unforeseen Deferred Tests: If any check or test cannot be completed due to the building structure, required occupancy condition, or other deficiency, execution of checklists and functional testing may be delayed upon approval of the Owner. These tests will be conducted in the same manner as the seasonal tests as soon as possible. Services of necessary parties will be negotiated.
- B. Seasonal Testing: During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) specified in Section 23 08 00 shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the Contractor, with PM facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and as-builts due to the testing will be made.

## 3.9 WRITTEN WORK PRODUCTS

A. The commissioning process generates a number of written work products described in various parts of the Specifications. The Commissioning Plan—Construction Phase, lists all the formal written work products, describes briefly their contents, who is responsible to create them, their due dates, who receives and approves them, and the location of the specification to create them. In summary, the written products are as follows:

Product Developed By

1.	Final commissioning plan	CxA
2.	Meeting minutes	CxA
3.	Commissioning schedules	CxA with GC and PM
4.	Equipment documentation submittals	GC
5.	Sequence clarifications	GC and A/E as needed
6.	Pre-functional checklists	CxA
7.	Startup and initial checkout plan	GC and CxA (compilation of
		existing documents)
8.	Startup and initial checkout	GC forms filled out
9.	Final TAB report	TAB
10	Issues log (deficiencies)	CxA
11.	Commissioning Progress Record	CxA
12.	Deficiency reports	CxA
13.	Functional test forms	CxA
14.	Final commissioning report	CxA

#### **END OF SECTION 01 91 13**

### **SECTION 02 4100 - DEMOLITION**

## <<<< UPDATE NOTES

#### PART 1 GENERAL

## 2.01 SECTION INCLUDES

- A. Selective demolition of built site elements.
- B. Selective demolition of building elements for alteration purposes.
- C. Abandonment and removal of existing utilities and utility structures.

# 2.02 RELATED REQUIREMENTS

- A. Section 01 5000 Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- B. Section 31 2200 Grading: Rough and fine grading.
- C. Section 31 2323 Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

## 2.03 REFERENCE STANDARDS

- A. 29 CFR 1926 Safety and Health Regulations for Construction; Current Edition.
- B. NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

### 2.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements for submittal procedures.
- B. Site Plan: Indicate:
  - 1. Vegetation to be protected.
  - 2. Areas for temporary construction and field offices.
- C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

## PART 2 PRODUCTS -- NOT USED

## **PART 3 EXECUTION**

#### 4.01 DEMOLITION

- A. Remove portions of existing building as required by new construction.
  - 1. see drawings.
- B. Visit site prior to bid and verify all existing conditions, existing structures, finishes, and location of work area.
- C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 2200.

## 4.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
  - 1. Obtain required permits.
  - 2. Use of explosives is not permitted.
  - 3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
  - 4. Provide, erect, and maintain temporary barriers and security devices.
  - 5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
  - 6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  - 7. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
  - 8. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
  - 9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

- 10. Buildings Occupancy: The building will be occupied. Work may be accomplished during normal hours. Notify the owner 48 hours in advance if any demolition will result in excessive noise or vibration which may be sensed in the area. Contractor to seal off all work areas and maintain fire exiting for the building.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements that are not to be removed (including adjacent builings).
  - 1. Provide bracing and shoring.
  - 2. Prevent movement or settlement of adjacent structures.
  - 3. Stop work immediately if adjacent structures appear to be in danger.
- D. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

### 4.03 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

## 4.04 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
  - 1. Verify construction and utility arrangements are as indicated.
  - 2. Report discrepancies to Architect before disturbing existing installation.
  - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Remove existing work as indicated and required to accomplish new work.
  - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
  - 2. Remove items indicated on drawings.
- C. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
  - 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
  - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
  - 3. Verify that abandoned services serve only abandoned facilities before removal.
  - 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- D. Protect existing work to remain.
  - 1. Prevent movement of structure. Provide shoring and bracing as required.
  - 2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
  - 3. Repair adjacent construction and finishes damaged during removal work.
  - 4. Patch to match new work.

#### 4.05 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.
- D. All demolished materials shall become the property of the Contractor and shall be removed from the site by the Contractor unless noted otherwise in Contract Documents.
- E. The Contractor shall select haul routes, obtain required approval of local authorities, and conduct its operations in such manner as to insure minimum interference with roads, street, sidewalks, and neighboring buildings and facilities and so that there is no interference with the normal operations of the building.
- F. The Contractor shall obtain all necessary permits and comply with all statutes, ordinances, codes and regulations applicable to the work to be performed.
- G. The Contractor shall take all precautions necessary to assure that the work will be performed in a manner that will not endanger the public, any workman, or any property in the vicinity of the work.
- H. The Contractor shall take such actions as shall be necessary to assure that members of the public will have safe passage on the public streets around the area of demolition, and construct such fencing, barricades and obstacles as will prevent unauthorized entry to the work site.

#### END OF SECTION 02 4100

This page intentionally left blank

#### SECTION 03 20 00 - CONCRETE REINFORCING

## **PART 1 - GENERAL**

#### 1.01 SUMMARY

- A. Section Includes:
  - 1. Steel reinforcement bars.
  - 2. Welded-wire reinforcement.
- B. Related Requirements:
  - 1. Section 32 13 13 "Concrete Paving" for reinforcing related to concrete pavement and walks.

## 1.02 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review the following:
    - a. Special inspection and testing and inspecting agency procedures for field quality control.
    - b. Construction contraction and isolation joints.
    - c. Steel-reinforcement installation.

## 1.03 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Each type of steel reinforcement.
  - 2. Bar supports.
- B. Shop Drawings: Comply with ACI SP-066:
  - 1. Include placing drawings that detail fabrication, bending, and placement.
  - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, tie spacing, hoop spacing, and supports for concrete reinforcement.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
  - 1. Location of construction joints is subject to approval of Architect.

## 1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Statements: For inspection agency.
- B. Field quality-control reports.
- C. Minutes of preinstallation conference.

## 1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

## 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
  - 1. Store reinforcement to avoid contact with earth.

## **PART 2 - PRODUCTS**

#### 2.01 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60 deformed.
- B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

#### 2.02 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
  - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
    - a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
- B. Stainless Steel Tie Wire: ASTM A1022/A1022M, not less than 0.0508 inch in diameter.

## 2.03 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

# **PART 3 - EXECUTION**

#### 3.01 PREPARATION

- A. Protection of In-Place Conditions:
  - 1. Do not cut or puncture vapor retarder.
  - 2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

### 3.02 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
  - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
  - 2. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
  - 1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
  - 2. Stagger splices in accordance with ACI 318.
- G. Install welded-wire reinforcement in longest practicable lengths.
  - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
    - a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 12 inches.
  - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
  - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
  - 4. Lace overlaps with wire.

#### **3.03 JOINTS**

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
  - 1. Place joints perpendicular to main reinforcement.
  - 2. Continue reinforcement across construction joints unless otherwise indicated.
  - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.
- B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

## 3.04 INSTALLATION TOLERANCES

A. Comply with ACI 117.

# 3.05 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
  - 1. Steel-reinforcement placement.

# **END OF SECTION**

#### SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

## **PART 1 - GENERAL**

#### 1.01 SUMMARY

#### A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

## B. Related Requirements:

 Section 03 20 00 "Concrete Reinforcing" for steel reinforcing bars and weldedwire reinforcement.

## 1.02 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

#### 1.03 ACTION SUBMITTALS

- A. Product Data: For each of the following.
  - 1. Portland cement.
  - 2. Fly ash.
  - 3. Slag cement.
  - 4. Blended hydraulic cement.
  - 5. Silica fume.
  - 6. Performance-based hydraulic cement
  - 7. Aggregates.
  - 8. Admixtures:
    - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
  - 9. Color pigments.
    - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
  - 10. Fiber reinforcement.
  - 11. Vapor retarders.
  - 12. Floor and slab treatments.
  - 13. Liquid floor treatments.
  - 14. Curing materials.
  - 15. Joint fillers.

- 16. Repair materials.
- B. Design Mixtures: For each concrete mixture, include the following:
  - 1. Mixture identification.
  - 2. Minimum 28-day compressive strength.
  - 3. Durability exposure class.
  - 4. Maximum w/cm.
  - 5. Calculated equilibrium unit weight, for lightweight concrete.
  - 6. Slump limit.
  - 7. Air content.
  - 8. Nominal maximum aggregate size.
  - 9. Steel-fiber reinforcement content.
  - 10. Synthetic micro-fiber content.
  - 11. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
  - 12. Intended placement method.
  - 13. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

# C. Shop Drawings:

- 1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
  - a. Location of construction joints is subject to approval of the Architect.
- D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:
  - 1. Concrete Class designation.
  - 2. Location within Project.
  - 3. Exposure Class designation.
  - 4. Formed Surface Finish designation and final finish.
  - 5. Final finish for floors.
  - 6. Curing process.
  - 7. Floor treatment if any.

## 1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For the following:
  - 1. Installer: Include copies of applicable ACI certificates.
  - 2. Ready-mixed concrete manufacturer.
  - 3. Testing agency: Include copies of applicable ACI certificates.
- B. Material Certificates: For each of the following, signed by manufacturers:
  - 1. Cementitious materials.
  - 2. Admixtures.
  - 3. Fiber reinforcement.
  - 4. Curing compounds.
  - 5. Floor and slab treatments.

- 6. Bonding agents.
- 7. Adhesives.
- 8. Vapor retarders.
- 9. Semirigid joint filler.
- 10. Joint-filler strips.
- 11. Repair materials.
- C. Material Test Reports: For the following, from a qualified testing agency:
  - 1. Portland cement.
  - 2. Fly ash.
  - 3. Slag cement.
  - 4. Blended hydraulic cement.
  - 5. Silica fume.
  - 6. Performance-based hydraulic cement.
  - 7. Aggregates.
  - 8. Admixtures:
    - a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.
- D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances.
- E. Research Reports:
  - 1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
  - 2. For sheet vapor retarder/termite barrier, showing compliance with ICC AC380.
- F. Preconstruction Test Reports: For each mix design.
- G. Field quality-control reports.

# 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician.
- B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
  - 1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.

- 1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor to be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Field Quality-Control Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
  - 1. Personnel conducting field tests to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.
- E. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
  - 1. Include the following information in each test report:
    - a. Admixture dosage rates.
    - b. Slump.
    - c. Air content.
    - d. Seven-day compressive strength.
    - e. 28-day compressive strength.
    - f. Permeability.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

#### 1.07 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.
  - 1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  - 3. Do not use frozen materials or materials containing ice or snow.
  - 4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
  - 5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
  - 1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
  - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

## **PART 2 - PRODUCTS**

# 2.01 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

## 2.02 CONCRETE MATERIALS

- A. Source Limitations:
  - 1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
  - 2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
  - 3. Obtain aggregate from single source.
  - 4. Obtain each type of admixture from single source from single manufacturer.
- B. Cementitious Materials:
  - 1. Portland Cement: ASTM C150/C150M, Type II, gray.
  - 2. Fly Ash: ASTM C618, Class C or F.
- C. Normal-Weight Aggregates: ASTM C33/C33M, 1N coarse aggregate or better, graded. Provide aggregates from a single source.
  - 1. Maximum Coarse-Aggregate Size: 3/4" inches nominal.
  - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C260/C260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
  - 2. Retarding Admixture: ASTM C494/C494M, Type B.
  - 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
  - 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
  - 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
  - 6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

## 2.03 FIBER REINFORCEMENT

A. Synthetic Monofilament Micro-Fiber: Monofilament polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C1116/C1116M, Type III, 1/2 to 1-1/2 inches long.

#### 2.04 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
  - 1. Color:
    - a. Ambient Temperature Below 50 deg F: Black.
    - b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
    - c. Ambient Temperature Above 85 deg F: White.
- C. Water: Potable or complying with ASTM C1602/C1602M.
- D. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.
- E. Clear, Waterborne, Membrane-Forming, Nondissipating Curing Compound: ASTM C309, Type 1, Class B, certified by curing compound manufacturer to not interfere with bonding of floor covering.
- F. Clear, Waterborne, Membrane-Forming, Curing Compound: ASTM C309, Type 1, Class B, 18 to 25 percent solids, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

#### 2.05 VAPOR RETARDERS

- A. Vapor Barrier: Provide vapor barrier cover over prepared base material where indicated. Use only materials which meet ASTM 1745-09, not less than 15 mils thick, and are resistant to decay when tested in accordance with ASTM E154. Product must maintain a permeance of less than 0.01 perms after mandatory conditioning tests include in ASTM E 1745-09. Lap vapor barrier a minimum of 6" at all locations. Tape all joints per manufacturer.
  - 1. Equal to W.R. Meadows 15 mil "Perminator"

## 2.06 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
- B. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

## 2.07 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
  - 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
  - 1. Fly Ash or Other Pozzolans: 25 percent by mass.
  - 2. Slag Cement: 50 percent by mass.
  - 3. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
  - 4. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
  - 1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  - 3. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.

## 2.08 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.

## **PART 3 - EXECUTION**

## 3.01 EXAMINATION

- A. Verification of Conditions:
  - 1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
  - 2. Do not proceed until unsatisfactory conditions have been corrected.

## 3.02 PREPARATION

- A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
  - 1. Daily access to the Work.
  - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
  - 3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
  - 4. Security and protection for test samples and for testing and inspection equipment at Project site.

### 3.03 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
  - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
  - 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

#### 3.04 INSTALLATION OF VAPOR RETARDER

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.
  - 1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
  - 2. Face laps away from exposed direction of concrete pour.
  - 3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
  - 4. Lap joints 6 inches and seal with manufacturer's recommended tape.
  - 5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
  - 6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
  - 7. Protect vapor retarder during placement of reinforcement and concrete.
    - a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.
- B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder in accordance with manufacturer's written instructions

## **3.05 JOINTS**

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
  - 1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
  - 2. Place joints perpendicular to main reinforcement.
    - a. Continue reinforcement across construction joints unless otherwise indicated.
    - b. Do not continue reinforcement through sides of strip placements of floors and slabs.
  - 3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

- 4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
- 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
- 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
  - 1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  - 2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
  - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
  - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

## E. Doweled Joints:

- 1. Install dowel bars and support assemblies at joints where indicated on Drawings.
- 2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

## 3.06 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
  - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
  - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
  - 1. If a section cannot be placed continuously, provide construction joints as indicated.
  - 2. Deposit concrete to avoid segregation.
  - 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
    - a. Do not use vibrators to transport concrete inside forms.
    - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Do not place concrete floors and slabs in a checkerboard sequence.
  - 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 3. Maintain reinforcement in position on chairs during concrete placement.
  - 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
  - 5. Level concrete, cut high areas, and fill low areas.
  - 6. Slope surfaces uniformly to drains where required.
  - 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
  - 8. Do not further disturb slab surfaces before starting finishing operations.

#### 3.07 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

- 1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
  - a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
  - b. Remove projections larger than 1 inch.
  - c. Tie holes do not require patching.
  - d. Surface Tolerance: ACI 117 Class D.
  - e. Apply to concrete surfaces not exposed to public view.
- 2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
  - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
  - b. Remove projections larger than 1/4 inch.
  - c. Patch tie holes.
  - d. Surface Tolerance: ACI 117 Class B.
  - e. Locations: Apply to concrete surfaces
- 3. ACI 301 Surface Finish SF-3.0:
  - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
  - b. Remove projections larger than 1/8 inch.
  - c. Patch tie holes.
  - d. Surface Tolerance: ACI 117 Class A...
  - e. Locations: Apply to concrete surfaces exposed to public view.

#### B. Related Unformed Surfaces:

- 1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
- 2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

## 3.08 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

### B. Float Finish:

- 1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
- 2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
- 3. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

## C. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.

SS&L# 21112

- 2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
- 3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
- 4. Do not add water to concrete surface.
- 5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
- 6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
- 7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:
  - a. Slabs on Ground:
    - 1) Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft. long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.
- D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated on Drawings, where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
  - 1. Coordinate required final finish with Architect before application.
  - 2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
  - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
  - 2. Coordinate required final finish with Architect before application.

## 3.09 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

#### A. Filling In:

- 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
- 2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
- 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
  - 1. Coordinate sizes and locations of concrete bases with actual equipment provided.

- 2. Construct concrete bases 6 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
- 3. Minimum Compressive Strength: 3000 psi at 28 days.
- 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
- 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
- 6. Prior to pouring concrete, place and secure anchorage devices.
  - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - b. Cast anchor-bolt insert into bases.
  - c. Install anchor bolts to elevations required for proper attachment to supported equipment.

## 3.10 CONCRETE CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
  - 1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
  - 2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
  - 3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305.1, before and during finishing operations.
- B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
  - 1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
  - 2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
  - 3. If forms remain during curing period, moist cure after loosening forms.
  - 4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
    - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
    - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
    - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
    - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
    - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
      - 1) Recoat areas subject to heavy rainfall within three hours after initial application.

- 2) Maintain continuity of coating and repair damage during curing period.
- C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
  - 1. Begin curing immediately after finishing concrete.
  - 2. Interior Concrete Floors:
    - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
      - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
        - a) Lap edges and ends of absorptive cover not less than 12 inches.
        - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
      - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
        - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
        - b) Cure for not less than seven days.
      - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
        - a) Water.
        - b) Continuous water-fog spray.
    - b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
      - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
        - a) Lap edges and ends of absorptive cover not less than 12 inches.
        - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
      - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
        - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
        - b) Cure for not less than seven days.
      - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
        - a) Water.
        - b) Continuous water-fog spray.
    - c. Floors to Receive Polished Finish: Contractor has option of the following:

- 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
  - a) Lap edges and ends of absorptive cover not less than 12 inches.
  - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
- 2) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
  - a) Water.
  - b) Continuous water-fog spray.
- d. Floors to Receive Chemical Stain:
  - 1) As soon as concrete has sufficient set to permit application without marring concrete surface, install curing paper over entire area of floor.
  - 2) Install curing paper square to building lines, without wrinkles, and in a single length without end joints.
  - 3) Butt sides of curing paper tight; do not overlap sides of curing paper.
  - 4) Leave curing paper in place for duration of curing period, but not less than 28 days.
- e. Floors to Receive Urethane Flooring:
  - 1) As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
  - 2) Rewet absorptive cover, and cover immediately with polyethylene moisture-retaining cover with edges lapped 6 inches and sealed in place.
  - 3) Secure polyethylene moisture-retaining cover in place to prohibit air from circulating under polyethylene moisture-retaining cover.
  - 4) Leave absorptive cover and polyethylene moisture-retaining cover in place for duration of curing period, but not less than 28 days.
- f. Floors to Receive Curing Compound:
  - 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
  - 3) Maintain continuity of coating, and repair damage during curing period.
  - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.
- g. Floors to Receive Curing and Sealing Compound:
  - 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
  - 3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

#### 3.11 TOLERANCES

A. Conform to ACI 117.

## 3.12 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.
  - 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
  - 2. Do not apply to concrete that is less than seven days' old.
  - 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
  - 4. Rinse with water; remove excess material until surface is dry.
  - 5. Apply a second coat in a similar manner if surface is rough or porous.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

## 3.13 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
  - 1. Testing agency to be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
  - 2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
  - 3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
    - a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
      - 1) Project name.
      - 2) Name of testing agency.
      - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
      - 4) Name of concrete manufacturer.
      - 5) Date and time of inspection, sampling, and field testing.
      - 6) Date and time of concrete placement.
      - 7) Location in Work of concrete represented by samples.
      - 8) Date and time sample was obtained.

- 9) Truck and batch ticket numbers.
- 10) Design compressive strength at 28 days.
- 11) Concrete mixture designation, proportions, and materials.
- 12) Field test results.
- 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
- 14) Type of fracture and compressive break strengths at seven days and 28 days.
- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

# D. Inspections:

- 1. Headed bolts and studs.
- 2. Verification of use of required design mixture.
- 3. Concrete placement, including conveying and depositing.
- 4. Curing procedures and maintenance of curing temperature.
- 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
- 6. Batch Plant Inspections: On a random basis, as determined by Architect.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:
  - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
    - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  - 2. Slump: ASTM C143/C143M:
    - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    - b. Perform additional tests when concrete consistency appears to change.
  - 3. Slump Flow: ASTM C1611/C1611M:
    - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    - b. Perform additional tests when concrete consistency appears to change.
  - 4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete.
    - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - 5. Concrete Temperature: ASTM C1064/C1064M:
    - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

- 6. Compression Test Specimens: ASTM C31/C31M:
  - a. Cast and laboratory cure two sets of two 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
  - b. Cast, initial cure, and field cure two sets of two standard cylinder specimens for each composite sample.
- 7. Compressive-Strength Tests: ASTM C39/C39M.
  - a. Test one set of three laboratory-cured specimens at seven days and one set of two specimens at 28 days.
  - b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
  - c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
- 8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- 9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
- 10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- 11. Additional Tests:
  - a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
  - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
    - 1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.6.6.3.
- 12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- F. Measure floor and slab flatness and levelness in accordance with 72 hours of completion of floor finishing and promptly report test results to Architect.

## 3.14 PROTECTION

- A. Protect concrete surfaces as follows:
  - 1. Protect from petroleum stains.

- 2. Diaper hydraulic equipment used over concrete surfaces.
- 3. Prohibit vehicles from interior concrete slabs.
- 4. Prohibit use of pipe-cutting machinery over concrete surfaces.
- 5. Prohibit placement of steel items on concrete surfaces.
- 6. Prohibit use of acids or acidic detergents over concrete surfaces.
- 7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
- 8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

## END OF SECTION

# SECTION 03 3680 - CONCRETE POLISHING AND DYING

## PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

## 1.02 SUMMARY

- A. This Section includes polished concrete finish for interior concrete floors denoted in the Drawings as "Polished Concrete". Polished concrete 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 polishing of concrete floors.
- C. Applying densifying impregnator/sealer and polishing to specified sheen level and aggregate exposure.
- D. Concrete must be cured a minimum of 28 days prior to polishing.
- E. Installation of Polished Concrete indicates acceptance of the concrete substrate.

#### 1.03 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. ASTMG23-81, Ultraviolet Light and Water Spray
  - 4. ASTM 1028, Co-Efficient of Friction
  - 5. ASTM C 150, Type I, II Portland cement conformity, depending on soil conditions
  - 6. ASTM C 33, Aggregate conformity

## 1.04 SUBMITTALS

A. Submit the following in accordance with Submittal Procedures in Division 1 Sections.

- B. Product data for concrete densifying impregnator, penetrating sealer, concrete dyes, joint filler and any other chemicals used in the process.
- C. Applicators qualification data.
- D. Polished concrete samples: size 6"x6" for each Polished Concrete finish required.
- E. Maintenance procedures for Polished Concrete using diamond impregnated cleaning pads.

## 1.05 QUALITY ASSURANCE

- A. Basis of design: Polished Concrete
- B. Certified Contractors:
  - 1. Pre-qualified contractors meeting ALL requirements set forth within specifications.
  - 2. Substitutions will be allowed or approved only per contract document requirements and Section 01 6000 Product Requirements.
- C. Pre-Pour Installation Conference: Conduct conference at project site to comply with requirements in Division 1 Sections "Special Conditions" and "Administrative Requirements".
- D. Provide project names, addresses, contact names, phone numbers, of at least three (3) projects of similar scope and size completed by the installer.
- E. Manufacturer's Certification: Provide letter of certification stating that the installer is a certified applicator and is familiar with proper procedures and installation requirements recommended by the manufacturer.

## F. Mock-ups:

- 1. Mock-ups to be approximately 100 square feet per color and finish in location indicated or if not indicated, as directed by the Government.
- 2. Install mock-ups to verify selections made under sample submittal and to demonstrate methods and workmanship proposed for the project.
- 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.

- G. Protection: General Contractor shall protect areas to receive polished concrete 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.

#### H. 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. Application of finish system shall take place a minimum of 21 days prior to fixture and trim installation and/or substantial completion.
- 3. Finished concrete area shall be closed to traffic during finish floor application and after application, for the time as recommended by manufacturer.

## **PART 2 – PRODUCTS**

## 2.01 POLISHING 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. For example: HTC 950RX, HTC 800HD, SASE PDG 8000, Husqvarna PG820. No substitutes allowed.

- C. HTC/Pullman Dust extraction system, pre-separator, and squeegee attachments with minimum flow rating of 322 cubic feet per minute such as the HTC 75D, HTC 86D, T8600, T12600, Bull 500, Bull 1250 & T55 or C5500. No substitutes allowed.
- D. Grinding Tools
  - 1. Metal bonded diamonds 16, 25, 40, 80, and 150 grits
  - 2. Resin bonded diamonds 100, 200, 400, 800 and 1500 grits
- E. Grinding Pads for Edges
  - 1. 30, 60 and 120 grits
  - 2. 100, 200, 400 and 800 grits
- F. Hand Grinder with dust extraction attachment and pads.
- G. Densifier: A concrete hardener chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; colorless which hardens and densifies concrete surfaces to protect against abrasion, dusting, and absorption of liquids.
  - 1. Consolideck LS; Lithium Silicate; PROSOCO
  - 2. Ultrasil Li; Lithium Silicate; The Euclid Chemical Company
  - 3. Scofield Formula One Lithium Densifier; L.M. Scofield Company
  - 4. LionHard; Lithium Silicate; L & M Construction Chemicals
  - 5. No substitutions allowed.
- H. Control Joint and Sawcut Filler, two part polyurea.
  - 1. Spal-Pro RS 88 Semi-Rigid Polyurea Joint Filler; Metzger-McGuire
  - 2. Hi-Tech Polyurea PE-85; Hi-Tech Systems
  - 3. Euco QwikJoint 200, The Euclid Chemical Company
  - 4. No substitutions allowed.
- I. Dye: A penetrating dye that chemically combines with cured concrete to produce permanent, variegated or translucent color effects. Available in water-based or solventbased formulas.
  - 1. Consolideck GemTone Stain; PROSOCO

- 2. Ameripolish Dye; American Decorative Concrete
- 3. Scofield Formula One Liquid Dye Concentrate; L.M. Scofield Company
- 4. No substitutions allowed.
- J. Stain Guard: Protect from debris and contaminants.
  - Consolideck LSGuard; PROSOCO
  - 2. UltraGuard; The Euclid Chemical Company
  - 3. Scofield Formula One Guard-W; L.M. Scofield Company
  - 4. Petrotex; L & M Construction Chemicals
  - 5. No substitutions allowed.
- K. Diamond Impregnated Cleaning Pads
  - 1. Consolideck Heat Pad; PROSOCO, Inc.
  - 2. Magic Polishing Pad; SASE Company
  - 3. Twister Polishing Pad;

## **PART 3 – EXECUTION**

## 3.01 PREPARATION

- A. Installer shall examine and approve concrete substrate for conditions affecting performance of finish. General Contractor shall correct conditions that are found to be out of compliance with the requirements of this section. Repairs are not acceptable unless specifically approved on a case-by-case basis by the Government.
- B. Verify that base slab meets finish and surface profile requirements listed in Division 3, Section "Building Concrete Work".
- 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.
- F. Ensure floor cured to accept polishing application.

#### 3.02 POLISHED CONCRETE 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 manufacturers instructions colored to match (or contrast) with concrete color as specified by the Government. All control joint and decorative sawcut filling must be performed prior to grinding application.
- C. Grind the concrete floor to within 2-3 inches of walls with 16, 25, 40 and 80 grit removing construction debris, floor slab imperfections and until there is a uniform scratch pattern and desired concrete aggregate exposure is achieved. Vacuum the floor thoroughly using a squeegee vacuum attachment. Utilize the least aggressive diamond tooling necessary to remove all debris and to achieve uniform scratch pattern.
- D. Grind the edges with 30, 60, and 120 grit grinding pads, prior to grinding the floor with each step on the larger diamond grinder, removing all of the scratches from the previous grit. Vacuum the floor thoroughly after each grind using a squeegee vacuum attachment.
- E. Grind the floor to within 2-3 inches of walls with metal bonded diamond grits of 150 and/or 300, grinding 90 degrees from each previous grind and removing all the scratches from the previous grit. Vacuum the floor thoroughly after each grind using a squeegee vacuum attachment.
- F. Polish the floor with resin bonded diamond grits of 100, 200, 400, first polishing the edges (if specified) with pads of the same grit and then the field of the floor, removing all scratches from the previous grit. After each polish, clean the floor thoroughly using a vacuum with a squeegee attachment. After the 400 grit polishing step thoroughly clean the floor with a mop or auto-scrubber to prepare for dye (if specified).
- G. (If specified) Apply dye color per manufacturer's recommendations. Apply two (2) coats of dye to achieve desired coloration.
- H. Apply densifying impregnator undiluted as per manufacturer's specifications and guidelines. Cover the entire work area liberally and allow to sit for ten (10) minutes. Apply again to areas where the densifying impregnator has soaked in and allow to sit for an additional thirty (30) minutes. Squeegee excess material off the floor.
- I. Polish the floor with resin bonded diamond grit of 800, first polishing the edges (if specified) with pads of the same grit and then the field of the floor, removing all

- scratches from the previous grit. After polishing, clean the floor thoroughly using clean water and an auto scrubber or a mop and a wet vacuum.
- J. Apply stain guard with a micro-fiber applicator and burnish with a fine 800 grit, or very fine 1500 grit diamond impregnated cleaning pad.
- K. Upon completion, the work shall be ready for final inspection and acceptance by the customer.

## PART 4 – SCHEDULES

## **4.01 SHEEN**

- A. Polished Concrete Level 2 1500 grit (Medium Gloss Finish):
  - 1. At a distance of 30 to 50 feet the floor will reveal moderate reflection.
    - a. Yield a 40 to 60 degree sheen, as measured by a Horiba IG-310

## END OF SECTION 03 3680

This page intentionally left blank

November 1, 2024

#### SECTION 04 2000 - UNIT MASONRY

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Concrete Block.
- B. Concrete facing brick.
- C. Clay Facing Brick.
- D. Mortar and Grout. Provide new masonry joints to match existing and point up existing masonry joints as required for fully restored brick.
- E. Reinforcement and Anchorage.
- F. Flashings.
- G. Lintels.
- H. Accessories.

## 1.02 RELATED REQUIREMENTS

- A. Section 04 7200 Cast Stone Masonry
- B. Section 05 5000 Metal Fabrications: Loose steel lintels.
- C. Section 06 1000 Rough Carpentry: Nailing strips built into masonry.
- D. Section 07 1113 Bituminous Dampproofing: Dampproofing parged masonry surfaces.
- E. Section 07 2100 Thermal Insulation: Insulation for cavity spaces.
- F. Section 07 8401 Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
- G. Section 07 6200 SHEET METAL FLASHING AND TRIM: Through-wall masonry flashings.
- H. Section 07 9200 Joint Sealants: Sealing control and expansion joints.
- I. Section 07 6500 Wall Flashing

#### 1.03 REFERENCE STANDARDS

- A. TMS 402/602 Building Code Requirements and Specification for Masonry Structures; 2016.
- B. ACI 530.1/ASCE 6/TMS 602 Specification For Masonry Structures; American Concrete Institute International; 2008.
- C. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- D. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
- E. ASTM A951/A951M Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2016.
- F. ASTM A1064/A1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
- G. ASTM C62 Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale); 2013.
- H. ASTM C67 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2014.
- I. ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units; 2014.
- J. ASTM C91/C91M Standard Specification for Masonry Cement; 2012.
- K. ASTM C129 Standard Specification for Nonloadbearing Concrete Masonry Units; 2011.
- L. ASTM C140/C140M Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.
- M. ASTM C150/C150M Standard Specification for Portland Cement; 2016.
- N. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
- O. ASTM C216 Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2014.
- P. ASTM C270 Standard Specification for Mortar for Unit Masonry; 2014a.
- Q. ASTM C404 Standard Specification for Aggregates for Masonry Grout; 2011.

- R. ASTM C476 Standard Specification for Grout for Masonry; 2010.
- S. ASTM C744 Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units; 2014.
- T. ASTM C780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.
- U. ASTM C979/C979M Standard Specification for Pigments for Integrally Colored Concrete; 2010.
- V. BIA Technical Notes No. 13 Ceramic Glazed Brick Exterior Walls; 2017.

# 1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

#### 1.05 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Samples: Submit four samples of decorative block, face brick, and face brick units to illustrate color, texture, and extremes of color range.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 Product Requirements, for additional provisions.

#### 1.06 MOCK-UP

- A. Construct a masonry wall as a mock-up panel sized and as indicated on drawings; include mortar and accessories, structural backup, wall openings, flashings, and wall insulation in mock-up, and other materials. Provide repurposed masonry samples as required and approved by architect.
- B. Mock-up may remain as part of the Work. **Provide mock-up at a window sill and head conditioin on Readiness Center building.** Utilize all specified components. Architect to give written approval prior to proceeding with work.

# 1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

#### PART 2 PRODUCTS

## 2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
  - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depths as indicated on drawings for specific locations.
  - 2. Grade in Special Shapes: Provide non-standard blocks configured for corners.
  - 3. Load-Bearing Units: ASTM C90, normal weight.
    - a. Hollow block, as indicated.
    - b. Exposed Faces: Manufacturer's standard color and texture where indicated.
  - 4. Non-Loadbearing Units: ASTM C129.
    - a. Hollow block.
    - Exposed Split Face Units: Blocks equal to Block USA Split faced block.
       Color and texture to be selected by Owner and Architect from Manufacturer's full range of standard color and textures.
    - c. 'Echelon' shall be an approved manufacturer of non-load bearing, exposed split face masonry units. Color and texture shall be selected by Owner and Architect from Manufacturer's full standard range.
  - 5. Bullnosed CMU: Provide radiused edge exposed CMU at outside vertical corners, all except first course above finished floor and course at ceiling/all intersection, provide square outside corner edge.

### 2.02 BRICK UNITS

## A. Manufacturers:

- 1. Taylor Clay Brick Products, Inc. Color: #319 Gray. Texture: Wirecut
- 2. Cherokee Brick & Tile Co. Color: M/S Velour Light Gray
- 3. Substitutions: See Section 01 6000 Product Requirements

- B. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
  - 1. Color and texture to match Architect's sample.
  - 2. Nominal size: As indicated on drawings.
  - 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

## 2.03 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Grout Aggregate: ASTM C404.
- D. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
  - 1. Color(s): Color to be selected by Architect from manufacturer's full range of colors as required to match architects sample.

### 2.04 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
  - 1. Hohmann & Barnard, Inc: www.h-b.com.
  - 2. WIRE-BOND: www.wirebond.com/#sle.
  - 3. Substitutions: See Section 01 6000 Product Requirements.
- B. Reinforcing Steel: ASTM A615/A615M Grade 60 (420) deformed billet bars.
- C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated. Size to provide not more than 1 inch (25 mm) and not less than 1/2 inch of mortar coverage from masonry face. Hot dipped galvanized.
- D. Single Wythe Joint Reinforcement: ASTM A951/A951M.
  - 1. Type: Truss or ladder. 16" on center vertically.
  - 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.

- 3. Size: 0.1875 inch (4.8 mm) side rods with 0.1875 inch (4.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.
- 4. Equal to Hohmann & Barnard 120 Truss/220 Ladder
- E. Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
  - 1. Type: Truss.
  - 2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to 16 CFR 1201 Class B.
  - 3. Size: 0.1875 inch (4.8 mm) side rods with 0.1875 inch (4.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.
- F. Adjustable Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
  - 1. Type: Truss, with adjustable ties or tabs spaced at 16 in (406 mm) on center vertically and with adjustable eyelets and pentel veneer ties equal to 2xhook-16" o.c. horizontally.
  - 2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M Class B.
  - 3. Size: 0.1875 inch (4.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods and adjustable components of 0.1875 inch (4.8 mm)wire, width of components as required to provide not less than 5/8 inch (16 mm) of mortar coverage from each masonry face.
  - 4. Vertical adjustment: Not more than 1 1/4 inches (32 mm).
  - 5. Equal to Hohmann and Barnard 170 Truss/270 Ladder with 2x hook.
- G. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch (25 mm) and not less than 1/2 inch (13 mm) of mortar coverage from masonry face.
  - 1. Concrete frame: Dovetail anchors of bent steel strap, nominal 1 inch (25 mm) width x 0.024 in (0.61 mm) thick, with trapezoidal wire ties 0.1875 inch (4.75 mm) thick, hot dip galvanized to ASTM A 153/A 153M, Class B. Equal to Hohmann and Barnard 315 Flexible dove tail tie.
  - 2. Steel frame: Crimped wire anchors for welding to frame, 0.25 inch (6.3 mm) thick, with trapezoidal wire ties 0.1875 inch (4.75 mm) thick, hot dip galvanized to

ASTM A 153/A 153M, Class B. Equal to Hohmann and Barnard 359 Weldon tie with Vee Bna-Tie

- H. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
  - 1. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
  - 2. Vertical adjustment: Not less than 1-1/4 inches (32 mm).
  - 3. For metal stud wall backup: As required for project conditions as recommended by manufacturer.
  - 4. Provide screw pullout hold load per manufacturers requirement for back-up material. Note pullout information on submittal.
  - 5. Equal to Hohmann and Barnard 2 Seal-Tie with 2 seal wire tie.

#### 2.05 FLASHINGS

A. Thru Wall Flashing - Refer to Division 07.

## 2.06 ACCESSORIES

- A. Preformed Control Joints: Polyvinyl chloride material. Provide with corner and tee accessories, fused joints.
  - 1. Manufacturers:
    - a. Dur-O-Wal: www.dur-o-wal.com.
    - b. Hohmann & Barnard, Inc; \_\_\_\_\_: www.h-b.com/#sle.
    - c. WIRE-BOND: www.wirebond.com/#sle.
    - d. Substitutions: See Section 01 6000 Product Requirements.
- B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; maximum lengths available.
- C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
  - 1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.

- a. Manufacturers:
  - 1) Advanced Building Products Inc; Mortar Break: www.advancedflashing.com/#sle.
  - 2) Mortar Net Solutions; \_\_\_\_\_: www.mortarnet.com/#sle.
  - 3) Substitutions: See Section 01 6000 Product Requirements.

# D. Weeps:

- 1. Manufacturers:
  - a. Hohmann & Barnard, Inc; Basis of Design Quadro-Vent: www.h-b.com/#sle.
  - b. Mortar Net Solutions; \_\_\_\_\_: www.mortarnet.com.
  - c. Substitutions: See Section 01 6000 Product Requirements.
- 2. This is to be used at stone as well; adust size to accommodate stone. Color to be selected from manufacturer's full range. ASTM D 2240 Polyproylene
- E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
  - 1. Diedrick technologies or equal.
- F. Where horizontal reinforcement is specified, provide prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.
- G. Stainless Steel Termination Bar install continuous termination bar refer to Section 07 6500.

#### 2.07 MORTAR AND GROUT MIXES

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
  - 1. Masonry below grade and in contact with earth: Type S.
  - 2. Exterior, loadbearing masonry: Type S.
  - 3. Exterior, non-loadbearing masonry: Type S.
  - 4. Interior, loadbearing masonry: Type S.
- B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement

ratio.

- C. Grout: ASTM C476. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm). Provide 28 day compressive strength indicated on drawings.
- D. Mixing: Use mechanical batch mixer and comply with referenced standards.

## PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

### 3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

## 3.03 COLD AND HOT WEATHER REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

# 3.04 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
  - 1. Bond: Running.

- 2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).
- 3. Mortar Joints: Concave.

#### D. Brick Units:

- 1. Bond: As indicated for different locations. Flemish bond unless noted otherwise.
- 2. Coursing: Three units and three mortar joints to equal 8 inches (200 mm).
- 3. Mortar Joints: Concave.
- 4. At existing Admin Building: Match existing bond patter, coursing, and mortar joints.

# 3.05 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar and mortar smears as work progresses.
- E. Interlock intersections and external corners, except for units laid in stack bond.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

# 3.06 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches (600 mm) on center horizontally above through-wall flashing, above shelf angles and lintels, at bottom of walls, and at top of walls for ventilation.

#### 3.07 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
- C. Install cavity mortar control panels continuously throughout exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions. Verify that airspace width is no more than 3/8 inch (9 mm) greater than panel thickness. Install horizontally between joint reinforcement. Stagger end joints in adjacent rows. Fit to perimeter construction and penetrations without voids.
- D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

# 3.08 REINFORCEMENT AND ANCHORAGE - GENERAL

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches (400 mm) on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.
- C. Lap joint reinforcement ends minimum 6 inches (150 mm).
- D. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches (900 mm) horizontally and 24 inches (600 mm) vertically.
- E. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

#### 3.09 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

- A. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.
- B. Lap joint reinforcement ends minimum 6 inches (150 mm).

#### 3.10 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Install horizontal joint reinforcement 16 inches (400 mm) on center.

- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.
- C. Lap joint reinforcement ends minimum 6 inches (150 mm).
- D. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches (400 mm) on center vertically and 16 inches (400 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 16 inches (400 mm) on center.

# 3.11 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY

- A. Install horizontal joint reinforcement 16 inches (400 mm) on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.
- C. Lap joint reinforcement ends minimum 6 inches (150 mm).
- D. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Space anchors at maximum of 16 inches (400 mm) horizontally and 16 inches (400 mm) vertically.

# 3.12 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
- B. Refer to Division 7 for flashing requirements.

# 3.13 LINTELS

- A. Install loose steel lintels over openings of size required for loading if not specified otherwise.
- B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

# 3.14 GROUTED COMPONENTS

- A. Reinforce bond beams with 2 scheduled bars, 1 inch (25 mm) from bottom web.
- B. Lap splices minimum 24 bar diameters.
- C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.

- D. Place and consolidate grout fill without displacing reinforcing.
- E. At bearing locations, fill masonry cores with grout for a minimum 12 inches (300 mm) either side of opening.

# 3.15 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control or expansion joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

## 3.16 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
  - 1. Fill adjacent masonry cores with grout minimum 12 inches (300 mm) from framed openings, unless noted otherwise.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

#### 3.17 TOLERANCES

- A. Maximum Variation from Alignment of Columns: 1/4 inch (6 mm).
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft (6 mm/3 m) and 1/2 inch in 20 ft (13 mm/6 m) or more.
- D. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm/m) and 1/4 inch in 10 ft (6 mm/3 m); 1/2 inch in 30 ft (13 mm/9 m).
- F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch (6 mm).

#### 3.18 CUTTING AND FITTING

- A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

# 3.19 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 Quality Requirements.
- B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67 requirements, sampling 5 randomly chosen units for each 50,000 installed.
- C. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for conformance to requirements of this specification.
- D. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

#### 3.20 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

# 3.21 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

# **END OF SECTION 04 2000**

#### SECTION 04 7200 - CAST STONE MASONRY

# PART 1 GENERAL

# 1.01 SECTION INCLUDES

A. Architectural cast stone.

# 1.02 RELATED REQUIREMENTS

- A. Section 04 2000 Unit Masonry: Installation of cast stone in conjunction with masonry.
- B. Section 07 9005 Joint Sealers: Materials and execution methods for sealing soft joints in cast stone work.
- C. Section 07 6500 Wall Flashing

# 1.03 REFERENCE STANDARDS

- A. ACI 318 Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2016).
- B. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- C. ASTM A185/A185M Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.
- D. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
- E. ASTM A767/A767M Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2009 (Reapproved 2015).
- F. ASTM A884/A884M Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2014.
- G. ASTM A1064/A1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
- H. ASTM C33/C33M Standard Specification for Concrete Aggregates; 2016.
- I. ASTM C150/C150M Standard Specification for Portland Cement; 2016.
- J. ASTM C270 Standard Specification for Mortar for Unit Masonry; 2014a.

- K. ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete; 2016.
- L. ASTM C642 Standard Test Method for Density, Absorption, and Voids in Hardened Concrete; 2013.
- M. ASTM C979/C979M Standard Specification for Pigments for Integrally Colored Concrete; 2010.
- N. ASTM C1364 Standard Specification for Architectural Cast Stone; 2016.

# 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Manufacturer's Qualification Data: Documentation showing compliance with specified requirements.
- C. Product Data: Test results of cast stone components made previously by the manufacturer.
  - 1. Include one copy of ASTM C1364 for Architect's use.
- D. Shop Drawings: Include elevations, dimensions, layouts, profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, and piece numbers.
  - 1. Provide Alabama licensed engineer's stamp on drawings.
  - 2. Reuse of Architect's drawings for shop drawings in not allowed.
- E. Mortar Color Selection Samples.
- F. Verification Samples: Pieces of actual cast stone components not less than 12 inches (305 mm) square, illustrating range of color and texture to be anticipated in components furnished for the project.
  - 1. Prior to ordering materials, the Contractor shall receive written approval of color selection from the Owner and Architect.

# 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm with a minimum of 5 years of experience in producing cast stone of the types required for project.
  - 1. Adequate plant capacity to furnish quality, sizes, and quantity of cast stone required without delaying progress of the work.

2. Products previously produced by plant and exposed to weather that exhibit satisfactory appearance.

# 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration. Protect corners from damage.
- B. Number each piece individually to match shop drawings and schedule.
- C. Store cast stone components and installation materials in accordance with manufacturer's instructions.
- D. Store cast stone components on pallets with nonstaining, waterproof covers. Ventilate under covers to prevent condensation. Prevent contact with dirt.
- E. Protect cast stone components during handling and installation to prevent chipping, cracking, or other damage.
- F. Store mortar materials where contamination can be avoided.
- G. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the work.

# **PART 2 PRODUCTS**

## 2.01 ARCHITECTURAL CAST STONE

- A. Cast Stone: Architectural concrete product manufactured to simulate appearance of natural stone, complying with ASTM C1364.
  - 1. Compressive Strength: As specified in ASTM C1364; calculate strength of pieces to be field cut at 80 percent of uncut piece.
  - 2. Freeze-Thaw Resistance: Demonstrated by field experience.
  - 3. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 20 feet (6 meters).
  - 4. Color: Selected by Owner and Architect from manufacturer's full range.
  - 5. Remove cement film from exposed surfaces before packaging for shipment.
- B. Shapes: Provide shapes indicated on drawings.
  - 1. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch (3 mm) or length divided by 360, whichever is greater, but not

more than 1/4 inch (6 mm).

- 2. Unless otherwise indicated on drawings, provide:
  - a. Wash or slope of 1:12 on exterior horizontal surfaces.
  - b. Drips on projecting components, wherever possible.
  - c. Raised fillets at back of sills and at ends to be built in.
- C. Reinforcement: Provide reinforcement as required to withstand handling and structural stresses; comply with ACI 318. Provide design for connections to structure.
- D. Refer to drawings for Cast Stone Schedule and additional information.

# 2.02 MATERIALS

- A. Portland Cement: ASTM C150/C150M.
  - 1. For Units: Type I, white or gray as required to match Owner and Architect 's sample.
  - 2. For Mortar: Type I or II, except Type III may be used in cold weather.
- B. Coarse Aggregate: ASTM C33/C33M, except for gradation; granite, quartz, or limestone.
- C. Fine Aggregate: ASTM C33/C33M, except for gradation; natural or manufactured sands.
- D. Pigments: ASTM C979, inorganic iron oxides; do not use carbon black.
- E. Admixtures: ASTM C494/C494M.
- F. Water: Potable.
- G. Reinforcing Bars: ASTM A615/A615M deformed bars, galvanized.
  - 1. Galvanized in accordance with ASTM A767/A767M, Class I.
- H. Steel Welded Wire Reinforcement: ASTM A1064/A1064M, galvanized or ASTM A884/A884M, epoxy coated.
- I. Embedded Anchors, Dowels, and Inserts: standard building stone anchors commercially available in a non-corrosive materials such as zinc plated galvanized steel brass or stainless steel Type 302 or 304., of type and size as required for conditions.

- J. Provide Reinforcement and Anchorage as called for in Unit Masonry 04 2000 and structural drawings for horizontal joint reinforcement back to support walls.
- K. Shelf Angles and Similar Structural Items: Hot-dip galvanized steel per ASTM A123/A123M, of shapes and sizes as required for conditions.
- L. Mortar: Portland cement-lime, ASTM C 270 Type N; do not use masonry cement.
- M. Sealant: As specified in Section 07 9005.
- N. Cleaner: General-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces; approved for intended use by cast stone manufacturer and by cleaner manufacturer for use on cast stone and adjacent masonry materials.

#### PART 3 EXECUTION

# 3.01 EXAMINATION

- A. Examine construction to receive cast stone components. Notify Architect if construction is not acceptable.
- B. Do not begin installation until unacceptable conditions have been corrected.

# 3.02 INSTALLATION

- A. Install cast stone components in conjunction with masonry, complying with requirements of Section 04 2000.
- B. Mechanically anchor cast stone units indicated; set remainder in mortar.
- C. Setting:
  - 1. Drench cast stone components with clear, running water immediately before installation.
  - 2. Set units in a full bed of mortar unless otherwise indicated.
  - 3. Fill vertical joints with mortar.
  - 4. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

# 3.03 CLEANING

A. Clean completed exposed cast stone after mortar is thoroughly set and cured.

- 1. Wet surfaces with water before applying cleaner.
- 2. Apply cleaner to cast stone in accordance with manufacturer's instructions.
- 3. Remove cleaner promptly by rinsing thoroughly with clear water.
- 4. Do not use acidic cleaners.

# 3.04 PROTECTION

- A. Protect completed work from damage.
- B. Clean, repair, or restore damaged or mortar-splashed work to condition of new work.
- C. Protect from soil stains during construction.

# **END OF SECTION 04 7200**

#### SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

# **PART 1 - GENERAL**

#### 1.01 SUMMARY

#### A. Section Includes:

- 1. Structural-steel materials.
- 2. Shrinkage-resistant grout.
- 3. Prefabricated building columns.

# B. Related Requirements:

- 1. Section 05 12 13 "Architecturally Exposed Structural Steel Framing" for additional requirements for architecturally exposed structural steel.
- 2. Section 05 50 00 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame, miscellaneous steel fabrications and other steel items not defined as structural steel.
- 3. Section 09 91 13 "Exterior Painting" and Section 099123 "Interior Painting" and Section 09 96 00 "High-Performance Coatings" for painting requirements.
- 4. Section 13 34 19 "Metal Building Systems" for structural steel.

#### 1.02 **DEFINITIONS**

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

# 1.03 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

#### 1.04 ACTION SUBMITTALS

# A. Product Data:

- 1. Structural-steel materials.
- 2. High-strength, bolt-nut-washer assemblies.
- 3. Shear stud connectors.
- 4. Anchor rods.
- 5. Threaded rods.
- 6. Forged-steel hardware.
- 7. Slide bearings.
- 8. Prefabricated building columns.

- 9. Shop primer.
- 10. Galvanized-steel primer.
- 11. Etching cleaner.
- 12. Galvanized repair paint.
- 13. Shrinkage-resistant grout.
- B. Shop Drawings: Show fabrication of structural-steel components.
  - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
  - 2. Include embedment Drawings.
  - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
  - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
- C. Delegated Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

# 1.05 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural-steel materials, including chemical and physical properties.
- E. Product Test Reports: For the following:
  - 1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
  - 2. Direct-tension indicators.
  - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
  - 4. Shear stud connectors.
  - 5. Nonshrink grout.
- F. Survey of existing conditions.
- G. Source quality-control reports.
- H. Field quality-control reports.

# 1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).
- B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category ACSE.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.
  - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds are to pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G are to be considered separate processes for welding personnel qualification.

# 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
  - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
  - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
  - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
  - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

# **PART 2 - PRODUCTS**

# 2.01 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
  - 1. ANSI/AISC 303.
  - 2. ANSI/AISC 341.
  - 3. ANSI/AISC 360.
  - 4. RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- B. Connection Design Information:

- 1. Fabricator's experienced steel detailer selects or completes connections in accordance with ANSI/AISC 303.
  - a. Select and complete connections using schematic details indicated ANSI/AISC 360.
  - b. Use Load and Resistance Factor Design; data are given at factored-load level.
- 2. Option 2 and 2A: Design connections in accordance with ANSI/AISC 303 by fabricator's qualified professional engineer. Member reinforcement at connections is indicated on Drawings.
  - a. Use Load and Resistance Factor Design; data are given at factored-load level.
- C. Moment Connections: Type FR, fully restrained.
- D. Construction: Combined system of moment frame and shear walls.

### 2.02 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M
- B. Channels, Angles: ASTM A36/A36M
- C. Plate and Bar: ASTM A36/A36M
- D. Corrosion-Resisting (Weathering) Structural-Steel Shapes, Plates, and Bars: ASTM A588/A588M, 50 ksi.
- E. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing.
- F. Corrosion-Resisting (Weathering), Cold-Formed Hollow Structural Sections: ASTM A847/A847M structural tubing.
- G. Steel Castings: ASTM A216/A216M, Grade WCB, with supplementary requirement S11.
- H. Welding Electrodes: Comply with AWS requirements.

# 2.03 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
  - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.

- B. High-Strength A490 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A490, Type 1, heavy-hex steel structural bolts or Grade F2280 tension-control, bolt-nut-washer assemblies with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
  - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 490-1, compressible-washer type with plain finish.
- C. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

# 2.04 **RODS**

- A. Unheaded Anchor Rods: ASTM F1554, Grade 55, weldable
  - 1. Configuration: Straight
  - 2. Nuts: ASTM A563 heavy-]hex carbon steel.
  - 3. Plate Washers: ASTM A36/A36M carbon steel.
  - 4. Washers: ASTM F436, Type 1, hardened carbon steel.
  - 5. Finish: Plain
- B. Headed Anchor Rods: **ASTM F1554, Grade 36**straight.
  - 1. Nuts: ASTM A563 heavy-]hex carbon steel.
  - 2. Plate Washers: ASTM A36/A36M carbon steel.
  - 3. Washers: ASTM F436 Type 1, hardened carbon steel.
  - 4. Finish: Plain
- C. Threaded Rods: ASTM A36/A36M
  - 1. Nuts: ASTM A63 heavy-hex carbon steel.
  - 2. Washers: ASTM F436, Type 1, hardened carbon steel.
  - 3. Finish: Plain.

# 2.05 PRIMER

- A. Steel Primer:
  - Comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
  - 2. SSPC-Paint 23, latex primer.
  - 3. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
  - 4. Galvanizing Repair Paint: ASTM A780.

# 2.06 SHRINKAGE-RESISTANT GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.07 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
  - 1. Camber structural-steel members where indicated.
  - 2. Fabricate beams with rolling camber up.
  - 3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
  - 4. Mark and match-mark materials for field assembly.
  - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
  - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 2 or SSPC-SP 3.
- F. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural-steel frame. Straighten as required to provide uniform, square, and true members in completed wall framing. Build up welded framing, weld exposed joints continuously, and grind smooth.
- H. Welded-Steel Door Frames: Build up welded-steel doorframes attached to structural-steel frame. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk machine screws, uniformly spaced not more than 10 inches o.c. unless otherwise indicated on Drawings.
- I. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
  - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
  - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

#### 2.08 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

# 2.09 PREFABRICATED BUILDING COLUMNS

- A. Prefabricated building columns, consisting of load-bearing structural-steel members protected by concrete fireproofing encased in an outer non-load-bearing steel shell.
- B. Fire-Resistance Ratings: Provide prefabricated building column listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for ratings indicated, based on testing in accordance with ASTM E119.
  - 1. Fire-Resistance Design: UL Design No. indicated on drawings.
  - 2. Fire-Resistance Rating: As indicated on Drawings.

#### 2.10 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
  - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
  - 2. Galvanize lintels, shelf angles, and welded door frames attached to structural-steel frame and located in exterior walls.

# 2.11 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
  - 1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
  - 2. Bolted Connections: Inspect shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
  - 3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - a. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
    - b. Ultrasonic Inspection: ASTM E164.

4. Prepare test and inspection reports.

### **PART 3 - EXECUTION**

#### 3.01 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
  - 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.02 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.

#### 3.03 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.

- 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

# 3.04 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
  - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  - 2. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.
- C. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.

# 3.05 INSTALLATION OF PREFABRICATED BUILDING COLUMNS

A. Install prefabricated building columns to comply with ANSI/AISC 360, manufacturer's written recommendations, and requirements of testing and inspecting agency that apply to the fire-resistance rating indicated.

# 3.06 REPAIR

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.
- B. Touchup Painting:
  - 1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
    - a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

C. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

# 3.07 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:
  - 1. Verify structural-steel materials and inspect steel frame joint details.
  - 2. Verify weld materials and inspect welds.
  - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
  - 1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
  - 2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
    - a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
      - 1) Liquid Penetrant Inspection: ASTM E165/E165M.
      - 2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
      - 3) Ultrasonic Inspection: ASTM E164.
      - 4) Radiographic Inspection: ASTM E94/E94M.
  - 3. Shear Stud Connectors: In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
    - a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
    - b. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

## **END OF SECTION**

#### SECTION 05 31 00 - STEEL DECKING

# **PART 1 - GENERAL**

#### 1.01 SUMMARY

- A. Section Includes:
  - 1. Roof deck.
- B. Related Requirements:
  - 1. Section 05 12 00 "Structural Steel Framing" for shop- and field-welded shear connectors.
  - 2. Section 05 50 00 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.

# 1.02 ACTION SUBMITTALS

- A. Product Data:
  - 1. Roof deck.
- B. Shop Drawings:
  - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

# 1.03 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.
- C. Test and Evaluation Reports:
  - 1. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
    - a. Power-actuated mechanical fasteners.
  - 2. Research Reports: For steel deck, from ICC-ES showing compliance with the building code.
- D. Field Quality-Control Submittals:
  - 1. Field quality-control reports.
- E. Qualification Statements: For welding personnel and testing agency.

# 1.04 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and the following welding codes:

- 1. AWS D1.1/D1.1M.
- 2. AWS D1.3/D1.3M.
- B. Electrical Raceway Units: Provide UL-labeled cellular floor-deck units complying with UL 209 and listed in UL's "Electrical Construction Equipment Directory" for use with standard header ducts and outlets for electrical distribution systems.

# 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
  - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

## **PART 2 - PRODUCTS**

# 2.01 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI S100.
- B. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Indicate design designations from UL's "Fire Resistance Directory" or from listings of another qualified testing agency.

#### 2.02 ROOF DECK

Retain this article if roof deck is required.

- A. Fabrication of Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:
  - 1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G60 zinc coating.
  - 2. Deck Profile: Type WR, wide rib.
  - 3. Profile Depth: 1-1/2 inches.
  - 4. Design Uncoated-Steel Thickness: 0.0358 inch.
  - 5. Span Condition: Triple span or more.
  - 6. Side Laps: Overlapped.

#### 2.03 ACCESSORIES

A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- F. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.
- G. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- H. Galvanizing Repair Paint: ASTM A780.
- I. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

# **PART 3 - EXECUTION**

#### 3.01 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.02 INSTALLATION, GENERAL

- A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

#### 3.03 INSTALLATION OF ROOF DECK

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter as follows:
  - 1. Weld Diameter: 5/8 inch, nominal.
  - 2. Weld Spacing: Weld edge and interior ribs of deck units as indicated on the drawings.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals indicated on the drawings.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
  - 1. End Joints: Lapped 2 inches minimum.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches apart with at least one fastener at each corner.
  - 1. Install reinforcing channels or zees in ribs to span between supports and mechanically fasten.
- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels in accordance with deck manufacturer's written instructions. Mechanically fasten to substrate to provide a complete deck installation.
  - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive in accordance with manufacturer's written instructions to ensure complete closure.

#### 3.04 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.
- B. Repair Painting:
  - 1. Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.

2. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

# 3.05 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Tests and Inspections:
  - 1. Special inspections and qualification of welding special inspectors for coldformed steel floor and roof deck in accordance with quality-assurance inspection requirements of SDI QA/QC.
    - a. Field welds will be subject to inspection.
  - 2. Steel decking will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

# **END OF SECTION**

#### SECTION 05 44 00 - COLD-FORMED METAL TRUSSES

# **PART 1 - GENERAL**

#### 1.01 SUMMARY

- A. Section Includes:
  - 1. Cold-formed steel roof trusses.
- B. Related Requirements:
  - 1. Section 05 21 00 "Steel Joist Framing" for trusslike, steel floor or roof joists and joist girders.
  - 2. Section 05 40 00 "Cold-Formed Metal Framing" for cold-formed steel studs, joists, and rafters.

# 1.02 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

## 1.03 ACTION SUBMITTALS

- A. Product Data:
  - 1. Cold-formed steel roof trusses.
- B. Product Data Submittals:
  - 1. Cold-formed steel truss materials.
  - 2. Anchor bolts.
  - 3. Post-installed anchors.
  - 4. Power-actuated fasteners.
  - 5. Mechanical fasteners.
- C. Shop Drawings:
  - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel trusses; fabrication; and fastening and anchorage details, including mechanical fasteners.
  - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- D. Delegated Design Submittals: For cold-formed steel trusses.

# 1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.

- C. Product Test Reports: For each listed product, for tests performed by a qualified testing agency.
  - 1. Steel sheet.
  - 2. Expansion anchors.
  - 3. Power-actuated anchors.
  - 4. Mechanical fasteners.
  - 5. Miscellaneous structural clips and accessories.
- D. Research Reports: For power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
- E. Field quality-control reports.

# 1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified in accordance with ASTM E329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code Sheet Steel."

# **PART 2 - PRODUCTS**

# 2.01 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design cold-formed steel trusses.
- B. Structural Performance: Provide cold-formed steel trusses capable of withstanding design loads within limits and under conditions indicated.
  - 1. Design Loads: As indicated on Drawings.
  - 2. Deflection Limits: Design trusses to withstand design loads without deflections greater than the following:
    - a. Roof Trusses: Vertical deflection of 1/240 of the span.
  - 3. Design trusses to provide for movement of truss members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
- C. Cold-Formed Steel Truss Standards: Unless more stringent requirements are indicated, trusses comply with the following:

- 1. Roof Systems: AISI S210.
- 2. Lateral Design: AISI S213.
- 3. Roof Trusses: AISI S214.
- D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Indicate design designations from UL or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.

# 2.02 COLD-FORMED STEEL TRUSS MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
  - 1. Grade: As required by structural performance.
  - 2. Coating: G60.

# 2.03 COLD-FORMED STEEL ROOF TRUSSES

- A. Roof Truss Members: Manufacturer's standard C-shaped steel sections.
  - 1. Connecting Flange Width: 1-5/8 inches, minimum at top and bottom chords connecting to sheathing or other directly fastened construction.
  - 2. Minimum Base-Metal Thickness: 0.0428 inch.

# 2.04 TRUSS ACCESSORIES

- A. Fabricate steel-truss accessories from steel sheet, ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for truss members.
- B. Provide accessories of manufacturer's standard thickness and configuration unless otherwise indicated.

# 2.05 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process in accordance with ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process in accordance with ASTM A153/A153M, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC193, ICC-ES AC58 or ICC-ES AC308 as appropriate for the substrate.
  - 1. Uses: Securing cold-formed steel trusses to structure.

- 2. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
- D. Power-Actuated Fasteners: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
  - 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

# 2.06 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M, MIL-P-21035B, or SSPC-Paint 20.
- B. Shims: Load-bearing, high-density multimonomer, nonleaching plastic; or coldformed steel of same grade and metallic coating as truss members supported by shims.

#### 2.07 FABRICATION OF COLD-FORMED STEEL TRUSSES AND ACCESSORIES

- A. Fabricate cold-formed steel trusses and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
  - 1. Fabricate trusses using jigs or templates.
  - 2. Cut truss members by sawing or shearing; do not torch cut.
  - 3. Fasten cold-formed steel truss members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator.
    - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work
  - 4. Fasten other materials to cold-formed steel trusses by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace trusses to withstand handling, delivery, and erection stresses. Lift fabricated trusses by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:
  - 1. Spacing: Space individual truss members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.
  - 2. Squareness: Fabricate each cold-formed steel truss to a maximum out-of-square tolerance of 1/8 inch.

# **PART 3 - EXECUTION**

# 3.01 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting trusses and framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.02 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed steel trusses without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.

# 3.03 INSTALLATION OF COLD-FORMED STEEL TRUSSES

- A. Install bridge, and brace cold-formed steel trusses in accordance with AISI S200, AISI S202, AISI S214, and manufacturer's written instructions unless more stringent requirements are indicated.
  - 1. Anchor trusses securely at all bearing points.
  - 2. Install continuous bridging and permanently brace trusses as indicated on Shop Drawings and designed according to CFSEI's Technical Note 551e, "Design Guide: Permanent Bracing of Cold-Formed Steel Trusses.".
- B. Install cold-formed steel trusses and accessories true to line and location, and with connections securely fastened.
  - 1. Erect trusses with plane of truss webs plumb and parallel to each other. Align and accurately position trusses at required spacings.
  - 2. Erect trusses without damaging truss members or connections.
  - 3. Fasten cold-formed steel trusses by welding or mechanical fasteners.
    - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
- C. Install temporary bracing and supports to secure trusses and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to trusses are secured.

- D. Truss Spacing: As indicated on Drawings.
- E. Do not alter, cut, or remove truss members or connections of trusses.

# 3.04 ERECTION TOLERANCES

- A. Install cold-formed steel trusses level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
  - 1. Space individual trusses no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

# 3.05 REPAIR

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel trusses with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

# 3.06 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Cold-formed metal trusses will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

# 3.07 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel trusses are without damage or deterioration at time of Substantial Completion.

#### END OF SECTION

## **SECTION 05 5000 - METAL FABRICATIONS**

# PART 1 GENERAL

# 1.01 SECTION INCLUDES

- A. Shop fabricated steel items.
- B. Hot Dipped Galvanized Bollards
- C. Ladder
- D. Round metal (steel) handrails at ramp. See civil drawings.

# 1.02 RELATED REQUIREMENTS

A. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.

## 1.03 REFERENCE STANDARDS

- A. ANSI A14.3 American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.
- B. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2014.
- C. ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- D. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- E. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- F. ASTM A283/A283M Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.
- G. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- H. ASTM A325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- I. ASTM A500/A500M Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

- J. ASTM A501/A501M Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- K. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- L. ASTM A1011/A1011M Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- M. AWS A2.4 Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- N. AWS D1.1/D1.1M Structural Welding Code Steel; 2015.
- O. SSPC-SP 2 Hand Tool Cleaning; 1982 (Ed. 2004).

# 1.04 SUBMITTALS

- A. See Section 01 3300 Submittal Procedures, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

# 1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Welding: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1, "Structural Welding Code--Steel."

#### 1.06 PROJECT CONDITIONS

A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions 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 dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

# 1.07 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. 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.

# PART 2 PRODUCTS

# 2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A 53/A 53M Grade B Schedule 40, black finish.
- E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
- F. Slotted Channel Fittings: ASTM A1011/A1011M.
- G. Wide Flange Sections: ASTM A992
- H. Fasteners:
  - 1. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, and class required.
  - 2. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
  - 3. Anchor Bolts: ASTM F 1554, Grade 36.
  - 4. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

- 5. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- 6. Plain Washers: Round, carbon steel, ASME B18.22.1 (ASME B18.22M).
- 7. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1 (ASME B18.21.2M).
- 8. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
  - a. Material: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
- 9. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as needed.
- I. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

## 2.02 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## 2.03 FABRICATED ITEMS

- A. Hot Dipped Galvanized Ramp Hand Railings
- B. Bollards: Hot Dipped Galvanized Steel pipe, concrete filled, crowned cap, as detailed; hot dipped prime paint finish.
- C. Lintels: As detailed; hot dipped prime paint finish.

#### **2.04 GROUT**

- A. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.
- B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

## 2.05 FINISHES - STEEL

- A. Prepare surfaces to be primed in accordance with SSPC-SP2.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to galvanizing.
- C. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements.
- D. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

## 2.06 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).
- C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).
- D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).
- E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

#### PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

## 3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

## 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Perform field welding in accordance with AWS D1.1/D1.1M.
- D. Obtain approval prior to site cutting or making adjustments not scheduled.
- E. After erection, prime welds, abrasions and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

## 3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
- C. Maximum Out-of-Position: 1/4 inch (6 mm).

## END OF SECTION 05 5000

#### SECTION 06 1000 - ROUGH CARPENTRY

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Concealed blocking for miscellaneous items.
- B. Roof-mounted curbs.
- C. Roofing nailers.
- D. Preservative treated wood materials.
- E. Fire retardant treated wood materials.
- F. Concealed wood blocking, nailers, and supports.

## 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 5000 Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- C. Section 07 2500 Weather Barriers: Air barrier over sheathing.
- D. Section 07 6200 SHEET METAL FLASHING AND TRIM: Sill flashings.
- E. Section 09 2116 Gypsum Board Assemblies: Gypsum-based sheathing.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM D2898 Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.
- D. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- E. AWPA U1 Use Category System: User Specification for Treated Wood; 2012.
- F. PS 1 Structural Plywood; 2009.

- G. PS 20 American Softwood Lumber Standard; 2010.
- H. SPIB (GR) Grading Rules; 2014.

## 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials and application instructions.
- C. Samples: For rough carpentry members that will be exposed to view, submit two samples, \_\_\_\_by\_\_\_ inch (\_\_\_\_by\_\_\_ mm) in size illustrating wood grain, color, and general appearance.

# 1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

## PART 2 PRODUCTS

## 2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
  - 1. Species: Southern Pine, unless otherwise indicated.
  - 2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
  - 3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

#### 2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.

- C. Moisture Content: S-dry or MC19.
- D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
  - 1. Lumber: S4S, No. 2 or Standard Grade.
  - 2. Boards: Standard or No. 3.

## 2.03 EXPOSED DIMENSION LUMBER

- A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- B. Sizes: Nominal sizes as indicated on drawings.
- C. Surfacing: S4S.
- D. Sizes: Nominal sizes as indicated on drawings, S4S.
- E. Moisture Content: S-dry or MC19.

#### 2.04 EXPOSED BOARDS

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Moisture Content: Kiln-dry (15 percent maximum).
- C. Surfacing: S4S.
- D. Species: Douglas Fir.
- E. Grade: No. 2, 2 Common, or Construction.

## 2.05 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch (19 mm) thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

## 2.06 ACCESSORIES

- A. Fasteners and Anchors:
  - Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

## 2.07 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
  - Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
  - 2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in

В.	Fire	Retardant	Treatment

C.

	acc	ordance with AWPA standards.			
Fire	Ret	ardant Treatment:			
1.	Ma	Manufacturers:			
	a.	Lonza Group;: www.wolmanizedwood.com/#sle.			
	b.	Hoover Treated Wood Products, Inc;: www.frtw.com/#sle.			
	c.	Koppers, Inc;: www.koppersperformancechemicals.com/#sle.			
2.	Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.				
	a.	Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.			
	b.	Treat rough carpentry items as indicated.			
	c.	Do not use treated wood in applications exposed to weather or where the wood may become wet.			
Pres	serva	tive Treatment:			
1.	nufacturers:				
	a.	Lonza Group;: www.wolmanizedwood.com/#sle.			
	b.	Viance, LLC; Product: www.treatedwood.com.			
	C	Osmose Inc. www.osmose.com			

- 2. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
  - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
  - b. Treat lumber in contact with roofing, flashing, or waterproofing.
  - c. Treat lumber in contact with masonry or concrete.
  - d. Treat lumber less than 18 inches (450 mm) above grade.
- 3. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
  - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
  - b. Treat plywood in contact with roofing, flashing, or waterproofing.
  - c. Treat plywood in contact with masonry or concrete.
  - d. Treat plywood less than 18 inches (450 mm) above grade.

## **PART 3 EXECUTION**

#### 3.01 PREPARATION

- A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches (100 mm) and seal.
- B. Coordinate installation of rough carpentry members specified in other sections.

#### 3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

## 3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- E. Specifically, provide the following non-structural concealed framing and blocking:
  - 1. Cabinets and shelf supports.
  - 2. Wall brackets.
  - 3. Handrails.
  - 4. Grab bars.
  - 5. Towel and bath accessories.
  - 6. Wall-mounted door stops.
  - 7. Chalkboards and marker boards.
  - 8. Joints of rigid wall coverings that occur between studs.
  - 9. Interior Wall Plaques
  - 10. Acoustical Wall Panels.
  - 11. Audio/Visual Equipment
  - 12. Uniform Storage and Instrument Storage Cabinets.

## 3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

## 3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches (610 mm) on

center on all edges and into studs in field of board.

- 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
- 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
- 3. Install adjacent boards without gaps.
- 4. Size and Location: As indicated on drawings.

#### 3.06 TOLERANCES

- A. Framing Members: 1/4 inch (6 mm) from true position, maximum.
- B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

## 3.07 CLEANING

- A. Waste Disposal: Comply with the requirements of Section 01 7419 Construction Waste Management and Disposal.
  - 1. Comply with applicable regulations.
  - 2. Do not burn scrap on project site.
  - 3. Do not burn scraps that have been pressure treated.
  - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to cogeneration facilities or "waste-to-energy" facilities.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

## END OF SECTION 06 1000

This page intentionally left blank

#### **SECTION 06 2000 - FINISH CARPENTRY**

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Finish carpentry items and misc. wood trim.
- B. Hardware and attachment accessories.
- C. Decorative wood louver.

## 1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

## 1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) Architectural Woodwork Standards; 2014.
- B. AWMAC/WI (NAAWS) North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.

## 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements for submittal procedures.
- B. Shop Drawings: Submit decorative wood louver for approval. Finish wood to be hardwood lumber noted herein.

## 1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect from moisture damage.

## **PART 2 PRODUCTS**

# 2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

#### 2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

#### 2.03 LUMBER MATERIALS

A. Hardwood Lumber: poplar species, maximum moisture content of 6 percent; with vertical grain, of quality suitable for opaque finish.

## 2.04 SHEET MATERIALS (refer to Section 06 1000 Rough Carpentry)

- A. Installation for sheet and panel materials is in this Section 06 2000 and Section 06 1000.
  - Softwood Plywood, Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

#### 2.05 FASTENINGS

- A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
- B. Fasteners: Of size and type to suit application; project finish in concealed locations and project finish in exposed locations.
- C. Concealed Joint Fasteners: Threaded steel.

#### 2.06 ACCESSORIES

A. Wood Filler: Solvent base, tinted to match surface finish color.

# 2.07 HARDWARE - As specified in Section \_\_\_\_\_\_.

A. Hardware: Comply with BHMA A156.9.

## 2.08 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

## PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.
- C. See Section 06 1000 Rough Carpentry for installation of recessed wood blocking.

## 3.02 INSTALLATION

- A. Set and secure materials and components in place, plumb and level.
- B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.
- C. Install hardware in accordance with manufacturer's written instructions.

## 3.03 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch (1.6 mm).
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.79 mm).

#### END OF SECTION 06 2000

This page intentionally left blank

# SECTION 06 4100 - ARCHITECTURAL WOOD CASEWORK

## **PART 1 GENERAL**

## 1.01 SECTION INCLUDES

- A. Specially fabricated plastic laminate cabinet units.
- B. Countertops.
- C. Cabinet hardware and accessories

# 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 1000 Rough Carpentry: Support framing, grounds, and concealed blocking.
- C. Section 09 6500 Resilient Flooring
- D. Section 12 3600 Solid Surface Countertops

## 1.03 REFERENCE STANDARDS

- A. ANSI A208.1 American National Standard for Particleboard; 2009.
- B. ANSI A208.2 American National Standard for Medium Density Fiberboard for Interior Use; 2009.
- C. BHMA A156.9 American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
- D. GSA CID A-A-1936 Adhesive, Contact, Neoprene Rubber; Federal Specifications and Standards; Revision A, 1996.
- E. NEMA LD 3 High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

# 1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

#### 1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
  - 1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot (1:8).
- C. Samples: Submit actual samples of architectural cabinet construction, minimum 24 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate. finish, hardware, etc.
- D. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.
- E. Color Samples for approval.

## 1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum three years of documented experience.
  - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

## 1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

#### 1.08 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

## **PART 2 PRODUCTS**

# 2.01 CABINETS

- A. Plastic Laminate Faced Cabinets: Custom grade.
- B. Cabinets:
  - 1. Finish Exposed Exterior Surfaces: Decorative laminate.
  - 2. Finish Exposed Interior Surfaces: Decorative laminate.
  - 3. Finish Concealed Surfaces: Manufacturer's cabinet liner.
  - 4. Door and Drawer Front Edge Profiles and all Cabinet top edges: 3 mm thick, factory adhered., provide minimum 24 color options.

- 5. Interface Style for Cabinet and Door: Style 1 Overlay; reveal overlay.
- 6. Adjustable Shelf Loading: 50 lbs. per sq. ft..
  - a. Deflection: L/144.
- 7. Cabinet Style: Flush overlay.
- 8. Cabinet Doors and Drawer Fronts: Flush style.
- 9. Drawer Side Construction: Doweled, and/or dovetail construction of 1/2" thick solid birch with clear finish.
- 10. Colors as selected by architect.

## 2.02 WOOD COMPONENTS:

A. All transparent wood trim shall be clear solid birch: all opaque be popular or birch, contractors option, with finish as selected by architect.

#### 2.03 LAMINATE MATERIALS

- A. Manufacturers:
  - 1. Formica Corporation; \_: www.formica.com.
  - 2. Panolam Industries International, Inc; www.nevamar.com.
  - 3. Wilsonart, LLC; : www.wilsonart.com. (BASIS OF DESIGN)
  - 4. Laminart
  - 5. Substitutions: See Section 01 6000 Product Requirements.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
- C. Provide specific types as scheduled.
  - 1. Horizontal Surfaces: Laminate, HGP, 0.035 inch (1.22 mm) nominal thickness, colors as selected from manufacturer's full range of colors.
  - 2. Vertical Surfaces: VGS, 0.028 inch (0.71 mm) nominal thickness, colors as selected from manufacturer's full range of colors.
  - 3. Cabinet Liner: CLS, 0.020 inch (0.51 mm) nominal thickness, through color, colors as selected from manufacturer's full range of colors.

4. Laminate Backer: BKL, 0.020 inch (0.51 mm) nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

#### D. Laminate selections:

1. Plastic Laminate Cabinets: Provide color selection from manufacturer's premium color range. Color selected by owner and architect.

## 2.04 COUNTERTOPS

A. Plastic Laminate Countertops: Medium (45#) density fiberboard substrate covered with HPDL, conventionally fabricated, with decorative 1 5/16 inch high with 3mm thick (typical) edge. Refer to drawings for location.

#### 2.05 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application. Provide 10 year plastic laminate adhesion warranty and meet all environmental regulations.
- B. Plastic Edge Banding: Extruded 3mm PVC, flat shaped; smooth finish; of width to match component thickness.
  - 1. Color: As selected by Architect from manufacturer's standard range. Minimum 24 color selection.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Counter top Grommets: Standard plastic, painted metal, or rubber grommets for cutouts, in color to match adjacent surface. Submit sample for approval.

#### 2.06 HARDWARE

- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.
- C. Drawer and Door Pulls: "U" shaped wire pull, steel with **chrome** finish, 4 inch centers ("U" shaped wire pull, steel with powder caot finish finish, 100 mm centers). Match

**Existing Finish** 

D.	Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chror	ne
	inish.	

#### E. Drawer Slides:

- 1. Type: Full extension, powder coat.
- 2. Static Load Capacity: Commercial grade.
- 3. Mounting: Side mounted.
- 4. Stops: Integral type.
- 5. Features: Provide **soft closing**/stay closed type, heavy duty.
- 6. Products:
  - a. Accuride International, Inc; \_\_\_\_: www.accuride.com.
  - b. Grass America Inc; \_\_\_\_: www.grassusa.com.
  - c. Hettich America, LP; \_\_\_\_: www.hettichamerica.com.
  - d. Knape & Vogt Manufacturing Company; \_\_\_\_: www.knapeandvogt.com.
  - e. Substitutions: See Section 01 6000 Product Requirements.
- F. Hinges: five knuckle self-closing type, BHMA No. \_\_\_\_\_\_, steel with powder coat finish. Match door and drawer pull finish Finish. Each hinge shall be secured witha minimum of nine No. 8 screws. Hinge shall permit door to swing 270 degrees without binding. Doors less than 48" in height shall have two hinges. Doors over 48" in height shall have three hinges.

#### 2.07 SITE FINISHING MATERIALS

A. Finishing of Wood trim: Site finished as specified in Section 09 9000

#### 2.08 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.
  - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
- E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Seal cut edges.
- F. 3mm PVC Edge Banding shall be applied utilizing hot melt adhesive and radiused by automatic trimmers. Edgery shall be available in a variety of color options.

#### 2.09 MANUFACTURERS/PRODUCTS:

- A. Acceptable Products per project contract documents:
  - 1. Case Systems
  - 2. Stevens
  - 3. Alco Enterprises, Inc Montgomery, AL
  - 4. Phipps Cabinets, Inc Dothan, AL
  - 5. Substitutions: See 01 6000 Product Requirements

## **PART 3 EXECUTION**

## 3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

## 3.02 INSTALLATION

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Do not use additional overlay trim for this purpose.

- E. Secure cabinets to floor using appropriate angles and anchorages.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- G. Decorative Resin Panels: Install per manufacturers strict requirements.

## 3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

## 3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

## **END OF SECTION 06 4100**

This page intentionally left blank

#### SECTION 07 1113 - BITUMINOUS DAMPPROOFING

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Bituminous dampproofing.

## 1.02 REFERENCE STANDARDS

- A. ASTM D1187/D1187M Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2018).
- B. ASTM D1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013.

## 1.03 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide properties of primer, bitumen, and mastics.

## PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A.	Bituminous	Ľ	ampproofii	ng	Manufacturers:
----	------------	---	------------	----	----------------

- 1. Karnak Corporation; \_\_\_\_\_: www.karnakcorp.com/#sle.
- 2. Mar-Flex Systems, Inc; \_\_\_\_: www.mar-flex.com/#sle.
- 3. W. R. Meadows, Inc; \_\_\_\_: www.wrmeadows.com/#sle.
- 4. Substitutions: See Section 01 6000 Product Requirements.

## 2.02 BITUMINOUS DAMPPROOFING

- A. Bituminous Dampproofing: Cold-applied water-based emulsion; asphalt with mineral colloid or chemical emulsifying agent; with or without fiber reinforcement; asbestosfree; suitable for application on vertical and horizontal surfaces.
  - Composition Vertical Application: ASTM D1227 Type III or ASTM D1187/D1187M Type I.
  - 2. Composition Horizontal and Low-Slope Application: ASTM D1227 Type II or III.

- 3. VOC Content: Not more than permitted by local, State, and federal regulations.
- 4. Applied Thickness: 1/16 inch (1.5 mm), minimum, wet film.
- 5. Products:
  - a. Basis of Design: W. R. Meadows, Inc; Sealmastic Emulsion Type I (spray-grade): www.wrmeadows.com/#sle.
  - b. Substitutions: See Section 01 6000 Product Requirements.
- B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

## PART 3 EXECUTION

# 3.01 APPLICATION

- A. Apply bitumen by spray application.
- B. Seal items watertight with mastic, that project through dampproofing surface.

# **END OF SECTION 07 1113**

#### SECTION 07 1300 - SHEET WATERPROOFING

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Sheet membrane waterproofing system located at the perimeter foundation shall shown on Detail 4/A5.2. Sheet membrane waterproofing shall extend 36 inches continuous from top, attached by termination bar, to bottom turned out horizonatally on top the footing (36 " is the width of basis of design product). Install in strict accordance to manufacturer's instructions.

## 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 Building Concrete Work: Concrete substrate.
- B. Section 01 6116 Volatile Organic Compound (VOC) Content Restrictions
- C. Section 04 2000 Unit Masonry: Masonry joints prepared to receive flashings.
- D. Section 07 2500 Weather Barriers
- E. Section 07 6500 Wall Flashing
- F. Section 07 9200 Joint Sealants: Sealing moving joints in waterproofed surfaces that are not required to be treated in this section.

#### 1.03 SUBMITTALS

- A. See Section 01 3300 Submittal Procedures, for submittal procedures.
- B. Product Data: Provide data for sheet waterproofing membrane.
- C. Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

# 1.04 QUALITY ASSURANCE

- A. Membrane Manufacturer Qualifications: Company specializing in waterproofing sheet membranes with three years experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience.

#### **1.05 MOCK-UP**

- A. Construct mock-up 100 sq ft (10 sq m) of horizontal waterproofed panel; to represent finished work including internal and external corners.
- B. Locate where directed.
- C. Mock-up may not remain as part of the Work.

## 1.06 FIELD CONDITIONS

A. Apply only in dry weather and at air and surface temperatures of 40 degrees F (5 degrees C) and above.

## 1.07 WARRANTY

- A. See Section 01 7800 Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

## PART 2 PRODUCTS

#### 2.01 MATERIALS

- A. Sheet Membrane Waterproofing System:
- B. Basis of Design: Hohmann Barnard HB Below-Grade 60 woven polyethlene membrane bonded to highly self adhesive bituminous layer protected by release liner. 60 mil heavy duty membrane.
  - 1. Tensile strength: per ASTM D 412, 2027 PSI
  - 2. Elongation: For Asphalt Adhesive, per ASTM 412 C, 1316.9 percent.
  - 3. Puncture resistance: Per ASTM D 570, less that 0,5%.
  - 4. Resistance to Hydrostatic head: Per ASTM D 5385, 231 feet.
  - 5. Low Temperture flexibility: Per CGSB 37-GP-56M, no cracks.
  - 6. Moisture Vapor Permeation: Per ASTM E96. 0.017 perm.
- C. Approved Manufacturers: GCP Applied Technologies, W.R. Meadows, & Tremco

D. Substitutions: per 00 2100 - Instruction to Bidders and 00 7200 - General Conditions of the Contract.

#### 2.02 ACCESSORIES

- A. Provide all products to include but limited to (primers,tape, liquid membranes as required for a complete systems for manufacturers 5 year warranty.
- B. Prefabricated Drainage Composite: Equal to Hydroduct® 220 for vertical walls. Hydroduct® 660 for horizontal applications. Drainage Composite shall be designed to promote positive drainage while serving as a protection course

#### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that items that penetrate surfaces to receive waterproofing are securely installed.

#### 3.02 PREPARATION

- A. Protect adjacent surfaces not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions. Vacuum substrate clean.
- C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
- D. Seal cracks and joints with sealant using depth to width ratio as recommended by sealant manufacturer.
- E. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer. Protect conditioner from rain or frost until dry.

#### 3.03 INSTALLATION - MEMBRANE

- A. Install membrane waterproofing in strict accordance with manufacturer's instructions and warranty requirements.
- B. Roll out membrane. Minimize wrinkles and bubbles.
- C. Self-Adhering Membrane: Remove release paper layer. Roll out on substrate with a mechanical roller to encourage full contact bond.
- D. Overlap edges and ends and seal by method recommended by manufacturer, minimum 3 inches (75 mm). Seal permanently waterproof. Apply uniform bead of sealant to

joint edge.

- E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
- F. Weather lap joints on sloped substrate in direction of drainage. Seal joints and seams.
- G. Install flexible flashings. Seal items penetrating through membrane with flexible flashings. Seal watertight to membrane.
- H. Seal membrane and flashings to adjoining surfaces. Install counterflashing over all exposed edges.

#### 3.04 PROTECTION

- A. Per Manufacturers recommendations
- B. Do not permit traffic over unprotected or uncovered membrane.
- C. Protect from sunlight as quickly as possible after installation. (maximum UV exposire Limt: 30 days)
- D. Avoid damage from other trades, materials, or backfill.

## 3.05 INSPECTION AND REPAIR

- A. Review all work and check if there are damaged areas or inadiquately lapped seams.
- B. If repair is necessary, patch with sheet waterproofing membrane. Patch must extend 6 inches in every direction from damaged area. Roll the patch firmly and seal edges with manufacturer's sealant.
- C. Only repair when the membrane is dry.

## END OF SECTION 07 1300

#### SECTION 07 2100 - THERMAL INSULATION

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction and exterior wall behind \_\_\_\_\_ wall finish

## 1.02 REFERENCE STANDARDS

- A. ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2015a.
- B. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

## 1.03 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

## PART 2 PRODUCTS

## 2.01 APPLICATIONS

- A. Insulation Inside Masonry Cavity Walls: Extruded polystyrene (XPS) board.
- B. Insulation Over Metal Stud Framed Walls, Continuous: Extruded polystyrene (XPS) board.

#### 2.02 FOAM BOARD INSULATION MATERIALS

- A. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.
  - 1. Where Extruded Polystyrene (XPS) Board Insulation ("Rigid Insulation" on the Drawings) is indicated, thickness shall be 2" unless noted otherwise.
  - 2. Flame Spread Index (FSI): Class A 0 to 25, when tested in accordance with ASTM E84.
  - 3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.

- 4. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88) per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
- 5. R-value (RSI-value); 1 inch (25 mm) of material at 72 degrees F (22 C): 5 (0.88), minimum.
- 6. Board Edges: Square.

#### 7. Manufacturers:

- a. Dow Chemical Company; STYROFOAM HIGHLOAD 40: www.dowbuildingsolutions.com/#sle.
- b. Kingspan Insulation LLC; GreenGuard XPS Type IV, 25 psi: www.kingspan.com/#sle.
- c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.
- 8. Substitutions: See Section 01 6000 Product Requirements.

#### 2.03 ACCESSORIES

- A. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
- B. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.

## **PART 3 EXECUTION**

#### 3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

#### 3.02 BOARD INSTALLATION AT EXTERIOR WALLS

- A. Install boards horizontally on walls.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

# 3.03 BOARD INSTALLATION AT CAVITY WALLS

- A. Install boards to fit snugly between wall ties.
- B. Install boards horizontally on walls.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

# 3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

# END OF SECTION 07 2100

This page intentionally left blank

#### SECTION 07 2119 - SPRAY FOAM INSULATION

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Foamed-in-place insulation.
- B. Protective intumescent coating.
- C. Other locations as indicated on the drawings and as required to provide complete insulated envelope.

## 1.02 RELATED REQUIREMENTS

- A. Section 06 1000 Rough Carpentry.
- B. Section 05 4000 Cold-Formed Metal Framing.
- C. Section 09 2116 Gypsum Wallboard Assemblies.

#### 1.03 REFERENCE STANDARDS

- A. ASTM C177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2004.
- B. ASTM C1029 Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation; 2009.
- C. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2010.
- D. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2008.
- E. ASTM D2842 Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2012.
- F. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- G. ASTM E96/E96M Standard Test Methods for Water Vapor Transmission of Materials; 2014.
- H. ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

## 1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

#### 1.05 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.
- C. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.
- D. Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- E. Provide written verification from manufacturer for intended use and compatibility with all adjacent materials to including but not limited to metal studs, gypsum board, and exterior sheathing.

## 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience.

# 1.07 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame and smoke limitations.

## 1.08 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

## PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Foamed-In-Place Insulation:
  - 1. Demilec (USA) LLC; SEALection 500: www.demilecusa.com.
  - 2. Icynene Inc; Icynene LD-C-50: www.icynene.com.

3. Substitutions: See Section 01 6000 - Product Requirements.

#### 2.02 MATERIALS

- A. Foamed-In-Place Insulation: Low-density, flexible, open celled, water vapor permeable polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas. Provide in all places unless noted otherwise.
  - 1. Aged Thermal Resistance: R-value (RSI-value) of R-19 exterior walls, R-30 Roof (deg F hr sq ft)/Btu ( (K sqm)/W), minimum, when tested at 1 inch (25.4 mm) thickness in accordance with ASTM C518 after aging for 180 days at 41 degrees F (23 degrees C).
  - 2. Air Permeance: 0.004 cfm/sq ft (0.2 L/second sq meter), maximum, when tested at intended thickness in accordance with ASTM E2178 or ASTM E283 at 1.5 psf (75 Pa).
  - 3. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
  - 4. Manufacturers:
    - a. Demilec (USA) LLC; SEALection 500: www.demilecusa.com.
    - b. Icynene Inc; LD-C-50: www.icynene.com.
    - c. Henry Company: Permax 0.5
    - d. Substitutions: See Section 01 6000 Product Requirements.

## 2.03 ACCESSORIES

A. Protective Coating: Intumescent coating of type recommended by insulation manufacturer and as required to comply with applicable codes.

#### PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify work within construction spaces or crevices is complete prior to insulation application.
- B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation or overcoat adhesion.

#### 3.02 PREPARATION

- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.

## 3.03 APPLICATION

- A. Apply insulation in accordance with manufacturer's instructions.
- B. Apply insulation by spray method, to a uniform monolithic density without voids.
- C. Apply overcoat monolithically, without voids to fully cover foam insulation, to achieve fire rating required.
- D. Patch damaged areas.
- E. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.
- F. Trim excess away for applied trim or remove as required for continuous sealant bead.

# 3.04 FIELD QUALITY CONTROL

A. Field inspections and tests will be performed by an independent testing agency under provisions of Section 01 4000 - Quality Requirements.

## 3.05 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

## **END OF SECTION 07 2119**

### SECTION 07 2500 - WEATHER BARRIERS

## **PART 1 - GENERAL**

### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### 1.02 SUMMARY

- A. This Section includes the following:
  - 1. Materials and installation methods for fluid applied, vapor permeable air barrier membrane system located in the non-accessible part of the wall.
  - 2. Materials and installation methods to bridge and seal air leakage pathways in window and door openings, control and expansion joints, masonry ties, piping and other penetrations through the wall assembly.
- B. Related Sections include the following:
  - 1. Section 04 2000 Unit Masonry
  - 2. Section 05 4000 Cold-Formed Metal Framing
  - 3. Section 06 1000 Rough Carpentry
  - 4. Section 07 6200 Sheet Metal Flashing and Trim
  - 5. Section 07 9005 Joint Sealers
- C. Provide single source manufacturers for Section 07 2500 Weather Barrier, Section 07 6500 Wall Flashing, Termination Bars (refer to 04 2000), and termination bar sealants (refer to 07 9005) as required to ensure compatibly among all products installed as a part of the moisture control assembly at the exterior walls.
  - Where single source cannot be provided, notify architect and provide written
    verification from manufacturers of all products intended for installation to ensure
    products from multiple manufacturers are compatible and all specified warranties
    can be provided and maintained in full force and effect for the entirety of the
    specified warranty periods for each product.

# 1.03 DEFINITIONS

A. Air Barrier Assembly: The collection of air barrier materials and auxiliary materials applied to an opaque wall, including joints and junctions to abutting construction, to

control air movement through the wall.

# 1.04 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
  - 1. The building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of the conditioned space. An air barrier shall also be provided for interior partitions between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the conditioned space by more than 50% of the difference between the conditioned space and design ambient conditions. The air barrier shall have the following characteristics:
    - a. It must be continuous, with all joints made airtight.
    - b. It shall have an air permeability not to exceed 0.004 cfm/sq. ft. under a pressure differential of 0.3 in. water. (1.57 psf.) (equal to 0.02L/sq. m @ 75 Pa.).
    - c. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.
    - d. It shall be durable or maintainable.
    - e. The air barrier shall be joined in an airtight and flexible manner to the air barrier material of adjacent systems, allowing for the relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between:
      - 1) Walls and windows or doors.
      - 2) Different wall cladding systems.
      - 3) Wall over unconditioned space.
      - 4) Walls across construction, control and expansion joints.

- 5) Walls to utility, pipe and duct penetrations.
- 6) All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made airtight.

### 1.05 REFERENCES

- A. The following standards and publications are applicable to the extent referenced in the text. The most recent version of these standards is implied unless otherwise stated.
- B. American Society for Testing and Materials (ASTM)
  - 1. C920 Specifications for Elastomeric Joint Sealants
  - 2. C1193 Guide for Use of Joint Sealants
  - 3. D412 Standard Test Methods for Rubber Properties in Tension
  - 4. D570 Test Method for Water Absorption of Plastics
  - 5. D1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting
  - 6. D1876 Test Method for Peel Resistance of Adhesives
  - 7. D1938 Test Method for Tear Propagation Resistance of Plastic Film and Sheeting
  - 8. D1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
  - 9. D4258 Practice for Surface Cleaning Concrete for Coating
  - D4263 Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
  - 11. E96 Test Methods for Water Vapor Transmission of Materials
  - 12. E154 Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
  - 13. E162 Test Method for Surface Flammability of Materials Using a Radiant Heat Source
  - E1186 Practice for Air Leakage Site Detection in Building Envelopes and Air Retarder Systems
  - 15. E2178-01 Standard Test Method for Air Permeance of Building Materials

#### 1.06 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of air barrier.
- B. Shop Drawings: Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
  - 1. Include details of interfaces with other materials that form part of air barrier.
  - 2. Include details of mockups.
- C. Samples: Submit representative samples of the following for approval:
  - 1. Fluid applied membrane
  - 2. Transition tape
  - 3. Through Wall Flashing
- D. Product Certificates: For air barriers, certifying compatibility of air barrier and accessory materials with Project materials that connect to or that come in contact with the barrier; signed by product manufacturer.
- 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. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for air barriers, submit certified test report showing compliance with requirements specified for ASTM E2178.
- G. Warranty: Submit a sample warranty identifying the terms and conditions stated in this specification.

# 1.07 QUALITY ASSURANCE

A. Manufacturer: Air barrier systems shall be manufactured and marketed by a firm with a minimum of 5 years experience in the production and sales of waterproofing. Manufacturers proposed for use, but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past five years.

- B. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- C. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Preinstallation conference shall include the Contractor, installer, Architect, and system manufacturer's field representative. Agenda for meeting shall include but not be limited to the following:
  - 1. Review of submittals.
  - 2. Review of surface preparation, minimum curing period and installation procedures.
  - 3. Review of special details and flashings.
  - 4. Sequence of construction, responsibilities and schedule for subsequent operations.
  - 5. Review of mock-up requirements.
  - 6. Review of inspection, testing, protection and repair procedures.

# 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.
- B. Do not double-stack pallets of fluid applied membrane components on the job site. Provide cover on top and all sides, allowing for adequate ventilation.
- C. Protect fluid-applied membrane components from freezing and extreme heat.
- D. Sequence deliveries to avoid delays, but minimize on-site storage.

# 1.09 PROJECT CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air barrier manufacturer. Protect substrates from environmental conditions that affect performance of air barrier. Do not apply air barrier to a wet substrate or during snow, rain, fog, or mist.

### 1.10 WARRANTY

- A. Material Warranty: Manufacturer's standard form in which manufacturer agrees to replace fluid-applied air barrier membrane materials, that fail within specified warranty period when installed and used in strict conformance with written manufacturer's instructions.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure to maintain air permeance rating not to exceed 0.02 L/s/sq. m. when tested per ASTM E2178, within specified warranty period.
    - b. Failure to maintain a vapor permeance rating greater than 10 perms when tested in accordance with ATM E96, Method B.
  - 2. Warranty Period: Five years from date of Final Acceptance, signed by the authorized Waterproofing Subcontractor and the authorized General Contractor.

## **PART 2 - PRODUCTS**

# 2.01 FLUID-APPLIED, VAPOR PERMEABLE MEMBRANE AIR BARRIER

- A. Fluid applied to provide vapor permeable air and water barrier fully adhered membrane. Comply with NFPA 285.
- B. **Fluid-Applied, Vapor-Permeable Membrane Air Barrier** shall be equal to Products with the following Physical and Performance Properties: Hohmann Barnard **EnviroBarrier VP** 
  - 1. Membrane Air Permeance: Not to exceed 0.0004 cfm/sq. ft. of surface area (at specified thickness) at 1.57-lbf/sq. ft. pressure difference (0.002 L/s x sq. m of surface area at 75-Pa) when applied to CMU wall; when tested per ASTM E2178.
  - 2. Membrane Vapor Permeance: Not less than 11.2 perms (649.6 ng/Pa x s x sq. m); when tested per ASTM E96.
  - 3. UV Exposure Limit: Not more than 150 calendar days; per ASTM D412 and ASTM E96-Method B.
- C. W.R. Meadow, Air Shield LM
- D. Tremco Exoair
- E. Hohmann and Barnard Enviro-Barrier VP
- F. Perm-A-Barrier VP, as manufactured by Grace Construction Products

### 2.02 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by air barrier manufacturer for intended use and compatible with air barrier membrane. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Liquid Membrane for Details and Terminations: Provide Bituthene Liquid Membrane or equal as recommended by air barrier manufacturer.
- C. Wall Primer (for Use with Throughwall Flashing and Tapes Applied to Substrate): Liquid waterborne primer recommended for substrate by manufacturer of air barrier material.
  - 1. Flash Point: No flash to boiling point
  - 2. Solvent Type: Water
  - 3. VOC Content: Not to exceed 10 g/l
  - 4. Application Temperature: -4°C (25°F) and above
  - 5. Freezing point (as packaged): -7°C (21°F)
  - 6. Product: Perm-A-Barrier WB Primer manufactured by Grace Construction Products.

## D. Flexible- Through Wall Membrane Flashing equal to Hohmann Barnard

**Textroflash**: (40 mils) of self-adhesive rubberized asphalt integrally bonded to 0.2 mm (8 mil) of cross-laminated, high-density polyethylene film to provide a min. 1.0 mm (40 mil) thick membrane. Membrane shall be interleaved with disposable silicone-coated release paper until installed, conforming with the following:

- 1. Water Vapor Transmission: ASTM E96, Method B: 2.9 ng/m2sPa (0.05 perms) max.
- 2. Water Absorption: ASTM D570: max. 0.1% by weight
- 3. Puncture Resistance: ASTM E154: 356 N (80 lbs.) min.
- 4. Tear Resistance
  - a. Initiation ASTM D1004: min. 58 N (13.0 lbs.) M.D.
  - b. Propagation ASTM D1938: min. 40 N (9.0 lbs.) M.D.
    - 1) Lap Adhesion at -4°C (25°F): ASTM D1876: 880 N/m (5.0 lbs./in.) of width

- 2) Low Temperature Flexibility ASTM D1970: Unaffected to -43°C (-45°F)
- 3) Tensile Strength: ASTM D412, Die C Modified: min. 5.5 MPa (800 psi)
- 4) Elongation, Ultimate Failure of Rubberized Asphalt: ASTM D412, Die C: min. 200%.
- 5) For additional requirements see Section 07 6500 Wall Flashing
- E. Joint Reinforcing Strip: Air barrier manufacturer's approved tape.
- F. **Transition Membrane equal to Hohmann Barnard X-Seal:** (40 mils) of self-adhesive rubberized asphalt integrally bonded to 0.2 mm (8 mil) of cross-laminated, high-density polyethylene film to provide a min. 1.0 mm (40 mil) thick membrane. Membrane shall be interleaved with disposable silicone-coated release paper until installed, conforming with the following: Membrane shall be compatible with Weather Barrier, such that weather barrier will adhere to transistion membrane.
  - 1. Water Vapor Transmission: ASTM E96, Method B: 2.9 ng/m2sPa (0.05 perms) max.
  - 2. Water Absorption: ASTM D570: max. 0.1% by weight
  - 3. Puncture Resistance: ASTM E154: 356 N (80 lbs.) min.
  - 4. Tear Resistance
    - a. Initiation ASTM D1004: min. 58 N (13.0 lbs.) M.D.
    - b. Propagation ASTM D1938: min. 40 N (9.0 lbs.) M.D.
  - 5. Lap Adhesion at -4°C (25°F): ASTM D1876: 880 N/m (5.0 lbs./in.) of width
  - 6. Low Temperature Flexibility ASTM D1970: Unaffected to -43°C (-45°F)
  - 7. Tensile Strength: ASTM D412, Die C Modified: min. 5.5 MPa (800 psi)
  - 8. Elongation, Ultimate Failure of Rubberized Asphalt: ASTM D412, Die C: min. 200%.
- G. Substrate Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
  - 1. Product: Bituthene Liquid Membrane or equal as recommended by air barrier manufacturer.

- H. Sprayed Polyurethane Foam Sealant: 1- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft (24 to 32 kg/cu. m) density; flame spread index of 25 or less according to ASTM E162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.
- I. Joint Sealant: ASTM C920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O.

## **PART 3 - EXECUTION**

## 3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
  - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
  - 2. Verify that concrete has cured and aged for minimum time period recommended by air barrier manufacturer.
  - 3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.
  - 4. Verify that masonry joints are struck flush and completely filled with mortar.
  - 5. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 SURFACE PREPARATION

- A. Refer to manufacturer's literature for requirements for preparation of substrates.

  Surfaces shall be sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of the fluid-applied air barrier system.
- B. Exterior sheathing panels: Ensure that the boards are sufficiently stabilized with corners and edges fastened with appropriate screws. Pre-treat all board joints with 50 75mm (2-3 in.) wide, manufacturer's recommended self-adhesive tape. Gaps greater than 6mm (1/4 in.) should be filled with mastic or caulk, allowing sufficient time to fully cure before application of the tape and fluid applied air barrier system.
- C. Related Materials: Treat construction joints and install flashing as recommended by manufacturer.

- D. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
- E. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- F. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- G. At changes in substrate plane, apply sealant or membrane equal to Bituthene Liquid Membrane at sharp corners and edges to form a smooth transition from one plane to another.
- H. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

### 3.03 JOINT TREATMENT

A. Gypsum Sheathing: Fill joints greater than 1/4 inch (6 mm) with sealant according to ASTM C1193 and with air barrier manufacturer's written instructions. Apply tape to joint prior to installing fluid air barrier membrane.

### 3.04 AIR BARRIER MEMBRANE INSTALLATION

- A. Prior to screw attaching masonry anchors, as specified in Section 04810, to the substrate (usually paperless gypsum sheathing, as specified in Section 05400), the vapor permeable, fluid-applied membrane air barrier must be applied. The vapor permeable, fluid-applied membrane is then reapplied over the masonry anchor after the masonry anchor is screw attached to assure a waterproof condition if required by the membrane air barrier manufacturer, as a result of the warranty specified at the end of this section.
- B. Apply air barrier membrane to achieve a continuous air barrier according to air barrier manufacturer's written instructions.
- C. Apply air barrier membrane within manufacturer's recommended application temperature ranges.
- D. Apply a continuous unbroken air barrier to substrates according to the following minimum thickness. Apply membrane in full contact around protrusions such as masonry ties.
  - 1. Vapor-Permeable Membrane Air Barrier: 90-mil (2.4-mm) wet film thickness, 45-mil (1.2-mm) dry film thickness.

- E. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- F. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.

## 3.05 TRANSITION STRIP INSTALLATION

- A. Install strips, transition strips, and auxiliary materials according to air barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
  - 1. Install all flashings only after application of air barrier.
- B. Apply primer to substrates to receive transition tapes at required rate and allow to dry. Limit priming to areas that will be covered by transition tape in same day. Reprime areas exposed for more than 24 hours.
  - 1. Prime glass-fiber-surfaced gypsum sheathing not covered with air membrane material with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- C. Connect and seal exterior wall air barrier membrane continuously to floor-to floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- E. Apply joint sealants forming part of air barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Wall Openings: Prime concealed perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches (75 mm) of coverage is achieved over both substrates. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.
  - 1. Transition Strip: Roll firmly to enhance adhesion.
- G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air barrier membrane with foam sealant.

H. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction.

# 3.06 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Inspections: Air barrier materials and installation are subject to inspection for compliance with requirements. Inspections may include the following:
  - 1. Continuity of air barrier system has been achieved throughout the building envelope with no gaps or holes.
  - 2. Continuous structural support of air barrier system has been provided.
  - 3. Masonry and concrete surfaces are smooth, clean and free of cavities, protrusions, and mortar droppings.
  - 4. Site conditions for application temperature and dryness of substrates have been maintained.
  - 5. Maximum exposure time of materials to UV deterioration has not been exceeded.
  - 6. Surfaces have been primed, if applicable.
  - 7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
  - 8. Termination mastic has been applied on cut edges.
  - 9. Strips and transition strips have been firmly adhered to substrate.
  - 10. Compatible materials have been used.
  - 11. Transitions at changes in direction and structural support at gaps have been provided.
  - 12. Connections between assemblies (membrane and sealants) have complied with requirements for cleanliness, preparation and priming of surfaces, structural support, integrity, and continuity of seal.
  - 13. All penetrations have been sealed.

- C. Tests: Testing to be performed will be determined by Owner's testing agency from among the following tests:
  - 1. Qualitative Testing: Air barrier assemblies will be tested for evidence of air leakage according to ASTM E1186, smoke pencil with pressurization or depressurization.
- D. Remove and replace deficient air barrier components and retest as specified above.

## 3.07 CLEANING AND PROTECTION

- A. Protect air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
- B. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace air barrier exposed for more than 150 days.
- C. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.
- D. Remove masking materials after installation.

## 3.08 WARRANTY

A. A. The Waterproofing Contractor and General Contractor shall provide a five (5) year warranty subject to the terms and conditions as rendered in the Project Waterproofing Warranty included at the end of this section.

### PROJECT WATERPROOFING WARRANTY

CONTRACTOR:
DATE OF

- A. The Waterproofing Contractor and General Contractor do hereby certify that the vapor permeable, fluid-applied membrane work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved waterproofing manufacturers' recommendations.
- B. The Waterproofing Contractor and General Contractor do hereby guarantee the waterproofing and associated work including but not limited to all vapor permeable, fluid-applied membrane air barrier vertical and horizontal waterproofing to be water tight 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 Final Acceptance of the project.
- C. Subject to the terms and conditions listed below, the Waterproofing Contractor and General Contractor also guarantee 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 vapor permeable, fluid-applied membrane air barrier manufacturers recommendations as are necessary to correct faulty and defective work and/or materials which may develop in the work including. Anticipated life of the waterproofing systems and the best standards applicable to the particular waterproofing type in value and in accordance with construction documents as are necessary to maintain said work in watertight conditions, and further, to respond on or within seven (7) calendar days upon proper notification of leaks or defects by the Owner.
  - During the Guarantee Period, if the Owner allows alteration of the work by anyone
    other the Waterproofing Contractor or the General Contractor, including cutting,
    patching and maintenance in connection with penetrations, and positioning of
    anything affected by, this Guarantee shall become null and void upon the date of
    said alterations

- 2. 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 waterproofed areas, and any damage caused by such addition.
- 3. The Owner shall promptly notify the Waterproofing Contractor or General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the Waterproofing Contractor or General Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

this day of	(year).	
Waterproofing Contractor Authorized	or's General Contractor's Signature	Authorized Signatur
Typed Name and Title	Typed Name and '	Title

END OF SECTION 07272 07 2500

This page intentionally left blank

### **SECTION 07 4113 - METAL ROOF PANELS**

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

A. Mechanically-seamed, standing seam metal roof panels, with related metal trim and accessories.

# 1.02 RELATED REQUIREMENTS

- A. Division 05 Section "Structural Steel Framing" for structural steel framing supporting metal panels.
- B. Division 05 Section "Steel Decking" for continuous metal decking supporting metal panels.
- C. Division 05 Section "Cold-Formed Metal Trusses" for cold-formed metal trusses supporting metal panels.
- D. Division 07 Section ["Thermal Insulation"] ["Roof Insulation"] for thermal insulation installed under metal panels.
- E. Division 07 Section "Air Barriers" for air barriers within roof assembly and adjacent to roof assembly.
- F. Division 07 Section "Metal Wall Panels" for factory-formed metal wall [and soffit] panels.
- G. Division 07 Section "Sheet Metal Flashing and Trim" for formed sheet metal copings, flashings, reglets, and roof drainage items in addition to items specified in this Section.
- H. Division 07 Section "Manufactured Roof Specialties" for manufactured copings, reglets, and roof drainage items in addition to items specified in this Section.
- I. Division 07 Section "Joint Sealants <a href="http://www.mbci.com/pdf/specsheet/Joint Sealant Specifications.pdf">http://www.mbci.com/pdf/specsheet/Joint Sealant Specifications.pdf</a>.
  <a href="http://www.mbci.com/pdf/specsheet/Joint Sealant Specifications.pdf">http://www.mbci.com/pdf/specsheet/Joint Sealant Specifications.pdf</a>.
- J. Division 13 Section "Metal Building Systems" for steel framing supporting metal panels.

#### 1.03 REFERENCES

A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org <a href="http://www.aamanet.org">http://www.aamanet.org</a>:

- 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 <a href="http://www.asce.org/codes-standards">http://www.asce.org/codes-standards</a>:
  - 1. ASCE 7 Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): www.astm.org <a href="http://www.astm.org">http://www.astm.org</a>:
  - 1. ASTM A 653 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM A 755 Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
  - 3. ASTM A 792/A 792M Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
  - 4. ASTM A 980 Standard Specification for Steel, Sheet, Carbon, Ultra High Strength Cold Rolled.
  - 5. ASTM C 645 Specification for Nonstructural Steel Framing Members.
  - 6. ASTM D 226 Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
  - 7. ASTM D 1003 Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
  - 8. ASTM D 2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
  - 9. ASTM D 4214 Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
  - 10. ASTM E 1592 Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
  - 11. ASTM E 1646 Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.

- 12. ASTM E 1680 Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.
- 13. ASTM E 1980 Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
- D. Cool Roof Rating Council (CRRC): www.coolroofs.org/productratingprogram.html <a href="http://www.coolroofs.org/productratingprogram.html">http://www.coolroofs.org/productratingprogram.html</a>:
  - 1. CRRC-1-2008 CRRC Product Rating Program.
- E. International Accreditation Service (IAS):
  - IAS AC 472 Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.
- F. Underwriters Laboratories, Inc. (UL): www.ul.com <a href="http://www.ul.com">www.ul.com</a>:
  - 1. UL 580 Tests for Uplift Resistance of Roof Assemblies
- G. US Environmental Protection Agency: www.energystar.gov/index.cfm <a href="http://www.energystar.gov/index.cfm">http://www.energystar.gov/index.cfm</a>:
  - 1. Energy Star Reflective Roof Products.
- H. US Green Building Council (USGBC): www.usgbc.org <a href="http://www.usgbc.org">www.usgbc.org</a>:
  - 1. LEED Leadership in Energy and Environmental Design (LEED) Green Building Rating Systems.

# 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's technical representative, inspection agency and related trade contractors.
  - 1. Coordinate building framing in relation to metal panel system.
  - 2. Coordinate openings and penetrations of metal panel system.
  - 3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

# 1.05 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal roof panel assembly and accessories from a single manufacturer providing fixed-base roll forming, and accredited under IAS AC 472 Part B.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.
  - 1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
    - a. Product data, including certified independent test data indicating compliance with requirements.
    - b. Samples of each component.
    - c. Sample submittal from similar project.
    - d. Project references: Minimum of five installations not less than five years old, with Owner and Architect contact information.
    - e. Sample warranty.
    - f. IAS AC 472 certificate.
  - 2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
  - 3. Approved manufacturers must meet separate requirements of Submittals Article.
- C. Installer Qualifications: Experienced Installer [certified by metal panel manufacturer] with minimum of five years experience with successfully completed projects of a similar nature and scope.
  - 1. Installer's Field Supervisor: Experienced mechanic [certified by metal panel manufacturer] supervising work on site whenever work is underway.

# 1.06 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets for specified products.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement,

flashings, openings, penetrations, roof accessories, lightning arresting equipment, and special details. Make distinctions between factory and field assembled work.

- 1. Indicate points of supporting structure that must coordinate with metal panel system installation.
- 2. Include data indicating compliance with performance requirements.
- 3. Include structural data indicating compliance with requirements of authorities having jurisdiction.
- C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.

# 1.07 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicating compliance of products with requirements, witnessed by a professional engineer.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC 472.
- D. Manufacturer's Warranty: Sample copy of manufacturer's standard warranty.

## 1.08 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's standard warranty.

# 1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
  - 1. Deliver, unload, store, and erect metal panel system and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
  - 2. Store in accordance with Manufacturer's written instructions. Provide wood collars for stacking and handling in the field.

### 1.10 COORDINATION

A. Coordinate sizes, profiles, and locations of roof curbs and other roof-mounted equipment and roof penetrations, based upon sizes of actual selected equipment.

### 1.11 WARRANTY

- A. Provide warranty per the section 07 0100 Special Project Warranty by roofing contractor and General Contractor.
- B. Special Manufacturer's Warranty: Furnish manufacturer's no-dollar-limit materials and workmanship warranty for the roofing system. The warranty period shall not be less than 25 years from the date of Government acceptance of the work. The warranty shall be issued directly to the Government. The warranty shall provide that if within the warranty period the metal roofing system becomes non-watertight or shows evidence of corrosion, perforation, rupture or excess weathering due to deterioration of the roofing system resulting from defective materials or installed workmanship the repair or replacement of the defective materials and correction of the defective workmanship shall be the responsibility of the roofing system manufacturer. Repairs that become necessary because of defective materials and workmanship while under warranty shall be performed within 7 days after notification, unless additional time is approved by the Contracting Officer. Failure to perform repairs within the specified period of time will constitute grounds for having the repairs performed by others and the cost billed to the manufacturer.
- C. Special Weather tightness Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail to remain weathertight, including leaks, without monetary limitation for 25 years from date of Final Completion.
- D. Warranties shall be provided in accordance with UFC 3-110-03 warranty requirements.
- E. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within the warranty period, as follows:
  - 1. Fluoropolymer Two-Coat System:
    - a. Basis of Design System: MBCI, Signature 300, 70 % PVDF resin.
    - b. Color fading in excess of 5 Hunter units per ASTM D2244.
    - c. Chalking in excess of No. 8 rating per ASTM D4214.
    - d. Failure of adhesion, peeling, checking, or cracking.

e. Warranty Period: [25] years from date of Substantial Completion.

## **PART 2 PRODUCTS**

### 2.01 MANUFACTURER

- A. Basis of Design Manufacturer: MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.; Houston TX. Tel: (877)713-6224; Email: info@mbci.com <mailto:info@ecoficientseries.com>; Web: www.mbci.com <http://www.mbci.com>.
  - 1. Provide basis of design product or comparable product approved by Architect prior to bid.
- B. Acceptable manufacturers provided products comply with the contract documents.
  - 1. Petersen Aluminum Corporation
  - 2. Morin, a Kingspan Group Company
  - 3. Merchant & Evans
  - 4. Dimensional Metals, Inc.
  - 5. ATAS International
  - 6. Berridge Manufacturing Co.

# 2.02 PERFORMANCE REQUIREMENTS

- A. General: Provide metal roof panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Recycled Content: For Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [25] percent.
- C. Radiative Property Performance:
  - 1. Solar Reflectance Index: Minimum 78 for roof slopes of 2:12 or less and 29 for roof slopes greater than 2:12 under medium wind conditions, per ASTM E 1980.
  - 2. Energy Star Qualified: Listed on USDoE ENERGY STAR Roof Products Qualified Product List.
  - 3. Energy Performance: Listed in CRRC Rated Product Directory, with minimum properties as required by applicable Energy efficiency or High-Performance Green Building standard.

- D. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated:
  - 1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed.
    - a. Wind Uplift Testing: Certify capacity of metal panels by actual testing of proposed assembly per ASTM E 1592.
    - b. Comply with all local wind zone requirements.
  - 2. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of L/240 of the span with no evidence of failure.
  - 3. Seismic Performance: Comply with ASCE 7, Section 9, "Earthquake Loads."
- E. Wind Uplift Resistance: Comply with UL 580 for wind-uplift class UL-120.
- F. Air Infiltration, ASTM E 1680: Maximum 0.25 cfm/sq. ft. (1.27 L/s per sq. m) at static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- G. Water Penetration Static Pressure, ASTM E 1646: No uncontrolled water penetration at a static pressure of 12 lbf/sq. ft. (575 Pa).
- H. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

## 2.03 METAL ROOF PANELS

- A. Mechanically-seamed, Concealed Fastener, Metal Roof Panels: Structural metal roof panel consisting of formed metal sheet with vertical ribs at panel edges, installed by lapping and mechanically interlocking edges of adjacent panels, and attaching panels to supports using concealed clips and fasteners in a weathertight installation.
  - 1. Basis of Design: MBCI, BattenLok HS, www.mbci.com/battenlokHS.html <a href="http://www.mbci.com/battenlokHS.html">http://www.mbci.com/battenlokHS.html</a>.
  - 2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), prepainted by the coil-coating process per ASTM A 755/A 755M.
    - a. Nominal Coated Thickness: 22 gage.

- b. Panel Surface: Smooth with striations in pan
- c. Exterior Finish: Fluoropolymer two-coat metallic color system
- d. Color: As selected by Architect from manufacturer's standard colors.
- 3. Panel Width: 16 inches (406 mm).
- 4. Panel Seam Height: 2 inch (50.8 mm).
- 5. Joint Type: Mechanically seamed.

## 2.04 METAL ROOF PANEL ACCESSORIES

- A. General: Provide complete metal roof panel assembly incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings, in [manufacturer's standard profiles] and [profiles as indicated]. Provide required fasteners, closure strips, thermal spacers, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.
- C. Panel Clips: Provide panel clip of type specified, at spacing indicated on approved shop drawings.
  - 1. Two-piece Floating: ASTM C 645, with ASTM A 653/A 653M, G90 (Z180) hot-dip galvanized zinc coating, configured for concealment in panel joints, and identical to clips utilized in tests demonstrating compliance with performance requirements. Provide bearing plates for panel clips.
- D. Panel Fasteners: Self-tapping screws and other acceptable corrosion-resistant fasteners recommended by roof panel manufacturer. Where exposed fasteners cannot be avoided, supply fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.
- E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:
  - 1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
  - 2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
- F. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.
- G. Insulation:

1. Thermal Insulation: Fiberglas felt faced Polyisocyanurate board insulation. ASTM C1289, Type II, compressive strength of 25 psi with maximum flame spread and smoke development indexes of 75 and 450 respectively. Provide thickness as required to achieve R-25 taking into account thermal drift after 2 years. Base layer of 2.0" ISO (R11.4); Top layer of 2.5" ISO (R14.4) Total R-Value of 25.8.

# H. Roofing Underlayment:

- 1. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 Mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl of SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
  - a. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
  - b. Low-temperature Flexibility: ASTM D 1970; passes after Testing at minus 20 deg F (29 deg C).
  - c. Products: Subject to compliance with requirements, provide one of the following:
    - 1) Carlisle Coating & Waterproofing Inc.; CCW WIP 300HT.
    - 2) Grace Construction Products, a unit of W.R. Grace & Co.; Ultra.
    - 3) Owens Corning; WeatherLock Metal High Temperature Underlayment.

### I. Information Card

1. For each roof, provide a typewritten card, laminated in plastic and framed for interior display or a photoengraved 0.032 inch thick alumimum card for exterior display. Card to be 8 1/2 by 11 inches minimum and contain the information listed on form 1 provide by architect. Install card near point of access to roof, or where indicated.

### 2.05 FABRICATION

- A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.

- C. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

## 2.06 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 0.3 mil primer with 0.7 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621[, meeting solar reflectance index requirements].
  - 1. Basis of Design: MBCI, Signature 300.
- C. Interior Finish: 0.5 mil (0.013 mm) total dry film thickness consisting of primer coat and wash coat of manufacturer's standard light-colored acrylic or polyester backer finish.

### PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Examine metal panel system substrate and supports with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panel installation.
  - Inspect metal panel support substrate to determine if support components are
    installed as indicated on approved shop drawings. Confirm presence of acceptable
    supports at recommended spacing to match installation requirements of metal
    panels.
  - 2. Panel Support Tolerances: Confirm that panel supports are within tolerances acceptable to metal panel system manufacturer but not greater than the following:
    - a. 1/4 inch (6 mm) in 20 foot (6.1 m) in any direction.
    - b. 3/8 inch (9 mm) over any single roof plane.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal roof panel system installation.

### 3.02 PREPARATION

- A. Miscellaneous Supports: Install subframing, girts, furring, and other miscellaneous panel support members according to ASTM C 754 and manufacturer's written instructions.
- B. Flashings: Provide flashings as required to complete metal roof panel system. Install in accordance with Section 07 62 00 "Sheet Metal Flashing and Trim" and approved shop drawings.

# 3.03 METAL PANEL INSTALLATION

- A. Mechanically-Seamed, Standing Seam Metal Roof Panels: Install weathertight metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal roof panels in orientation, sizes, and locations indicated, free of waves, warps, buckles, fastening stresses, and distortions. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Attach panels to supports using clips, screws, fasteners, and sealants recommended by manufacturer and indicated on approved shop drawings.
  - Fasten metal panels to supports with concealed clips at each location indicated on approved shop drawings, with spacing and fasteners recommended by manufacturer.
  - 2. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
  - 3. Provide weatherproof jacks for pipe and conduit penetrating metal panels of types recommended by manufacturer.
  - 4. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.

### 3.04 ACCESSORY INSTALLATION

A. General: Install metal panel trim, flashing, and accessories using recommended fasteners and joint sealers, with positive anchorage to building, and with weather tight mounting. Provide for thermal expansion. Coordinate installation with flashings and other components.

- 1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
- 2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
- 3. Provide concealed fasteners except where noted on approved shop drawings.
- 4. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.
- B. Joint Sealers: Install joint sealers where indicated and where required for weathertight performance of metal panel assemblies, in accordance with manufacturer's written instructions.
  - 1. Prepare joints and apply sealants per requirements of Division 07 Section "Joint Sealants <a href="http://www.mbci.com/guide\_specs/Joint Sealants.doc">http://www.mbci.com/guide\_specs/Joint Sealants.doc</a>."
- C. Install self adhered roofing underlayment in accordance with the manufacturer's instructions.
- D. Install thermal insulation board in accordance with manufacturer's instructions, uplift requirements, and all warranty requirements of the roof and insulation systems manufacturers.

# 3.05 FIELD QUALITY CONTROL

- A. Roofing Consulting Services:
  - 1. The Contractor shall engage the services of a Professional Roof Consultant. The Consultant must be listed as a Professional Member of the International Institute of Building Enclosure Consultants (IIBEC) and provide a certificate of adequate error and omissions insurance. The Consultant shall attend the pre-roofing meeting and perform no less than three (3) inspections during the installation of the new metal roof systems at each building (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 job progress and any deficiencies noted during the inspections. Upon completion of all punch list items, the Roof Consultant shall provide a letter of certification to the Architect/Owner stating the new wall/roof system has been installed per the requirements of the contract documents, manufacturer's requirements of the contract documents, manufacturer's requirements, and all warranty requirements.

- 2. Pre-approved Roof Consultants:
  - a. Williamson & Associates, Inc.

Alex Murry

5120 Roswell Road

Suite 100 South

Atlanta, Georgia 30342

(404) 256-2388

b. SMith Seckman Reid, Inc.

Michael Spach

2995 Sidco Drive

Nashville, TN 37204

(615) 460-0596

c. Nashville Roof Consultants

James R. Oldham

1411 Winding Way Rd.

Nashville, TN 37216

(615) 238-5737

3. Note: Non-specified Roof Consulting firms must be pre-approved by the Architect . Request for a substituting firm must be submitted "in writing" 5 (five) days prior to the bid opening.

# B. Manufacturer's Technical Representative

1. The representative shall have authorization from manufacturer to approve field changes and be thoroughly familiar with the products and with installations in the geographical area where construction will take place. The manufacturer's representative shall be an employee of the manufacturer with at least 5 years experience in installing the roof system. The representative shall be available to preform field inspections and attend meetings as required herein, and as requested by the Contracting Officer.

# C. Manufacturer's Field Inspections

Manufacturer's technical representative shall visit the site as necessary during the installation process to assure panels, flashings, and other components are being installed in a satisfactory manner. Manufacturer's technical representative shall perform a field inspection during the first 20 square of roof panel installation and at substantial completion prior to issuance of warranty, as a minimum, and as otherwise requested by the Contracting Officer. Additional inspections shall not exceed one for 100 squares of total roof area with the exception that follow-up inspections of previously noted deficiencies or application errors shall be performed as requested by the Contracting Officer. Each inspection visit shall include a review of the entire installation to date. After each inspection, a report, signed by the manufacturer's technical representative, shall be submitted to the Contracting Officer/Architect noting the overall quality of work, deficiencies and any other concerns, and recommended corrective actions in detail. Notify Contracting Officer a minimum of 3 workings days prior to site visit by manufacturer's technical representative.

## 3.06 CLEANING AND PROTECTION

- A. Remove temporary protective films immediately in accordance with metal roof panel manufacturer's instructions. Clean finished surfaces as recommended by metal roof panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

### END OF SECTION 07 4113

This page intentionally left blank

# **SECTION 07 4213 - RIBBED METAL WALL PANELS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Ribbed-profile, concealed fastener metal wall panels, with related metal trim, and accessories.

# 1.02 RELATED REQUIREMENTS

- A. Division 05 Section "Structural Steel Framing" for steel framing supporting metal panels.
- B. Division 05 Section "Cold-Formed Metal Framing" for cold-formed metal framing supporting metal panels.
- C. Division 07 Section "Thermal Insulation" for thermal insulation installed behind metal panels.
- D. Division 07 Section "Air Barriers" for air barriers within wall assembly and adjacent to wall assembly.
- E. Division 07 Section "Metal Soffit Panels" for soffit panels installed with metal wall panels.
- F. Division 07 Section "Sheet Metal Flashing and Trim" for sheet metal flashing items in addition to items specified in this Section.

## 1.03 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org <a href="http://www.aamanet.org">http://www.aamanet.org</a>:
  - 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 <a href="http://www.asce.org/codes-standards">http://www.asce.org/codes-standards</a>:
  - 1. ASCE 7 Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): www.astm.org <a href="http://www.astm.org">http://www.astm.org</a>:

- 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.
- D. International Accreditation Service (IAS):
  - 1. IAS AC472 Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.

# 1.04 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer accredited under IAS AC472. Part B.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.
  - 1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
    - a. Product data, including certified independent test data indicating compliance with requirements.
    - b. Samples of each component.

- c. Sample shop drawings from similar project.
- d. Project References: Minimum of five installations not less than three years old, with Owner and Architect contact information.
- e. Sample warranty.
- f. Certificate of accreditation under IAS AC472 Part B.
- 2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
- 3. Approved manufacturers must meet separate requirements of Submittals Article.
- C. Installer Qualifications: Experienced Installer with minimum of five years experience with successfully completed projects of a similar nature and scope.
  - 1. Installer's Field Supervisor: Experienced mechanic supervising work on site whenever work is underway.
- D. Steel Construction Publications: Comply with published recommendations in the following, unless more stringent requirements are indicated.
  - 1. American Institute of Steel Construction (AISC): "Steel Construction Manual."
  - 2. American Iron and Steel Institute (AISI): "Cold Formed Steel Design Manual."

# 1.05 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, metal panel installer, metal panel manufacturer's technical representative, inspection agency and related trade contractors.
  - 1. Coordinate building framing in relation to metal panel system.
  - 2. Coordinate openings and penetrations of metal panel system.
  - 3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

## 1.06 ACTION SUBMITTALS

A. Product Data: Manufacturer's data sheets for specified products. Include data indicating compliance with performance requirements.

- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, and special details. Make distinctions between factory and field assembled work.
  - 1. Indicate points of supporting structure that must coordinate with metal panel system installation.
  - 2. Include structural data indicating compliance with performance requirements and requirements of local authorities having jurisdiction.
- C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.

#### 1.07 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicating compliance of products with requirements.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC472 Part B.
- D. Manufacturer's warranty: Unexecuted sample copy of manufacturer's warranty.

#### 1.08 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.

## 1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
  - 1. Deliver, unload, store, and erect metal panels and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.

- 2. Store in accordance with Manufacturer's written instruction. Provide wood collars for stacking and handling in the field.
- 3. Shield foam insulated metal panels from direct sunlight until installation.

#### 1.10 WARRANTY

- A. Provide warranty per the section 07 0100 Special Project Warranty by roofing and metal wall panel contractor and General Contractor.
- B. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within 15 years from date of Final Completion.
- C. Special Weather tightness Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail to remain weathertight, including leaks, without monetary limitation for 15 years from date of Final Completion.
- D. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within the warranty period, as follows:
  - 1. Fluoropolymer Two-Coat System:
    - a. Basis of Design System: MBCI, Signature 300.
    - b. Color fading in excess of 5 Hunter units per ASTM D2244.
    - c. Chalking in excess of No. 8 rating per ASTM D4214.
    - d. Failure of adhesion, peeling, checking, or cracking.
    - e. Warranty Period: [25] years from date of Final Completion.

## **PART 2 PRODUCTS**

## 2.01 MANUFACTURER

- A. Basis of Design Manufacturer: MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.; Houston TX. Tel: (877)713-6224; Email: info@mbci.com <mailto:info@mbci.com>; Web: www.mbci.com <http://www.mbci.com>.
  - 1. Provide basis of design product, or comparable product approved by Architect prior to bid.
- B. Acceptable manufacturers, provided product comply with the contract documents.

- 1. Petersen Aluminum Corporation
- 2. Morin, a Kingspan Group Company
- 3. Merchant & Evans
- 4. Dimensional Metals, Inc.
- 5. ATAS International
- 6. Berridge Manufacturing Co.

## 2.02 PERFORMANCE REQUIREMENTS

- A. General: Provide metal panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Recycled Content: For Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [25] percent.
- C. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated, as determined by ASTM E1592:
  - 1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.
    - a. Wind Negative Pressure: Certify capacity of metal panels by actual testing of proposed assembly.
  - 2. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of L/120 of the span with no evidence of failure.
- D. Wall Panel Air Infiltration. ASTM E283:
  - 1. 0.002 cfm/sq. ft. air infiltration at static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
  - 2. 0.003 cfm/sq. ft. air infiltration at static-air-pressure difference of 12.00 lbf/sq. ft (575 Pa).
- E. Wall Panel Water Penetration Static Pressure, ASTM E331: No uncontrolled water penetration at a static pressure of 20.00 lbf/sq. ft. (958 Pa).

F. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

#### 2.03 FORMED METAL WALL PANELS

- A. Ribbed-Profile, Concealed Fastener Metal Wall Panels: Structural metal panels consisting of formed metal sheet with fastener leg for concealed attachment to wall framing.
  - 1. Basis of Design: MBCI, MasterLine 16 Panel.
  - Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, structural quality, Grade 50, Coating Class AZ50 pre-painted by the coil-coating process per ASTM A755/A755M.
    - a. Nominal Thickness: 22 gauge coated thickness, with smooth surface.
      - 1) Exterior Finish: Fluoropolymer two-coat system. Signature 300
      - 2) Color: As selected by Architect from manufacturer's standard colors
  - 3. Panel Width: 16 inches (406 mm).
  - 4. Panel Thickness: 7/8 inch (22 mm).

#### 2.04 MISCELLANEOUS MATERIALS & ACCESSORIES

- A. General: Provide complete metal panel assemblies incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings. Provide required fasteners, closure strips, and sealants as indicated in manufacturer's written instructions.
- B. Sub-framing Z-girts:
  - 1. Z-type furring channel as recommended by thermal spacer and metal panel manufacturers.
    - a. Galvanized, provide size and gauge for attachment of metal wall panels, coordinate with all trades for placement of fastening requirements per applicable codes.
- C. Sub-framing Thermal Spacer: 100% Pultruded glass fiber and thermoset polyester resin insulation clip.
  - 1. Thermal spacer thickness for top, base and web: 4.8 mm nominal.

- 2. Thermal spacer depth depth: 3.5 inches
- 3. Basis of Design; Cascadia Windows Inc., Cascadia Clip.
- 4. Spacer Fasteners: High hex head washer head with sharp twin lead threaded design of heat treated corrosion resistant coated steel.
  - a. Fastener for steel framing acceptable material: Equal to LeLand Industries Inc, Master Gripper with DT2000 coating.
- D. Flashing and Trim: Match material, thickness, and finish of metal panels.
- E. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by metal panel manufacturer. Where exposed fasteners cannot be avoided, supply corrosion-resistant fasteners with heads matching color of metal panels by means of factory-applied coating, with weathertight resilient washers.

## F. Panel Sealants:

- 1. VOC Content of Interior Sealants: Sealants used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - a. Architectural Sealants: 250 g/L.
- 2. Concealed Joint Sealant: Non-curing butyl, AAMA 809.2.
- 3. Elastomeric Joint Sealant: Urethane sealant, single-component, ASTM C920 Type S, Grade NS, Class 25, Use NT, A, M, G, O.
- 4. Tape Mastic: Manufacturer's standard butyl type.

### 2.05 FABRICATION

- A. General: Provide factory fabricated and finished metal panels, trim, and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings.

#### 2.06 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 0.3 mil primer with 0.7 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621[, meeting solar reflectance index

requirements].

1. Basis of Design: MBCI, Signature 300.

## PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Examine metal panel system substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.
  - Inspect framing that will support insulated metal panels to determine if support
    components are installed as indicated on approved shop drawings and are within
    tolerances acceptable to metal panel manufacturer and installer. Confirm presence
    of acceptable framing members at recommended spacing to match installation
    requirements of metal panels.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal panel installation.

## 3.02 METAL PANEL INSTALLATION

- A. Concealed-Fastener Formed Metal Panels: Install metal panel system in accordance with manufacturer's written instructions, approved shop drawings, project drawings, and referenced publications. Install metal panels in orientation, sizes, and locations indicated. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Fasten metal panels to supports with fasteners at each location indicated on approved shop drawings, at spacing and with fasteners recommended by manufacturer. Fasten panel to support structure through leading flange. Snap-fit back flange of subsequent panel into secured flange of previous panel.
  - 1. Cut panels in field where required using manufacturer's recommended methods.
  - 2. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by metal panel manufacturer.
- C. Attach panel flashing trim pieces to supports using recommended fasteners and joint sealers.
- D. Joint Sealers: Install liquid sealants where indicated and where required for weatherproof performance of metal panel assemblies.

- 1. Seal panel base assembly, openings, panel head joints, and perimeter joints using joint sealers indicated in manufacturer's instructions.
- 2. Seal perimeter joints between window and door openings and adjacent panels using elastomeric joint sealer.
- 3. Prepare joints and apply sealants per requirements of Division 07 Section "Joint Sealants."

## 3.03 ACCESSORY INSTALLATION

- A. General: Install metal panel accessories with positive anchorage to building and weather tight mounting; provide for thermal expansion. Coordinate installation with flashings and other components.
  - 1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
  - 2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
  - 3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.
- B. Sub-framing: Ensure thermal spacer type is selected to accommodate orientation of vertical and horizontal sub-framing. Install thermal spacers in accordance with spacer manufacturer's written recommendations. Clip thermal spacer to z-girt and fasten girt directly to metal stud wall framing as directed by cladding manufacturer.
- C. Installation sequence for spacers, sub-framing, and insulation:
  - 1. Pre-punch or pre-drill holes in Z-girts and tracks to accommodate fasteners.
  - 2. Position Z-girts directly over thermal spacer before installation of fasteners.
  - 3. Completely install spacers, screws and sub-framing, prior to installing insulation.
  - 4. Friction fit insulation in place as follows:
    - a. For semi-rigid insulation batts or boards, score or cut insulation down its centerline to 50 % maximum of its depth to enable fitting insulation in correct position.
    - b. Fold edges of insulation board back to enable friction fitting in correct position. Position edges of partially folded board into space between girts and thermal spacers, and flatten partially folded board against substrate.

- c. Ensure insulation is tightly fitted with sides of insulation slightly compressed at each insulation spacer.
- 5. Install corrosion resistant stick pins or other mechanical insulation retention devices 400 mm maximum on center along centerline of insulation batts or boards and in accordance with insulation manufacturer's written recommendations.
  - a. Use sufficient number of stick pins or retention devices to ensure insulation remains flat and in correct position.
  - b. Use 3 minimum stick pins or retention devices for each 1.2 m long batt or board.
- 6. Ensure insulation pieces are in contact with no linear gaps between spacers.

## 3.04 FIELD QUALITY CONTROL

- A. Roofing/Wall Consulting Services:
  - 1. The Contractor shall engage the services of a Professional Roof Consultant. The Consultant must be listed as a Professional Member of the International Institute of Building Enclousre Consultants (IIBEC) and provide a certificate of adequate error and omissions insurance. The Consultant shall attend the pre-roofing/wall meeting and perform no less than three (3) inspections during the installation of the new metal wall panel system(s) at each building (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 job progress and any deficiencies noted during the inspections. Upon completion of all punch list items, the Roof Consultant shall provide a letter of certification to the Architect/Owner stating the new wall systems has been installed per the requirements of the contract documents, manufacturer's requirements, and all warranty requirements.
  - 2. Pre-approved Roof Consultants:
    - a. Williamson & Associates, Inc.

Alex Murray

5120 Roswell Road

Suite 100 South

Atlanta, Georgia 30342

(404) 256-2388

b. Smith Seckman Reid, Inc.

Michael Spach

2995 Sidco Drive

Nashville, TN 37204

(615) 460-0596

c. Nashville Roof Consultants

James R. Oldham

1411 Winding Way Road

Nashville, TN 37216

(615) 238-5737

3. Note: Non-specified Roof Consulting firms must be pre-approved by the Architect . Request for a substituting firm must be submitted "in writing" 5 (five) days prior to the bid opening.

## 3.05 CLEANING AND PROTECTION

- A. Clean finished surfaces as recommended by metal panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

## **END OF SECTION 07 4213**

#### SECTION 07 4293 - METAL SOFFIT PANELS

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

A. Flush-profile, concealed fastener, lap-seam metal soffit panels, with related metal trim and accessories.

## 1.02 RELATED REQUIREMENTS:

- A. Division 05 Section "Structural Steel Framing" for steel framing supporting metal panels.
- B. Division 05 Section "Cold-Formed Metal Framing" for cold-formed metal framing supporting metal panels.
- C. Division 07 Section "Metal Roof Panels" for metal roof panels installed with metal soffit and liner panel
- D. Division 07 Section "Sheet Metal Flashing and Trim" for sheet metal flashing items in addition to items specified in this Section.
- E. Division 13 Section "Metal Building Systems" for steel framing supporting metal panels.

#### 1.03 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org <a href="http://www.aamanet.org">http://www.aamanet.org</a>:
  - 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 <a href="http://www.asce.org/codes-standards">http://www.asce.org/codes-standards</a>:
  - 1. ASCE 7 Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): www.astm.org <a href="http://www.astm.org">http://www.astm.org</a>:
  - 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 <a href="http://www.mbci.com/guide\_specs/Joint Sealants.doc">http://www.mbci.com/guide\_specs/Joint Sealants.doc</a>.
- 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 E1592 Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
- D. International Accreditation Service (IAS):
  - IAS AC472 Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems,

## 1.04 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer accredited under IAS AC472, Part B.
- B. Installer Qualifications: Experienced Installer [certified by metal panel manufacturer] with minimum of 15 years experience with successfully completed projects of a similar nature and scope.
  - 1. Installer's Field Supervisor: Experienced mechanic [certified by metal panel manufacturer] supervising work on site whenever work is underway.
- C. Steel Construction Publications: Comply with published recommendations in the following:
  - 1. American Institute of Steel Construction (AISC): "Steel Construction Manual."
  - 2. American Iron and Steel Institute (AISI): "Cold Formed Steel Design Manual."

## 1.05 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, metal panel installer, metal panel manufacturer's technical representative, inspection agency and related trade contractors.
  - 1. Coordinate building framing in relation to metal panel system.

- 2. Coordinate openings and penetrations of metal panel system.
- 3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

#### 1.06 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets for specified products. Include data indicating compliance with performance requirements.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, and special details. Make distinctions between factory and field assembled work.
  - 1. Indicate points of supporting structure that must coordinate with metal panel system installation.
  - 2. Include structural data indicating compliance with performance requirements and requirements of local authorities having jurisdiction.
- C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.
- E. Samples of all Warranties.

# 1.07 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicating compliance of products with requirements.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC472 Part B.
- D. Buy American Certification: Manufacturers' letters of compliance acceptable to authorities having jurisdiction, indicating that products comply with requirements.
- E. Manufacturer's warranty: Unexecuted sample copy of manufacturer's warranty.

#### 1.08 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.

## 1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
  - 1. Deliver, unload, store, and erect metal panels and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
  - 2. Store in accordance with Manufacturer's written instruction. Provide wood collars for stacking and handling in the field.

#### 1.10 WARRANTY

- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within [15] years from date of Final Completion.
- B. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within the warranty period, as follows:
  - 1. Fluoropolymer Two-Coat System:
  - 2. Basis of Design System: MBCI, Signature 300.
  - 3. Color fading in excess of 5 Hunter units per ASTM D2244.
  - 4. Chalking in excess of No. 8 rating per ASTM D4214.
  - 5. Failure of adhesion, peeling, checking, or cracking.
  - 6. Warranty Period: [25] years from date of Final Completion.

## PART 2 PRODUCTS

## 2.01 MANUFACTURER:

A. Basis of Design Manufacturer: MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.; Houston TX. Tel: (877)713-6224; Email: info@ecoficientseries.com

<mailto:info@ecoficientseries.com>; Web: www.mbci.com <a href="http://www.mbci.com">http://www.mbci.com</a>.

- 1. Provide basis of design product[, or comparable product approved by Architect prior to bid.
- 2. ATAS International
- 3. Petersen Aluminum Corporation
- 4. Morin, a Kingspan Group Company
- 5. Merchant & Evans
- 6. Dimensional Metals, Inc.
- 7. ATAS International
- 8. Berridge Manufacturing Co.

## 2.02 PERFORMANCE REQUIREMENTS

- A. General: Provide metal panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated, as determined by ASTM E1592:
  - 1. pressure, importance factor, exposure category, and basic wind speed indicated on drawings.
  - 2. Wind Negative Pressure: Certify capacity of metal panels by actual testing of proposed assembly.
    - a. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/120 of the span with no evidence of failure.
    - b. Seismic Performance: Comply with ASCE 7 Sections 9, "Earthquake Loads."
- C. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

## 2.03 FORMED METAL [SOFFIT] [AND] [LINER] PANELS

- A. Flush-Profile, Concealed Fastener Metal [Soffit] [and] [Liner] Panels: Metal panels consisting of formed metal sheet with vertical panel edges, with flush joints between panels, field assembled with nested lapped edges, and attached to supports using concealed fasteners.
  - 1. Basis of Design: MBCI, Artisan Series Panels.
  - 2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), prepainted by the coil-coating process per ASTM A755/A755M.
  - 3. Nominal Thickness: [24 gage] coated thickness, with [smooth] surface.
    - a. Exterior Finish: [Fluoropolymer two-coat system]
    - b. Color: [Match Architect's custom color].
      - 1) Panel Width: [12 inches (305 mm)].
      - 2) Panel Thickness: 1 inch (25 mm).

## 2.04 MISCELLANEOUS MATERIALS

- A. General: Provide complete metal panel assemblies incorporating trim, fasciae, and miscellaneous flashings. Provide required fasteners, closure strips, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panels.
- C. Fasteners: Self-tapping screws and other acceptable fasteners recommended by metal panel manufacturer. Where exposed fasteners cannot be avoided, supply corrosionresistant fasteners with heads matching color of metal panels by means of factoryapplied coating, with weathertight resilient washers.

## 2.05 FABRICATION

- A. General: Provide factory fabricated and finished metal panels, trim, and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings.

#### 2.06 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 0.3 mil primer with 0.7 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621[, meeting solar reflectance index requirements].
  - 1. Basis of Design: MBCI, Signature 300.

## PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Examine metal panel system substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.
  - Inspect framing that will support insulated metal panels to determine if support
    components are installed as indicated on approved shop drawings and are within
    tolerances acceptable to metal panel manufacturer and installer. Confirm presence
    of acceptable framing members at recommended spacing to match installation
    requirements of metal panels.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal panel installation.

#### 3.02 METAL PANEL INSTALLATION

- A. Concealed-Fastener Formed Metal Soffit Panels: Install metal panel system in accordance with manufacturer's written instructions, approved shop drawings, project drawings, and referenced publications. Install metal panels in orientation, sizes, and locations indicated. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Fasten metal panels to supports with fasteners at each location indicated on approved shop drawings, at spacing and with fasteners recommended by manufacturer. Fasten panel to support structure through leading panel flange. Fit back flange of subsequent panel into secured flange of previous panel.
  - 1. Cut panels in field where required using manufacturer's recommended methods.
  - 2. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by metal panel manufacturer.

C. Attach panel flashing trim pieces to supports using recommended fasteners.

## 3.03 ACCESSORY INSTALLATION

- A. General: Install metal panel accessories with positive anchorage to building and weather tight mounting; provide for thermal expansion. Coordinate installation with flashings and other components.
  - 1. Install components required for a complete metal panel assembly, including trim, flashings, sealants, closure strips, and similar items.
  - 2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
  - 3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.

## 3.04 CLEANING AND PROTECTION

- A. Clean finished surfaces as recommended by metal panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

## 3.05 FIELD QUALITY CONTROL

- A. The Contractor shall engage the services of a Professional Roof CONSULTANT. The Consultant must be listed as a Professional Member of the International Institute of Building Enclosure Consultants (IIBEC) and provide a certificate of adequate error and omissions insurance. The Consultant shall attend the pre-roof meeting and perform no less than three (3) inspections during the installation of the new metal soffit systems at each building (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 job progress and any deficiencies noted during the inspections. Upon completion of all punch list items, the Roof Consultant shall provide a letter of certification to the Architect / Owner stating the new roof system has been installed per the requirements of the contract documents, manufacturer's requirements, and all warranty requirements.
- B. Pre-approved Roof Consultants:
  - 1. Williamson & Associates, Inc.

Alex Murray

5180 ROSWELL ROAD

SUITE 100 SOUTH

Atlanta, Georgia 30342

(404) 256-2388

2. Smith Seckman Reid, Inc.

Michael Spac

2995 Sidco Drive

Nashville, TN 37204

(615) 460-0596

3. Nashville Roof consultants

James R. Oldham

1411 Winding Way Rd.

Nashville, TN 37216

(615) 238-5737

4. NOTE: Non specified Roof consulting firms must be pre-approved by the Architect. Requests for a substituting firm must be submitted "In writing" 5 (five) days prior to the bid opening.

## **END OF SECTION 07 4293**

This page intentionally left blank

### SECTION 07 4313 - LINEAR METAL CEILING SYSTEM

## PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

#### A. Section Includes:

- 1. Perforated and non-perforated metal ceiling panels
- 2. Suspension systems
- 3. Accessories; provide other necessary items including devices for attachment overhead construction, secondary members, splines, splices, connecting clips, wall connectors, wall angles, and other devices required for a complete installation.
- 4. Supplemental support framing: Provide fully engineered secondary framing as required to meet code, conforming to layout shown in drawings, to support direct-hung metal ceilings suspension system.

### B. Related Sections / Work:

- 1. Sections 05 40 00 Cold-Formed Metal Framing
- 2. Sections 09 20 00 Plaster and Gypsum Board
- 3. Sections 09 50 00 Acoustical Ceilings
- 4. Sections 09 90 00 Paintings and Coatings
- 5. Division 23 Heating, Ventilating and Air Conditioning
- 6. Division 26 Electrical
- C. This Section covers the general requirements only for Acoustical Metal Ceilings as shown on the drawings. The supplying and installation of additional accessory features and other items not specifically mentioned herein, but which are necessary to make a complete installation, shall also be included or clarified accordingly.

## D. Qualification Data:

1. Test Reports: Certified reports from independent agency substantiating structural compliance to windloads and other governing requirements.

## 2. Certificates:

- a. Data substantiating manufacturer and installer qualifications.
- b. Certified data attesting fire rated materials comply with specifications.
- 3. Manufacturer's Instructions: Detailed installation instructions and maintenance data.

#### 1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
  - 1. E 84 "Standard Test Method for Surface Burning Characteristics of Building Materials"
  - 2. E 488 "Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements"
  - 3. B 209 "Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate"
  - 4. C 423 "Sound Absorption and Sound Absorption Coefficients by Reverberation Room Method"
  - 5. E 580 "Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Moderate Seismic Restraint"
  - 6. C 635 "Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings"
  - 7. C 636 "Recommended Practice for Installation of Metal Ceiling Suspensions Systems for Acoustical and Lay-in Panels"
  - 8. A 641 "Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire"
  - 9. A 653 "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip process"
  - 10. E 1264 "Classification for Acoustical Ceiling Products"
  - 11. E 1477 "Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by use of Integrating-Sphere Reflectometers"

- 12. D 1044 "Practice for Abrasion Resistance"
- 13. D 1002 "Practice for Adhesion Resistance"

#### 1.04 SUBMITTALS

- A. Product Data: Manufacturer's published literature, including specifications.
- B. Product Certification: Manufacturer's certifications that products comply with specified requirements and governing codes including product data, laboratory test reports and research reports showing compliance with specified standards.
- C. Shop Drawings: Submit shop drawings for reflected ceiling plans (RCP's), drawn to scale, and indicating penetrations and ceiling mounted items. Show the following details:
  - 1. Reflected Ceiling Plan(s): Indicating metal ceiling layout, ceiling mounted items and penetrations.
  - 2. Suspension System, Carrier and Component Layout.
  - 3. Details of system assembly and connections to building components.
- D. Shop Drawings: Submit shop drawings of supplemental support framing system signed and seal by a professional engineer registered in the State of Alabama.
- E. Samples for Verification: Full-size units (or as specified below) of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics. Submit samples for each type specified.
  - 1. 11" square metal panel units.
  - 2. 11" long samples of each exposed molding or trim.
  - 3. 11" long samples of each suspension component.

# 1.05 QUALITY ASSURANCE

- A. Manufacturer/Installer Qualifications:
  - 1. Provide metal ceiling system components produced by a single manufacturer with a minimum 5 years' experience in actual production of specified products and with resources to provide consistent quality in appearance and physical properties, without delaying the work.

- 2. Provide suspension system components produced by a single manufacturer to provide compatible components for a complete metal ceiling system installation.
- 3. Perform installations using a firm with installers having no less than 3 years of successful experience on projects of similar size and requirements.

## B. Regulatory Requirements:

- 1. Fire Rating Performance Characteristics: Install system to provide a flame spread of 0 25, complying with certified testing to ASTM E 84.
- 2. Structural Criteria: Install and certify system to comply with structural and wind load requirements of governing codes.
- 3. Installation Standard for Suspension System: Comply with ASTM C 636.
- 4. Miami-Dade County, Florida Notice of Acceptance No. 14-1222.04
- C. Mock-Up: Prior to beginning installation erect a mock-up section, where directed, using all system components.
- D. Pre-installation Conference: Conduct a conference, prior to start of installation, to review system requirements, shop drawings, and all coordination needs.

## 1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver system components in manufacturer's original unopened packages, clearly labeled.
- B. Store components in fully enclosed dry space. Carefully place on skids, to prevent damage from moisture and other construction activities.
- C. Handle components to prevent damage to surfaces and edges, and to prevent distortion and other physical damage.

## 1.07 PROJECT CONDITIONS

- A. Begin system installations only after spaces are enclosed and weather-tight, and after all wet work and overhead work have been completed.
- B. Prior to starting installations, allow materials to reach ambient room temperature and humidity intended to be maintained for occupancy.

## 1.08 WARRANTY

A. Provide specified manufacturer's warranty against defects in workmanship, discoloration, or other defect.

- B. Provide warranty against defects in workmanship for a minimum period of (5) years from date of substantial completion.
- C. Provide panel finish warranty in which manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish with the warranty period, as follows:
  - 1. Color fading
  - 2. Chalking
  - 3. Failure of adhesion, peeling, checking, or cracking
  - 4. Warranty period: 20 years from date of Substantial Completion.

## 1.09 MAINTENANCE & EXTRA MATERIALS

- A. Maintenance Instructions: Provide manufacturer's standard maintenance and cleaning instructions for finishes provided.
- B. Extra Materials: Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents. Only typical system components are included with attic stock.
  - 1. Acoustical Metal Ceiling Pan Units: Full-size units equal to two percent (2%) of amount installed.
  - 2. Ceiling Suspension System Components: Quantity of each grid and exposed component equal to two percent (2%) of amount installed.

## **PART 2 PRODUCTS**

### 2.01 MANUFACTURER

A. Provide "Hunter Douglas Multi-Box Continuous Linear Metal" ceiling system as manufactured by Hunter Douglas Architectural, Inc., 5015 Oakbrook Parkway, Suite 100, Norcross, GA 30093, USA. (800) 366-4327 or Equal Product

## 2.02 SYSTEM MATERIALS

- A. Linear metal panel ceiling system for interior installations:
- B. Panel Profile Type: An array selected from the Box Series and Deep Box Series profiles, untilizing Universal Carrier. Formed linear aluminum panels with square edges; thickness per manufacturer recommendation.
- C. Linear Suspension System:

- 1. Carrier: Universal hat-shaped, .038" roll-formed alumnium section with hook-shaped tabs spaced to receive ceiling panels at 2" on center and 27/32" apart. Support holes 4" on center. Flnish: Factory-applied black enamel.
- 2. Hanger Wire: 12 Ga. galvanized carbon steel.
- 3. Seismic/Wind Uplift Compression Struts: Verify and insert proper sizes required to comply with governing codes, as designed by professional structural engineer registered in the State of Alabama
- D. Panel Finish: Paint; color to be selected by architect
  - 1. Decorated Wood-Look Powder Coat
- E. Closure between panels: No closure.

## 2.03 ACCESSORY MATERIALS

- A. Panel End Caps: Formed, stamped or milled end caps with matching finish,
- B. Panel Splice: Formed aluminum insert designed to snap-fit between ends of two ceiling panels. Finish to match panel.
- C. Air Distribution Devices: Provide distribution devices that are independently suspended, relocatable, adjustable from below finished ceiling, and capable of being concealed behind (invisible to view) and fully integrated with ceiling system so as to allow no interruption of ceiling components.
- D. Lighting Fixtures: Provide fixtures capable of being fully integrated with ceiling system and requiring no interruption of ceiling components, that are independently suspended, and as selected to conform to lighting criteria specified in Division 16.
- E. Acoustic Material:
  - 1. Refer to section 07 2129 Sprayed Insulation

## **PART 3- EXECUTION**

## 3.01 EXAMINATION

- A. Examine substrates and structural framing to which acoustical metal panels attach or abut, with installer present, for compliance with requirements specified in this and other Sections that affect installation and anchorage, and other conditions affecting performance of metal panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.02 PREPARATION

- A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
- B. Measure each ceiling area and establish layout of acoustical metal pan units to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width units at borders, and comply with layout shown on reflected ceiling plans.
- C. Survey substrate for wall attachment to assure squareness and proper elevation for wall panel installation.

#### 3.03 INSTALLATION

- A. General: Install acoustical metal pan ceilings, per manufacturers shop drawings provided, per manufacturer's written instructions and to comply with publications referenced below.
  - 1. CISCA "Ceiling Systems Handbook"
  - 2. Standard for Ceiling Suspension System Installations ASTM C 636
  - Standard for Ceiling Suspension Systems Requiring Seismic Restraint ASTM E 580
  - 4. IBC (International Building Code) Standard for Seismic Zone for local area
- B. Suspend ceiling hangers from building's approved structural substrates and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.
  - 3. Where width of ducts and other construction within ceiling plenum produce hanger spacings that interfere with location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Utilize supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
  - 4. Where used secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are

- appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
- 5. Space hangers not more than 48" on-center, along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 12" from ends of each member. Supply supporting calculations from licensed Structural Engineer verifying hanger spacing meets all requirements, when spacing exceeds those recommended.
- 6. Level grid to 1/8" in 10' from specified elevation(s), square and true.
- 7. Adjust suspension system runners so they are square (within .5 degree from 90 degrees) and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- C. Secure bracing wires to ceiling suspension members and to supports acceptable to Architect/Engineer and/or inspector. Suspend bracing from building's structural members and/or structural deck, as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs (unless directed otherwise).
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical metal pan. Method of edge trim attachment and design of edge trims to be approved by Architect.
  - 1. Screw attach moldings to substrate at intervals not more than 18" on-center and not more than 6" from ends, leveling with ceding suspension system to a tolerance of 1/8" in 10'. Miter corners accurately and connect securely.
  - 2. Do not use exposed fasteners, including pop rivets, on moldings and trim without prior written approval, or unless detailed otherwise.
- E. Scribe and cut acoustical metal panel units for accurate fit at penetrations by other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher-leveled metal sheet.
- F. Install acoustical metal panel units in coordination with suspension system. Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating ceiling.

## 3.04 ADJUST AND CLEAN

- A. Adjust components to provide uniform tolerances.
- B. Replace all ceiling panels that are scratched, dented or otherwise damaged.

C. Clean exposed surfaces with non-solvent, non-abrasive commercial type cleaner.

# END OF SECTION 07 4313

This page intentionally left blank

#### SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, sheet metal roofing, \_\_\_\_\_\_, and other items indicated in Schedule.
- B. Sealants for joints within sheet metal fabrications.

# 1.02 RELATED REQUIREMENTS

Section 06 1000 - Rough Carpentry: Wood nailers for sheet metal work.

- A. Section 07 7200 Roof Accessories: Manufactured metal roof curbs.
- B. Section 07 4113 Metal Roof Panels
- C. Section 07 4213 Ribbed Metal Wall Panels
- D. Section 07 9200 Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

## 1.03 REFERENCE STANDARDS

- A. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- B. ASTM C920 Standard Specification for Elastomeric Joint Sealants; 2014.
- C. ASTM D4586/D4586M Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- D. CDA A4050 Copper in Architecture Handbook; current edition.
- E. SMACNA (ASMM) Architectural Sheet Metal Manual; 2012.

# 1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

## 1.05 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Samples: Submit two samples 6 by 6 inch (152.4 by 152.4 mm) in size illustrating metal finish color.

## 1.06 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.
- C. The Contractor shall engage the services of a Professional Roof Consultant. The Consultant must be listed as a Professional Member of the International Institute of Buildin gEnclousre Consultants (IIBEC) and provide a certificate fo adequate error and omissions insurance. The Consultant shall attend the pre-roofing meeting and perform no less than three (3) inspections during the installation of the new metal roof systems at each building (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 job progress and any deficiencies noted during the inspections. Upon completion of all punch list items, the Roof Consultant shall provide a letter of certification to the ARchtiect/Owner stating the new wall/roof system has been installed per the requirements of the contract documents, manufacturer's requirements, and all warranty requirements.
- D. Approved roofing consultants include the following:
  - 1. Williamson & Associates, Inc.

Alex Murray

5120 Roswell Road

Suite 100 South

Atlanta, Georgia 30342

(404) 256-2388

2. Smith Sckman Reid, Inc.

Michael Spach

2995 Sidco Drive

Nashville, TN 37204

(615) 460-0596

3. Nashville Roof Consultants

James R. Oldham

1411 Winding Way Road

Nashville, TN 37216

(615) 238-5737

4. NOTE: Roof consulting firms not listed above must be pre-approved by the Architect. Requests for a substituting firm must be submitted "in writing" 5 (10) days prior to the bid opening and be added "as approved" by addendum.

## 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

#### PART 2 PRODUCTS

#### 2.01 SHEET MATERIALS

- A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch (0.6 mm) thick base metal, shop pre-coated with PVDF coating 24 Guage.
  - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
  - 2. Provide written verification from roof membrane manufacturer that sheet metal is compatable with roofing membrane.
  - 3. Color: As selected by Architect from manufacturer's standard colors.
- B. PVC Coated Galvanized Steel: 24 Guage; Use wherever PVC membrane laps or is attached to metal flasshing for full warranty requirements.

## 2.02 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers.
- B. Primer: Zinc chromate type.

- C. Protective Backing Paint: Zinc molybdate alkyd.
- D. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
- E. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.
- F. Plastic Cement: ASTM D4586, Type I.
- G. Terimination Bar: 304 Stainless Steel, 0.125 inch thick x 1" x 10'-0" with beveled edge for reciept of sealant. Set in full bed of sealant. Provide stainless steel fastners and stainless steel washers as required at six inches (6") O.C. Install per the requirements of roofing manufacturer.

#### 2.03 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.
- F. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

### PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

## 3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

## 3.03 INSTALLATION

- A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Secure gutters and downspouts in place with concealed fasteners.

DDO IECT DOOFING WADDANTY

PROJECT ROOFING WARRANTY		
NAME OF PROJECT:		
LOCATION:		
ADDRESS:		
	DATE OF EXPIRATION	

- A. 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 MANUFACTURER RECOMMENDATIONS.
- B. 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 MATERIAL 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 WATER TIGHT 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 FINAL ACCEPTANCE OF THE PROJECT. THIS GUARANTEE DOES NOT 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.

C. 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

RECOMMENDATIONS 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 FLASHING 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 WATERTIGHT CONDITIONS, AND FURTHER, TO RESPOND ON OR WITHIN THREE (3) CALENDAR DAYS UPON PROPER NOTIFICATION OF LEAKS OR DEFECTS BY THE OWNER.

- 1. 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.
- D. DURING THE GUARANTEE PERIOD, IF THE OWNER ALLOWS ALTERATION OF THE WORK BY ANYONE OTHER 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 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.

END OF SECTION 07 6200

- 1. 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.
- E. 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.
- F. 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 WITNES		F, THIS INSTRU DAY OF		EEN DULY EXECUTI	ED
Genera	al Contractor	's Authorized Sig	gnature		_
Typed	Name and Ti	tle			_
Notary	Public				_

#### SECTION 07 6500 - WALL FLASHING

## PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.
- B. Section 04 2000 Unit Masonry
- C. Section 07 2500 Weather Barriers, includes transiton membrane.
- D. Section 07 6000 Sheet Metal Flashing and Trim

## 1.02 SUMMARY

- A. Section provides for a flexible rubberized asphalt, self –sealing through-wall flashing and wall flashing, and stainless steel 26 gauge terminations at all dissimilar masonry transitions and general horizontal masonry drainage.
- B. Provide single source manufacturers for Section 07 2500 Weather Barrier, Section 07 6500 Wall Flashing, Termination Bars (refer to 04 2000), and termination bar sealants (refer to 07 9005) as required to ensure compatibly among all products installed as a part of the moisture control assembly at the exterior walls.
  - 1. Where single source cannot be provided, notify architect and provide written verification from manufacturers of all products intended for installation to ensure products from multiple manufacturers are compatible and all specified warranties can be provided and maintained in full force and effect for the entirety of the specified warranty periods for each product.

## 1.03 REFERENCES

- A. American Society for Testing and Materials
  - 1. ASTM E 96 Test Methods for Water Vapor Transmission of Materials.
  - 2. ASTM D 570 Test method for Water Absorption of Plastics.
  - 3. ASTM E 154 Test Method for Water Vapor Retarders used in contract with Earth Under Concrete Slabs, on Walls or as Ground Cover.
  - 4. ASTM D 1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting.

- 5. ASTM D 1938 Test Method for Tear Propagation's Resistance of Plastic Film and Thin Sheeting by a Single-Tear Method.
- 6. ASTM D 1876 Test Method for Peel Resistance of Adhesives.
- 7. ASTM D 1970 Standard Specifications for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- 8. ASTM D 412 Test Methods for Vulcanized Rubber & Thermoplastic Rubbers and Thermoplastic Elastomers Tension.
- 9. ASTM E 2357 Air Barrier Assembly

#### 1.04 SUBMITTALS

- A. Product Data and Shop Drawings: Submit for each product; Spec-Data®/Data Sheets, details and installation procedures.
- B. Test Reports: Indicating compliance with the performance requirements of this section.
- C. Samples of flashing.
- D. Mock-up: Refer to section 04 2000 Unit Masonry.
- E. Pre-installation meeting with Architect, Owner, Owners Waterproofing Consultant, Construction Manager, Window or Storefront Supplier, Masonry Contractor, Flashing Manufacturer, Waterproofing Subcontractor and others associated with the work.

# 1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's recommendations for storage and handling of each product.

#### 1.06 WARRANTY

- A. Standard Product Warranty:
  - 1. Submit manufacturer's 5-year warranty at the end of this section, signed by the authorized General Contractor and the authorized Waterproofing Subcontractor. Date of warranty shall be established as Final Completion date.

## PART 2 PRODUCTS

## 2.01 MATERIALS

- A. Basis of Design Hohmann and Barnard textroflash, 40 mil, self-adhered flexible flashing. Provide mastic, adhesive, primers, seam tapes per manufacturers' instructions and specified warranties.
- B. Equal manufacturers shall be Heckman Building Products and Hohmann & Barnard Inc.- Textroflash, Henry TWF, Tremco Exo-Air TWF, Grace Perma Barrier
- C. Performance Requirements:
  - 1. Water Vapor Transmission: ASTM E 96, Method B-2.9 ng/m2sPa (0.05 perms) maximum.
  - 2. Water Absorption: ASTM D 570 Max 0.1% by weight.
  - 3. Puncture Resistance: ASTM E 154 178 N (40 lbs.)
  - 4. Tear Resistance:
    - a. Initiation ASTM D 1004 min. 58 N (13.0 lbs) M.D.
    - b. Propagation ASTM D 1938 min. 40 N (9.0 lbs) M.D.
  - 5. Lap Adhesion at -4°C (25°F): ASTM D 1876 880 N/M (5.0 lbs./in.) of width
  - 6. Low Temperature Flexibility: ASTM D 1970 Unaffected to -43°C (-45°F).
    - a. Tensile Strength: ASTM D 412, Die C Modified Min. 5.5 MPa (800 psi)
  - 7. Elongation, Ultimate Failure of Rubberized Asphalt: ASTM D 412, Die C Min. 200%.

#### D. Sealant for Termination Bar:

- 1. Provide manufacturers recommended sealant to insure compatibility with Air Barrier product be provided.
- E. Flashing Weeps Mortar Nets, etc. Refer to Section 04 2000 "Unit Masonry" for additional installation requirements.

## F. Termination Bar

1. Stainless Steel Flashing and Special Sections: Provide 26 gauge 304 stainless steel flashing termination strips equal to T-2 termination bar by Holmann and Barnard,

Inc. Refer to flashing detail on drawings.

2. Add sealant at the top of termination bar as recommended by Wall Flashing, Weather Barrier, and Sheet Waterproofing manufacturers.

# G. Metal Drip Edge

- 1. Stainless steel flashing in special sections: provide 26 gauge with hemmed edge No. 304 with premanufactured inside and outside corners. Non-hemmed edges shall extend into wall cavity and turn up at a 45 degree angle for 3/4 inch. (At areas where noted stainless steel flashing shall turn up at a 45 degreee angle and extend to substrate and up to termination bar to support. Front edge shall hem back 3/4". Font edge shall extend beyond brick 1/2". Set metal drip edge in full bed of sealant.
- 2. Refer to Flashing details.
- H. Metal Jamb Flashing: .032 Mill Finish Aluminum L-Shape, size and location as shown on drawings.
- I. Provide single source manufacturers for Section 07 2500 Weather Barrier, Section 07 6500 Wall Flashing, Termination Bars (refer to 04 2000), and termination bar sealants (refer to 07 9005) as required to ensure compatibly among all products installed as a part of the moisture control assembly at the exterior walls.
  - Where single source cannot be provided, notify architect and provide written
    verification from manufacturers of all products intended for installation to ensure
    products from multiple manufacturers are compatible and all specified warranties
    can be provided and maintained in full force and effect for the entirety of the
    specified warranty periods for each product.

## PART 3 EXECUTION

# 3.01 EXAMINATION

A. Examine conditions, with installer present, for compliance with requirements for installation, tolerances and other specific conditions affecting performance of flashing. Remove all deleterious materials from surfaces to be flashed.

# 3.02 INSTALLATION

A. General: Install flashing to dry surfaces at air and surface temperatures of -4°C (25°F) and above in accordance with manufacturer's recommendations at locations indicated on Construction Documents.

B. Flexible Wall Flashing – Referred to on drawings as "Through Wall Flashing" or "Flexible Flashing": All flashing and accessories shall be installed in accordance with manufacturer's printed instructions, contract documents.

## C. Accessories:

- 1. When required by dirty or dusty site conditions or by surfaces having irregular or rough texture, apply surface conditioner by spray, brush, or roller at the rate recommended by manufacturer, prior to flashing installation. Allow surface conditioner to dry completely before flashing application.
- 2. Apply Primer by brush or heavy nap, natural-material roller at rate recommended by manufacturer prior to flashing installation. Allow primer to dry completely before flashing application.
- 3. Provide stainless steel termination bar with a full bed of manufacturer's recommended sealant at the top of all flexible flashing. Refer to drawings for detail.
- 4. Encapsulate stainless steel termination bar with the vapor permeable, fluid applied membrane air barrier per the manufacturer's strict instructions.
- 5. Refer to drawings for details.

# PROJECT WALL FLASHING WARRANTY

NAME OF PROJECT:	
PROJECT LOCATION:	
OWNER:	
GENERAL	CONTRACTOR:
ADDRESS:	
DATE OF ACCEPTANCE:	
DATE OF EXPIRATION:	

- A. The Water Flashing Contractor and the General Contractor do hereby certify that the wall flashing work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved wall flashing manufacturers' recommendations.
- B. The Water Flashing Contractor and the General Contractor do hereby guarantee the wall flashing and associated work including but not limited to all underground vertical and horizontal wall flashing to be water tight 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 Final Acceptance of the project.
- C. Subject to the terms and conditions listed below, the Water Flashing Contractor and the General Contractor also guarantee 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 wall flashing manufacturers' recommendations as are necessary to correct faulty and defective work and/or materials which may develop in the work including. Anticipated life of the wall flashing systems and the best standards applicable to the particular wall flashing type in value and in accordance with construction documents as are necessary to maintain said work in watertight conditions, and further, to respond on or within seven (7) calendar days upon proper notification of leaks or defects by the Owner.

- During the Guarantee Period, if the Owner allows alteration of the work by anyone
  other the Water Flashing Contractor or the General Contractor, including cutting,
  patching and maintenance in connection with penetrations, and positioning of
  anything affected by, this Guarantee shall become null and void upon the date of
  said alterations
- 2. 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 wall flashed areas, and any damage caused by such addition. If this contract is for wall flashing of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing.
- 3. The Owner shall promptly notify the Water Flashing Contractor or the General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the Water Flashing Contractor or 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	·	
Wall Flashing Contractor's Authorized Signatu		Authorized Signatur
Typed Name and Title	Typed Name a	nd Title
Notary Public		

END OF SECTION 07 6500

# SECTION 07 7123 - MANUFACTURED GUTTERS AND DOWNSPOUTS

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Pre-finished galvanized steel gutters and downspouts.
- B. Downspout Boots

# 1.02 RELATED REQUIREMENTS

- A. Section 07 6200 SHEET METAL FLASHING AND TRIM.
- B. Section 33 4112 Connection of Downspouts to Storm Sewer.
- C. Section 07 4113 Metal Roof Panel

#### 1.03 REFERENCE STANDARDS

- A. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels: 2013.
- B. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM D4479/D4479M Standard Specification for Asphalt Roof Coatings Asbestos-Free; 2007 (Reapproved 2012).
- D. SMACNA (ASMM) Architectural Sheet Metal Manual; 2012.

# 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Conform to SMACNA (ASMM) for sizing components for rainfall intensity determined by a storm occurrence of 1 in 10 years.
- B. Conform to applicable code for size and method of rain water discharge.
- C. Maintain one copy of each document on site.
- D. Provide calculations of gutter and downspout sizing for building prior to fabrication for architects approval.

#### 1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
- C. Samples: Submit two samples, 12 inch (\_\_\_\_ mm) long illustrating component design, finish, color, and configuration.

# 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
- B. Prevent contact with materials that could cause discoloration, staining, or damage.

## 1.07 WARRANTIES:

- A. Provide 5 year Workmanship Warranty on manufacturer's warranty form with no monetary limitation where the contractor agrees to repair or replace components in the roofing system, which cause a leak due to a failure in workmanship.
- B. Manufacturer's finish warranty:
  - 1. Covering bare metal against rupture, structural failure and perforation due to normal atmospheric corrosion exposure.
  - 2. Covering panel finish against cracking, checking, blistering, peeling, flaking, chipping, chalking and fading.
  - 3. Duration: twenty (20) years

## PART 2 PRODUCTS

# 2.01 MANUFACTURERS

- A. Gutters and Downspouts:
  - 1. ATAS International, Inc; Water Control: www.atas.com/#sle.
  - 2. Cheney Flashing Company; \_\_\_\_: www.cheneyflashing.com/#sle.
  - 3. SAF Perimeter Systems, a division of Southern Aluminum Finishing Company, Inc; \_\_\_\_: www.saf.com/persys/#sle.
  - 4. W.P. Hickman Company; Wind Resistant Gutter: www.wph.com.
  - 5. Substitutions: See Section 01 6000 Product Requirements.

#### 2.02 MATERIALS

- A. Pre-Finished Galvanized Steel Sheet: ASTM A 653/A 653M, 24 gauge with G90/Z275 zinc coating; minimum 0.02 inch (0.6 mm) thick base metal.
  - 1. Finish: Shop pre-coated with PVDF (polyvinylidene fluoride) coating.
  - 2. Color: To match Metal Roof Panels.
- B. Protective Backing Paint: Asphaltic mastic ASTM D 4479 Type I.

#### 2.03 COMPONENTS

- A. Gutters: Profile as indicated on drawings, size per manufacturer's design calculations.
- B. Downspouts: SMACNA Rectangular profile, size per manufacturer's design calculations.
- C. Anchors and Supports: Profiled to suit gutters and downspouts.
  - 1. Anchoring Devices: In accordance with SMACNA requirements.
  - 2. Gutter Supports: Brackets.
  - 3. Downspout Supports: Brackets.
- D. Fasteners: Same material and finish as gutters and downspouts, with soft neoprene washers.

## 2.04 ACCESSORIES

- A. Downspout Boots: Cast iron; ASTM A48.
  - 1. Manufacturer: Basis of Design J.R. Hoe. Equal to A Series with clean out and neoprene gasketing.
  - 2. Provide sizes as required to coordinate with downspout size and storm drainage piping size & elevation. Refer to civil and architectural drawings for location.
  - 3. Paint all down spout boots. Color as selected by Architect.

# 2.05 FABRICATION

- A. The general contractor shall provide calculations for project location and roof configuration per all applicable codes to size the downspouts and gutters. Submit calculations and shop drawings for approval.
- B. Form gutters profiles indicated on the drawings.

- C. Form downspouts as follows:
  - 1. Size: rectangular
  - 2. Profile: As indicated on drawings, construct per SMACNA.
- D. Fabricate with required connection pieces.
- E. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- F. Hem exposed edges of metal.
- G. Fabricate gutter and downspout accessories; seal watertight.

## 2.06 FINISHES

A. Fluoropolymer Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard colors and as approved in writing by Owner & Architect.

## PART 3 EXECUTION

# 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that surfaces are ready to receive work.

## 3.02 PREPARATION

A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

#### 3.03 INSTALLATION

- A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.
- B. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.
- C. Connect downspouts to downspout boots at 8 inches above grade or as recommended by manufacturer, coordinate in field with Architect prior to installation. Allow downspout to enter boot and provide venting around downspout to prevent vacuum seal.

- D. Provide exspansion joints per SMACNA.
- E. Provide brake metal between disimilar metals.

# END OF SECTION 07 7123

This page intentionally left blank

#### **SECTION 07 8401 - FIRESTOPPING**

## PART 1 – GENERAL

This Specification is written using Hilti as a specification and design basis. It is not intended to limit manufacturers. The following manufacturers: 3M, Tremco and S.T.I. are approved for bidding purposes, however must submit for approval systems and products that are equal to the specified Hilti products. These submittals must be approved by the General Contractor's Firestopping Consultant, the General Contractor and the Architect prior to incorporation into the project.

## 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Section, apply to work specified in this section.

## 1.02 DEFINITIONS

A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in/joints between fire rated wall and floor assemblies. Comply with all Governing Agencies.

## 1.03 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

Only tested firestop systems shall be used in specific locations as follows:

- A. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
- B. Safing slot gaps between edge of floor slabs and curtain walls.
- C. Openings between structurally separate sections of wall or floors.
- D. Gaps between the top of walls and ceilings or roof assemblies.
- E. Expansion joints in walls and floors.
- F. Openings and penetrations in fire-rated partitions or walls containing fire doors.
- G. Openings around structural members which penetrate floors or walls.

# 1.04 RELATED WORK OF OTHER SECTIONS

- A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:
  - 1. Section 03 3000 Cast-In-Place Concrete
  - 2. Section 07 9005 Joint Sealants
  - 3. Section 09 2116 Gypsum Board Assemblies
  - 4. Division 22 Plumbing
  - 5. Division 23 HVAC
  - 6. Division 26 Electrical

# 1.05 REFERENCES

- A. Test Requirements: ASTM E-814, "Standard Method of Fire Tests of Through Penetration Fire Stops"
- B. Test Requirements: UL 1479, "Fire Tests of Through-Penetration Firestops"
- C. Test Requirements:UL 2079, "Tests for Fire Resistance of Building Joint Systems"
- D. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
  - 1. UL Fire Resistance Directory:
    - a. Firestop Devices (XHJI)
    - b. Fire Resistance Ratings (BXRH)
    - c. Through-Penetration Firestop Systems (XHEZ)
    - d. Fill, Voids, or Cavity Material (XHHW)
      - 1) Forming Materials (XHKU)
      - 2) Joint Systems (XHBN)
      - 3) Perimeter Fire Containment Systems (XHDG)
  - 2. Alternate Systems: "Omega Point Laboratories Directory" (updated annually).

- 3. Test Requirements: ASTM E 1966-01, "Standard test method for Fire Resistive Joint Systems"
- 4. Test Requirements: ASTM E 2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus".
- 5. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops."
- 6. ASTM E-84, "Standard Test Method for Surface Burning Characteristics of Building Materials".
- 7. ASTM G 21, "Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi".
- 8. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments
- 9. All applicable building codes: But not limited to the following: IBC.
- 10. NFPA 101 Life Safety Code
- 11. NFPA 70 National Electric Code

# THROUGH-PENETRATION UL CLASSIFICATION SYSTEM

#### FIRE STOPPING SYSTEMS

No Penetrating Items:

Metallic Pipes, Conduit or Tubing:

Non-Metallic Pipe, Conduit or Tubing:

Electric Cables:

Cable, Trays with Electric Cables:

**Insulated Pipes:** 

**Electrical Busduct Penetrations:** 

Mechanical Ductwork Penetrations:

Multiple Penetrations Through Common Openings:

## **Construction Penetration**

- F- Floor Penetration
- W- Wall Penetration
- C Floor or Wall Penetration

# **Type of Construction**

- A Concrete floors equal to or less than 5 inches thick
- B Concrete floors greater than 5 inches thick
- J Concrete or masonry walls equal to or less than 8 inches thick
- K Concrete or masonry walls greater than 8 inches thick
- L Framed Walls

## CONSTRUCTION JOINT UL CLASSIFICATION SYSTEM

# FIRE-RESISTANT JOINT SYSTEMS **SYSTEM**

Capability

**UL CLASSIFICATION** 

Joint	Movement

System

Floor-to-Floor FF D 0000-0999

Joint Width

Wall-to-Wall WW D 0000-0999

Floor-to-Wall FW D 0000-0999

Head of Wall HWD 0000-0999

# **MOVEMENT CAPABILITY**

D= Dynamic S= Static

#### JOINT WIDTH

0000-0999 Less than or equal to 2 inches

1000-1999 Greater than 2 inches less than or equal to 6 inches

2000-2999 Greater than 6 inches less than or equal to 12 inches

# 1.06 QUALITY ASSURANCE

- A. Fire-Test Response Characteristics: Provide through-penetration fire stop systems and fire resistive joint systems that comply with specified requirements of tested systems.
- B. Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
- C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
- D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall provide and consult with an Alabama licensed structural engineer prior to penetrating any load bearing assembly.
- E. For those firestop applications that exist for which no qualified tested system is available through a manufacturer, an engineering judgment derived from similar qualified system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment drawings must follow requirements set forth by the International Firestop Council.

## 1.07 SUBMITTALS

- A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of qualified tested firestop systems to be used and manufacturer's installation instructions to comply with Section 01 3000.
- B. Manufacturer's engineering judgment identification number and document details when no qualified tested system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in document.
- C. Submit material safety data sheets and certificates of compliance provided with product delivered to job-site.

## 1.08 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor

does not in itself confer qualification on the buyer.

B. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in project to a single firestop specialty contractor.

#### 1.09 FIELD SERVICES

- A. Contractor shall provide field services as described below. Field services shall be provided by one of the following groups or entities:
  - 1. Firestopping Manufacturer's Field Representative
  - 2. Third Party Firestopping Consultant approved by the firestopping manufacturer to review and approve firestopping installations.

# B. Description of Field Services:

- 1. During initial installation, firestop manufacturer should be present to assure proper installation/application.
- 2. Upon completion of all firestopping installation, firestop manufacturer shall review firestopping installed on site and provide written verification to the Architect and Owner that all firestopping materials, systems, and installations are in accordance with manufacturer's recommendations and are appropriate for the type of penetration being sealed and the rating of wall in which the penetrations occur.
  - a. Manufacturer's representative shall be present at the project above ceiling inspection. Provide written verification of firestopping installations to Architect within 7 days of above ceiling inspection.

# 1.10 SOLE SOURCE REQUIREMENTS

- A. All fire stopping materials shall be provided from a single manufacturer for all trades.
- B. All firestopping installers shall be approved by the manufacturer as a certified applicator of firestopping materials.

## 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
- B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

- C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.
- D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
- E. Do not use damaged or expired materials.

## 1.12 PROJECT CONDITIONS

- A. Do not use materials that contain flammable solvents.
- B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
- D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet. For non-water resistant firestop materials, protect from exposure to water- firestop materials that are water resistant shall be protected until fully cured.
- E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

# **PART 2 - PRODUCTS**

## 2.01 FIRESTOPPING, GENERAL

- A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- C. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement.

#### 2.02 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with through penetration firestop systems (XHEZ), joint systems (XHBN) and perimeter firestop systems (XHDG) listed in Volume 2 of the URL Fire Resistance Directory; provide products of the following manufacturers as identified below:
  - 1. Hilti, Inc., Tulsa, Oklahoma (Basis of Design)
    - a. 800-879-8000
  - 2. 3M
  - 3. Tremco
  - 4. STI

## 2.03 MATERIALS

- A. Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079, ASTM E 1966, ASTM E 2307 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
- B. Pre-installed firestop devices for use with non-combustible and/or combustible plastic pipe (closed and open systems), conduit, and/or cable bundles penetrating concrete floors, the following products are acceptable:
  - 1. Hilti CP 680P or CP 680M Cast-In Place Firestop Devices:
    - a. Add Aerator adaptor when used in conjunction with aerator ("sovent") system.
    - b. Add metal deck adapter kit if utilizing CP 680P or M on corrugated metal deck.
    - c. Add height extension if utilizing CP 680P or M in concrete slabs thicker than 8".
    - d. Add Hilti Water Module (2" up to 6") to achieve UL W-Rating
    - e. Add Hilti TOP SEAL (1/2" up to 2") to achieve UL W-Rating
  - 2. Hilti Toilet Flange for use with floor outlet water closets.
  - 3. Hilti coupling sleeve for use with floor or general purpose drains.

- C. Pre-installed firestop devices containing built-in self-sealing intumescent inserts for use with data and communication cabling which allow for cable adds or changes without the need to remove or replace any firestop materials, the following product is acceptable:
  - 1. Hilti CP 653 Speed Sleeve
- D. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  - 2. Hilti CP 604 Self-leveling Firestop Sealant
  - 3. Hilti CP 620 Fire Foam
  - 4. Hilti CP 606 Flexible Firestop Sealant
  - 5. Hilti CP 601S Elastomeric Firestop Sealant
- E. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
  - 1. Hilti CP 601S Elastomeric Firestop Sealant
  - 2. Hilti CP 606 Flexible Firestop Sealant
  - 3. Hilti FS-ONE Intumescent Firestop Sealant
- F. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
  - 1. Hilti CP 672 Speed Spray
  - 2. Hilti CP 672 FC "FAST CURE" Speed Spray
  - 3. Hilti CP 601S Elastomeric Firestop Sealant
  - 4. Hilti CP 606 Flexible Firestop Sealant
  - 5. Hilti CP 604 Self-leveling Firestop Sealant
- G. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material. The following products are acceptable:

- 1. Hilti CP 677 Speed Plugs
- 2. Hilti CP 767 Speed Strips
- H. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
- I. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  - 2. Hilti CP 620 Fire Foam
  - 3. Hilti CP 601S Elastomeric Firestop Sealant
  - 4. Hilti CP 606 Flexible Firestop Sealant
- J. Non curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti CP 618 Firestop Putty Stick
  - 2. Hilti CP 658T Firestop Plug
- K. Non curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti CP 618 Firestop Putty Stick
  - 2. Hilti CP 658T Firestop Plug
- L. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
  - 1. Hilti CP 617 Firestop Putty Pad
  - 2. Hilti Firestop Box Insert
  - 3. Hilti FS 657 FIRE BLOCK
- M. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
  - 1. Hilti CP 643 N Firestop Collar

- 2. Hilti CP 644 Firestop Collar
- 3. Hilti CP 648E Endless Wrap Strips
- 4. Hilti CP 648S Single Wrap Strips
- N. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
  - 1. Hilti CP 637 Firestop Mortar
  - 2. Hilti FS 657 FIRE BLOCK
  - 3. Hilti CP 620 Fire Foam
  - 4. Hilti CP 675T Firestop Board
- O. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
  - 1. Hilti FS 657 FIRE BLOCK
  - 2. Hilti CP 675T Firestop Board
- P. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:
  - 1. Hilti CP 672 Speed Spray
  - 2. Hilti CP 601S Elastomeric Firestop Sealant
  - 3. Hilti CP 606 Flexible Firestop Sealant
  - 4. Hilti CP 604 Self-Leveling Firestop Sealant
- Q. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits or cables is expected, the following products are acceptable:
  - 1. Hilti FS 657 FIRE BLOCK
  - 2. Hilti CP 658T Firestop Plug
- R. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

S. Provide a firestop system with an Assembly Rating as determined by UL 2079 or ASTM E 1966 which is equal to the time rating of construction joint assembly.

# **PART 3 - EXECUTION**

#### 3.01 PREPARATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
  - 1. Verify penetrations are properly sized and in suitable condition for application of materials.
  - 2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
  - 3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
  - 4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
  - 5. Do not proceed until unsatisfactory conditions have been corrected.

## 3.02 COORDINATION

- A. Coordinate construction of openings, penetrations and construction joints to ensure that the firestop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes or cut openings to accommodate through-penetration fire stop systems. Coordinate construction and sizing of joints to ensure that fire resistive joint systems are installed according to specified requirements.
- C. Coordinate firestopping with other trades so that obstructions are not placed in the way prior to the installation of the firestop systems.
- D. Do not cover up through-penetration and joint firestop system installations that will become concealed behind other construction until each installation has been examined by the building inspector, per requirements of Section 109, IBC 2000.

#### 3.03 INSTALLATION

A. Regulatory Requirements: Install firestop materials in accordance with UL or Intertek approved systems.

- B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.
  - 1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
  - 2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
  - 3. Protect materials from damage on surfaces subjected to traffic.
  - 4. Pre-Installation Meeting: Conduct a pre-installation meeting with General Contractor, Architect, Owner's Representative, Alabama Building Commission, Fire-Specialty Contractor, General Contractor's Fireproofing Consultant and all major subcontractors (mechanical, plumbing, electrical, fire protection, drywall, etc). The General Contractor shall take notes and distribute to all parties.

# 3.04 FIELD QUALITY CONTROL

- A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.
- D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.
- E. Manufacturer's Field Services: During initial installation, firestop manufacturer should be present to assure proper installation/application.

#### 3.05 IDENTIFICATION AND DOCUMENTATION

- A. The firestop contractor is to supply documentation in the form of the Hilti FTP "Firestop Tracking Process"
- B. The FTP is to include:
  - 1. Architectural details
  - 2. Firestop Affidavit

- 3. Firestop System snapshot
- 4. Installation log
- 5. Firestop systems
- 6. IFC Guidelines for Engineering Judgements
- 7. Product Information of utilized products
- 8. All other relevant documentation
- 9. Building code excerpts
- 10. Copies (electronic) of the FTP are to be provided to the General Contractor, Architect, Inspector and Owner at the completion of the project.
- 11. Identify through-penetration firestop systems with self-adhesive, preprinted labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
  - a. Installer/Contractor's name, address and phone number.
  - b. Date of installation.
  - c. Through-Penetration firestop system and manufacturer name.

## 3.06 ADJUSTING AND CLEANING

- A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
- B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

## 3.07 LABOR USE TO INSTALL FIRESTOP SYSTEMS

A. To ensure complete harmony on the project site, the installation of each scope of work is to be performed jurisdictional correct per existing trade agreements.

# END OF SECTION 07840 07 8401

#### SECTION 07 9005 - JOINT SEALERS

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.

# 1.02 RELATED REQUIREMENTS

- A. Section 07 4200 Metal Wall Panels
- B. Section 07 6200 Sheet Metal Flshing and Trim
- C. Section 08 1113 Hollow Metal Doors and Frames
- D. Section 08 4313 Aluminum Framed Storefronts
- E. Section 08 8000 Glazing: Glazing sealants and accessories.
- F. Section 09 9000 Painting and Coating

#### 1.03 REFERENCE STANDARDS

- A. ASTM C834 Standard Specification for Latex Sealants; 2014.
- B. ASTM C919 Standard Practice for Use of Sealants in Acoustical Applications; 2012.
- C. ASTM C1193 Standard Guide for Use of Joint Sealants; 2013.
- D. SCAQMD 1168 South Coast Air Quality Management District Rule No.1168; current edition.

# 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Samples: Submit two samples, 6 inch (\_\_\_\_x\_\_\_ mm) in size illustrating sealant colors for selection.
- D. Manufacturer's Installation Instructions: Indicate special procedures.

# 1.05 QUALITY ASSURANCE

- A. Maintain one copy of each referenced document covering installation requirements on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

#### **1.06 MOCK-UP**

A. Refer to 01 4000.

# 1.07 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

#### 1.08 WARRANTY

- A. See Section 01 7800 Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a the specified warranty periods.
  - 1. Unless noted otherwise, provide manufacturer's standard 5 year material warranty.
  - 2. Provide additional manufacturer's warranties listed for specific products.
- C. Provide General Contractor's Project Joint Sealant Warranty at the back of this specification section. Warranty to be signed by the Joint Sealant Contractor and General Contractor.
- D. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

## PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Silicone Sealants:
  - 1. Dow Corning: www.dowcorning.com
  - 2. Pecora Corporation: www.pecora.com.

- 3. Tremco: www.tremcosealants.com
- B. Polyurethane Sealants:
  - 1. Pecora; www.pecora.com
  - 2. Sonneborn; www.chemrex.com
  - 3. Tremco: www.tremcosealants.com
- C. Acrylic Emulsion Latex Sealants:
  - 1. Pecora Corporation: www.pecora.com.
  - 2. Sonneborn; www.chemrex.com
  - 3. Tremco; www.tremcosealants.com

#### 2.02 SEALANTS

- A. Sealants and Primers General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Type I General Purpose Exterior Sealant: Silicone; ASTM C 920, Grade NS, Class 25, Uses M; single component, ultra low-mod.
  - 1. Color: To be selected by Architect from manufacturer's full range.
  - 2. Product:
    - a. Dow 790
    - b. Pecora 890
    - c. Tremco Spectrem-1
  - 3. Applications: Use for:
    - a. Vertical and horizontal construction joints between masonry/concrete/stone to masonry/concrete/stone.
  - 4. Warranties: In addition to manufacturer's standard product warranties, Provide manufacturer's 20 year Non-Staining and 20 year Structural Adhesion limited warranties. Provide manufacturer's compatibility testing as required.
- C. Type II General Purpose Exterior Sealant: Silicone; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component, structural

- 1. Color: To be selected by Architect from manufacturer's full range.
- 2. Product:
  - a. Dow 795
  - b. Pecora 895
  - c. Tremco Spectrum -2
- 3. Applications: Use for:
  - All other vertical and horizontal construction joints not listed in sealant type I
     & III.
- 4. Warranties: In addition to manufacturer's standard product warranties, Provide manufacturer's 20 year Non-Staining and 20 year Structural Adhesion limited warranties. Provide manufacturer's compatibility testing as required.
- D. Type III Exterior Expansion Joint Sealer: Precompressed foam sealer; urethane with water-repellent;
  - 1. Face color: match adjacent materials.
  - 2. Product: Equal to Backerseal by Emseal
  - 3. Size as required to provide weathertight seal when installed.
  - 4. Applications: Use for:
    - a. Exterior wall expansion joints used in conjunction with Dow 790

#### 2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application, and compatible with joint substrates.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Sealant Backer Rod: Bi- Cellular Polyolefin foam rod equal to SOF ROD/ Nomaco and or Open cell Polyurethane foam equal to Foam Pak II/Nomaco. All backer rods shall be as recommended by sealant manufacture for specific use. Provide size and shape of rod to control joint depth, break bond at the bottom of joint, form optimum shape of bead on back side, and minimize the possibility of extrusion when joint is compressed.

- D. Joint Backing: Round foam rod compatible with sealant; oversized 25 percent larger than joint width.
- E. Tooling Agent: Agent recommended by material manufacturer to ensure contact of material with inner joint faces.
- F. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application. Provide self adhering tape where applicable.

## PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify that substrate surfaces and joint openings are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

## 3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

#### 3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.

H. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch (3 to 6 mm) below adjoining surface.

# 3.04 CLEANING

A. Clean adjacent soiled surfaces.

# 3.05 PROTECTION

A. Protect sealants until cured.

#### PROJECT JOINT SEALANT WARRANTY

eommerem	 
CONTRACTOR	
WATERPROOFING	
OWNER:	
LOCATION:	-
PROJECT :	

The Joint Sealant Contractor and General Contractor do hereby certify that the above and underground work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved joint sealants manufacturers' recommendations.

The Joint Sealant Contractor and General Contractor do hereby guarantee the joint sealants and associated work including but not limited to all above and underground vertical and horizontal joint sealants to be water tight 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 Final Acceptance of the project.

Subject to the terms and conditions listed below, the Joint Sealants Contractor and General Contractor also guarantee 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 joint sealant manufacturers recommendations as are necessary to correct faulty and defective work and/or materials which may develop in the work including. Anticipated life of the joint sealant systems and the best standards applicable to the particular joint sealant type in value and in accordance with construction documents as are necessary to maintain said work in watertight conditions, and further, to respond on or within seven (7) calendar days upon proper notification of leaks or defects by the Owner.

During the guarantee period, if the Owner allows alteration of the work by anyone other the Joint Sealant Contractor or General Contractor, including cutting, patching and maintenance in connection with penetrations, and positioning of anything affected by, this guarantee shall become null and void upon the date of said alterations.

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 joint sealant areas, and any damage caused by such addition. If this contract is for joint sealant of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing.

The Owner shall promptly notify the Joint Sealant Contractor or General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the Joint Sealant Contractor or General Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

IN WITNESS THEREOF,					
THIS INSTRUMENT HAS BEEN DUL'(YEAR).	Y EXECUTED THIS DAY OF				
GENERAL CONTRACTOR'S CONTRACTOR'S AUTHORIZED SIGNAL AUTHO	JOINT SEALANT NATURE PRIZED SIGNATURE				
TYPED NAME AND TITLE	TYPED NAME AND TITLE				
Notary Public					

END OF SECTION 07 9005

## SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES

# PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Steel glazing frames.

# 1.02 RELATED REQUIREMENTS

- A. Section 08 7100 Door Hardware.
- B. Section 08 8000 Glazing: Glass for doors and borrowed lites.
- C. Section 09 9113 Exterior Painting: Field painting.
- D. Section 09 9123 Interior Painting: Field painting.

# 1.03 REFERENCE STANDARDS

- A. ADA Standards Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ANSI/ICC A117.1 American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
- C. ANSI/SDI A250.3 Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2007 (R2011).
- D. ANSI/SDI A250.4 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- E. ANSI/SDI A250.8 Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
- F. ANSI/SDI A250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- G. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

- H. ASTM A1008/A1008M Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- I. ASTM A1011/A1011M Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- J. ASTM C1363 Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.
- K. ASTM F2927 Standard Test Method for Door Systems Subject to Airblast Loadings; 2012.
- L. BHMA A156.115 American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
- M. ICC A117.1 Accessible and Usable Buildings and Facilities; 2009.
- N. ITS (DIR) Directory of Listed Products; current edition.
- O. NAAMM HMMA 830 Hardware Selection for Hollow Metal Doors and Frames; 2002.
- P. NAAMM HMMA 831 Hardware Locations for Hollow Metal Doors and Frames; 2011.
- Q. NAAMM HMMA 840 Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
- R. NAAMM HMMA 860 Guide Specifications for Hollow Metal Doors and Frames; 2013.
- S. NAAMM HMMA 861 Guide Specifications for Commercial Hollow Metal Doors and Frames; 2006.
- T. NFPA 80 Standard for Fire Doors and Other Opening Protectives; 2016.
- U. NFPA 252 Standard Methods of Fire Tests of Door Assemblies; 2012.
- V. SDI 117 Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.
- W. UL (DIR) Online Certifications Directory; current listings at database.ul.com.
- X. UBC Std 7-2, Part II Test Standard for Smoke- and Draft-control Assemblies; International Conference of Building Officials; 1997.

- Y. UL 10B Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- Z. UL 10C Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- AA.UL 1784 Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

# 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- E. Manufacturer's Qualification Statement.

# 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Maintain at project site copies of reference standards relating to installation of products specified.

# 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

#### PART 2 PRODUCTS

# 2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:

1.	Ceco Door,	, an Assa Abloy	Group company; _	:	www.assaabloydss.com/#sle
----	------------	-----------------	------------------	---	---------------------------

- 2. Curries, an Assa Abloy Group company; \_\_\_\_: www.assaabloydss.com/#sle.
- 3. Mesker, dormakaba Group; \_\_\_\_\_: www.meskeropeningsgroup.com/#sle.
- 4. Republic Doors; Product \_\_\_\_: www.republicdoor.com.
- 5. Steelcraft: www.steelcraft.com.
- 6. Substitutions: See Section 01 6000 Product Requirements.

# 2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
  - 1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
  - 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
  - 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
  - 4. Door Edge Profile: Manufacturers standard for application indicated.
  - 5. Typical Door Face Sheets: Flush.
  - 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
  - 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
  - 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
  - 9. Finish: Factory primed, for field finishing.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

## 2.03 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS, Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS, Type B.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A40 metallic coating.

## 2.04 HOLLOW METAL DOORS

- A. Exterior Doors: Thermally insulated.
  - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 3 Extra Heavy-duty.
    - b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
    - c. Model 1 Full Flush.
    - d. Door Face Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
  - 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
  - 3. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
  - 4. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
  - 5. Insulating Value: U-value of 0.50, when tested in accordance with ASTM C 1363 .
  - 6. Weatherstripping: Refer to Section 08 7100.
- B. Interior Doors, Non-Fire-Rated:

- 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
  - a. Level 2 Heavy-duty.
  - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
  - c. Model 1 Full Flush.
- 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.

## C. Fire-Rated Doors:

- 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
  - a. Level 2 Heavy-duty.
  - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
  - c. Model 1 Full Flush.
  - d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
- 2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
  - a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
  - b. Attach fire rating label to each fire rated unit.
- 3. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
- D. Panels: Same construction, performance, and finish as doors.
- E. Hardware Reinforcement: ANSI/SDI A250.6-1997.

## 2.05 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

## B. General:

- 1. Comply with the requirements of grade specified for corresponding door.
  - a. ANSI A250.8 Level 1 Doors: 16 gage frames.

- b. Frames for Wood Doors: Comply with frame requirements specified in NAAMM HMMA 860
- 2. Finish: Same as for door.
- 3. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high (100 mm high) to fill opening without cutting masonry units.
- C. Exterior Door Frames: Full profile/continuously welded type.
  - 1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
  - 2. Weatherstripping: Separate, see Section 08 7100.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
  - 1. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch (150 mm), maximum, above floor at 45 degree angle.
- E. Door Frames, Fire-Rated: Full profile/continuously welded type.
  - 1. Fire Rating: Same as door, labeled.
- F. Mullions for Pairs of Doors: Removable type, with profile similar to jambs.
- G. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings. Coordinate with glazing requirements.
- H. Hardware Reinforcement: ANSI/SDI A250.6.
- I. Coordinate frame jamb depths with each wall condition.

## 2.06 ACCESSORIES

- A. Glazing: As specified in Section 08 8000, factory installed.
- B. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.
- C. Stops and Moldings:
  - 1. Moldings for Glazed Lites in Doors & Windows: Minimum 0.032-inch (0.8 mm) thick, same material as door face sheet. Metal lite kits are to be flush and shall not require shim kits for door hardware.
  - 2. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.

- 3. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch (0.8 mm) thick, same material as frames.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.
  - For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

## a. Jamb Anchors:

- 1) Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
- 2) Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
- 3) Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
- 4) Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- b. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:
  - 1) Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
  - 2) Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (50-mm) height adjustment. Terminate bottom of frames at finish floor surface.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
- G. Mineral-Fiber Insulation: ASTM C 665, Type I.

#### 2.07 FINISH MATERIALS

A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.

# 2.08 FABRICATION

- A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- B. Hollow Metal Doors:
  - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration with flush door cap.
  - 2. Glazed Lites: Factory cut openings in doors.
  - 3. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.
- C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
  - 2. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
  - 3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 4. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
  - 5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
  - 6. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
      - 1) Two anchors per jamb up to 60 inches (1524 mm) high.
      - 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.

- 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
- 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
- b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
  - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
  - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
  - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
  - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
  - 5) Two anchors per head for frames more than 42 inches (1066 mm) wide and mounted in metal-stud partitions.
- c. Compression Type: Not less than two anchors in each jamb.
- d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
- 7. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.
  - a. Single-Door Frames: Three door silencers.
  - b. Double-Door Frames: Two door silencers.
- D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware according to the Door Hardware Schedule and templates furnished as specified in Division 8 Section "Door Hardware."
  - 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
  - 2. Reinforce doors and frames to receive nontemplated, mortised and surfacemounted door hardware.
  - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

- 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 16 electrical Sections.
- E. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
  - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
  - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
  - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
  - 4. Provide loose stops and moldings on inside of hollow metal work.
  - 5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

## PART 3 EXECUTION

# 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

# 3.02 PREPARATION

# 3.03 INSTALLATION

- A. Hollow Metal Frames: Comply with ANSI/SDI A250.11.
  - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. At fire-protection-rated openings, install frames according to NFPA 80.
    - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

- c. Install frames with removable glazing stops located on secure side of opening.
- d. Install door silencers in frames before grouting.
- e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
- f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
- g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
- h. Remove temporary "shipping spreader bars" before installation.
- 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
  - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
- 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
- 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
- 5. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
- 6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
- 7. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
- 8. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.

- 9. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
  - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- B. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
  - 1. Non-Fire-Rated Standard Steel Doors:
    - a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
    - b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
    - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
    - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).
  - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
  - 3. Smoke-Control Doors: Install doors according to NFPA 105.
- C. Glazing: Comply with installation requirements in Division 8 Section "Glazing" and with hollow metal manufacturer's written instructions.
  - 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (50 mm) o.c. from each corner.

#### 3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

# 3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

# 3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

# END OF SECTION 08 1113

## SECTION 08 3100 - ACCESS DOORS AND PANELS

# PART 1 GENERAL

# 1.01 SECTION INCLUDES

- A. Fire Rated Access Door and Frame Units, in Wall Locations.
- B. MR Credit 4 Recycled Content (30%)
- C. MR Credit 5 Regional Materials (30%)
- D. IEQ Credit 4.1 Low-Emitting Materials-Adhesives and Sealants
- E. IEQ Credit 4.2 Low-Emitting Materials-Paints and Coatings
- F. IEQ Credit 4.4 Low-Emitting Materials-Composite Wood and Agrifiber Products

# 1.02 RELATED REQUIREMENTS

A. Section 09 9113 - Exterior Painting: Field paint finish.

# 1.03 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; current edition.

# 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
- D. Manufacturer's Installation Instructions: Indicate installation requirements and roughin dimensions.

# PART 2 PRODUCTS

# 2.01 ACCESS DOORS AND PANELS ASSEMBLIES

## 2.02 MANUFACTURERS

# 2.03 WALL UNITS

- A. Non-Fire Rated Door and Frame Units: Formed steel.
  - 1. Frames and flanges: 0.058 inch (1.5 mm) steel.

- 2. Door panels: 0.070 inch (1.8 mm) single thickness steel sheet at interior panels.
- 3. Door panels: 0.070 inch (1.8 mm) double sheet with integral non-combustible insulation filler at exterior panels.
- 4. Sizes:
  - a. Walls: 36 x 36 inches.
  - b. Ceilings: 36 x 36 inches.
- 5. Hardware:
  - a. Hinge: 175 degree steel piano hinge with removable pin.
  - b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
  - c. Latch/Lock: Cylinder lock-operated cam latch, two keys for each unit.
- 6. Prime coat with alkyd primer.
- 7. Finish: Field Paint Refer to 09 9000
- B. Fire Rated Door and Frame Units: Formed Steel.
  - 1. Frames and Flanges: 16 gage door, 16 gage mounting frame, 1" wide flange.
  - 2. Sizes: 36" x 36"
  - 3. Refer to drawing for location of access panels.
  - 4. Hardware:
    - a. Hinge: 175 degree steel piano hinge with removable pin.
    - b. Lock: Cylinder lock with latch, two keys for each unit.
  - 5. Prime coat with alkyd primer.
  - 6. Fire Rating as indicated on drawings and door schedule.

# PART 3 EXECUTION

# 3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

# 3.02 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.

# END OF SECTION 08 3100

This page intentionally left blank

## **SECTION 08 3313 - COILING COUNTER DOORS**

# PART 1 GENERAL

## 1.01 SECTION INCLUDES

A. Non-Fire rated coiling counter doors and operating hardware.

# 1.02 RELATED REQUIREMENTS

- A. Section 06 1000 Rough Carpentry: Rough openings.
- B. Section 07 9200 Joint Sealants: Sealing joints between frames and adjacent construction.

# 1.03 REFERENCE STANDARDS

- A. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- B. UL (DIR) Online Certifications Directory; current listings at database.ul.com.

# 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish. Include data on electrical operation.
- C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit two slats, 4 inch long (102 mm long), illustrating shape, color and finish texture.
- E. Manufacturer's Instructions: Indicate installation sequence and installation, adjustment, and alignment procedures.
- F. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.

# 1.05 QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

## PART 2 PRODUCTS

# 2.01 MANUFACTURERS

- A. Coiling Counter Doors:
  - 1. Overhead Coiling Doors, Inc.; Model 651(Fire-Rated Counter Door), www.overheaddoor.com or Approved Equal..
  - 2. Substitutions: See Section 01 6000 Product Requirements.

# 2.02 COILING COUNTER DOORS

- A. Coiling Counter Doors, Non-Fire-Rated: Stainless steel slat curtain.
  - 1. Mounting: Interior face mounted.
  - 2. Provide integral frame and sill of same material and finish.
  - 3. Curtain: Interlocking slats, Type F-158 fabricated of 22 guage stainless steel. Endlocks attached to alternate slats to maintain curtain alignment and prevent lateral slat movement.
  - 4. Nominal Slat Size: 1-1/4 inches (32 mm) wide.
  - 5. Finish, Stainless Steel: No. 4 Brushed.
  - 6. Guides: Formed track; same material and finish of door curtain unless otherwise indicated.
  - 7. Hood Enclousre: stainless steel; provided with intermediate support brackets as required and fabricated of stainless steel.
  - 8. Manual push up operation.
  - 9. Locking Devices: Slide bolt on inside.

# 2.03 MATERIALS

- A. Curtain Construction: Interlocking, single thickness slats.
  - 1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
  - 2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.

- B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
  - 1. Stainless Steel Guides: ASTM A666, Type 304, rollable temper.

## C. Lock Hardware:

- 1. Slide Bolt: Provide on single-jamb side, extending into slot in guides, with padlock on one side.
- D. Roller Shaft Counterbalance: Steel pipe and torsion steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb (10 kg) nominal force to operate.

#### PART 3 EXECUTION

# 3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

## 3.02 INSTALLATION

- A. Install units 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. Install perimeter trim as indicated.

# 3.03 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch (1.5 mm).
- C. Maximum Variation From Level: 1/16 inch (1.5 mm).
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft (3 mm per 3 m) straight edge.

# 3.04 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

# 3.05 CLEANING

- A. Clean installed components.
- B. Remove labels and visible markings.

# END OF SECTION 08 3313

## SECTION 08 3323 - OVERHEAD COILING DOORS

# PART 1 GENERAL

# 1.01 SECTION INCLUDES

- A. Overhead coiling doors, operating hardware, non-fire-rated and exterior, manual and electric operation.
- B. Wiring from electric circuit disconnect to operator to control station.
- C. Counter door

# 1.02 RELATED REQUIREMENTS

- A. Section 07 9200 Joint Sealants: Sealing joints between frames and adjacent construction.
- B. Section 13 3410 Metal Building Systems
- C. Section 26 0583 Wiring Connections: Power to disconnect.

# 1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- C. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- D. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- E. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- F. ASTM B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- G. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.
- H. NEMA ICS 2 Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2000 (R2005), with errata, 2008.

## 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide general construction and component connections and details.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Sample warranty
- E. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

# 1.05 QUALITY ASSURANCE

- A. Warranty: Provide manufacturers warranty (24 month from Final Acceptance)
- B. Provide manufacturers warranty 3 year / 20,000 cycles limited warranty on door & operator system.

#### PART 2 PRODUCTS

# 2.01 MANUFACTURERS

A.	Overhead	Coiling	Doors:
T .	Ofciliona	Commis	DOGED.

1.	Overhead Doors Company; Product Equal to: Overhead Door Model 625 .
2.	Cornell Iron Works, Inc;: www.cornelliron.com/#sle.
3.	The Cookson Company;: www.cooksondoor.com/#sle.
4.	·

5. Substitutions: See Section 01 6000 - Product Requirements.

# 2.02 COILING DOORS

- A. Exterior and Non-Fire Rated Interior Coiling Doors: Steel slat curtain.
  - 1. Capable of withstanding positive and negative wind loads of 20 psf (940 Pa), without undue deflection or damage to components.
  - 2. Sandwich slate construction with insulated core of foamed in place, CFC-free polyurethane insulation. Minimum R-value of 7.7 for door assembly.

- 3. Nominal Slat Size: 5/8" thick x 3" wide inches (16 x76 inches) wide x required length.
- 4. Finish: Factory painted, PowderGuard Premium powder coat finish, Manufacturer's colors as selected by Owner and Architect, provide full range color selection. Interior Color finish to be **White**. Exterior Color finish as selected by Owner and Architect.
- 5. Guides: Angles; primed steel. job field Painted by color selection provided by Owner and Architect
- 6. Hood Enclosure: Manufacturer's standard; primed steel. Match finish of door.
- 7. Manual hand chain lift operation.
- 8. Electric operation doors installed at GPTB only. Provide chain operated at Readiness Center exterior door.
- 9. Mounting: Within framed opening As indicated., 20,000 cycles
- 10. Weather Seals: Bottom exterior curtain-side guide, interior hood baffle
- B. Non-Fire-Rated Interior Rolling Counter Coiling Doors: Stainless steel slat curtain. Equal to Overhead Door Model 651.
  - 1. Curtain: Interlocking slats, Type F-158 fabricated of 22 gauge stainless steel. Endlocks attached to alternate slats to maintain curtain alignment and prevent lateral slat movement.
  - 2. Nominal Slat Size: 1.5 inches (\_\_\_\_ mm) wide x required length.
  - 3. Finish: Factory painted, color as selected by Owner and Architect
  - 4. Guides: Angles; stainless steel.
  - 5. Hood Enclosure: stainless steel; provided with intermediate support brackets as required and fabricated of stainless steel..
  - 6. Manual push up operation.
  - 7. Mounting: Surface mounted.
  - 8. Locking Devices: Slide bolt on inside.

# 2.03 MATERIALS AND COMPONENTS

A. Curtain Construction: Interlocking slats.

- 1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
- 2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.
- 3. Weatherstripping: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.
- B. Steel Slats: Minimum thickness, 24 gage (\_\_\_\_\_ mm); ASTM A653/A653M galvanized steel sheet. Insulated equal to Overhead door slat F-265i
- C. Stainless Steel Slats: Minimum thickness, \_\_\_ gage, \_\_\_ inch (\_\_\_ mm), complying with ASTM A 666, Type 304, rollable temper.
- D. Guides Angle: ASTM A36/A36M metal angles, size as indicated.
- E. Guides Sheet Metal: Formed from sheet metal, \_\_\_ gage, \_\_\_ inch (\_\_\_ mm) thick; \_\_\_ inch (\_\_\_ mm) wide.
  - 1. Prime paint.
- F. Stainless Steel: ASTM A 666, Type 304, rollable temper.
- G. Hood Enclosure: Internally reinforced to maintain rigidity and shape. Provide 24 gauge galvanized steel. Mounted on Face of wall, interior side.
- H. Lock Hardware:
  - 1. Latching Mechanism: Inside mounted, adjustable keeper, spring activated latch bar feature to keep in locked or retracted position.
  - 2. Slide Bolt: Provide on single-jamb side, extending into slot in guides, with padlock on one side.
- I. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb (10 kg) nominal force to operate.

## 2.04 ELECTRIC OPERATION

- A. Electric Operators: Installed in GPTB only. Provide chain operated at Readiness Center exterior door.
  - 1. Mounting: Side mounted.

- 2. Motor Enclosure:
- 3. Motor Rating: 3/4 hp (560 W); continuous duty.
- 4. Motor Voltage: 120 volts, single phase, 60 Hz.
- 5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
- 6. Controller Enclosure: NEMA 250, Type 1.
- 7. Opening Speed: 12 inches per second (300 mm/sec).
- 8. Brake: Adjustable friction clutch type, activated by motor controller.
- 9. Manual override in case of power failure.
- 10. Refer to Section 26 0583 for electrical connections.
- B. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325.
  - 1. 24 volt circuit.
  - 2. Surface mounted. 3 button station
  - 3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
    - a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.
- C. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

# **PART 3 EXECUTION**

# 3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

# 3.02 INSTALLATION

- A. Install units 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 26 0583.
- F. Complete wiring from disconnect to unit components.

# 3.03 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch (1.6 mm).
- C. Maximum Variation From Level: 1/16 inch (1.6 mm).
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft (3.2 mm per 3 m) straight edge.

# 3.04 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

# 3.05 CLEANING

- A. Clean installed components.
- B. Remove labels and visible markings.

# **END OF SECTION 08 3323**

## SECTION 08 3402 - BULLET-RESISTANT COMPONENTS

# PART 1 GENERAL

# 1.01 SECTION INCLUDES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

# B. AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

 AAMA 611, 2014) Voluntary Specification for Anodized Architectural Aluminum.

# C. ASTM INTERNATIONAL (ASTM)

- 1. ASTM A123/A123M,(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- 2. ASTM A653/A653M, (2023) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- 3. ASTM C1036, (2021) Standard Specification for Flat Glass
- 4. ASTM C1048, (2018) Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
- 5. ASTM C1172, (2019) Standard Specification for Laminated Architectural Flat Glass
- 6. ASTM D256, (2010; R 2018) Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
- 7. ASTM D542, (2014) Index of Refraction of Transparent Organic Plastics
- 8. ASTM D570, (1998; E 2010; R 2010) Standard Test Method for Water Absorption of Plastics
- 9. ASTM D635, (2018) Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
- 10. ASTM D638, (2014) Standard Test Method for Tensile Properties of Plastics
- 11. ASTM D696, (2016) Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degrees C and 30 degrees C With a Vitreous Silica Dilatometer

- 12. ASTM D792, 2013) Density and Specific Gravity (Relative Density) of Plastics by Displacement
- 13. ASTM D882, (2012) Tensile Properties of Thin Plastic Sheeting
- 14. ASTM D905, (2008; E 2009) Strength Properties of Adhesive Bonds in Shear by Compression Loading
- 15. ASTM D1003, (2013) Haze and Luminous Transmittance of Transparent Plastics
- 16. ASTM D1044, (2019) Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion by the Taber Abraser
- 17. ASTM D1922, (2015; R 2020) Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method
- 18. ASTM D3595, (2014) Polychlorotrifluoroethylene (PCTFE) Extruded Plastic Sheet and Film
- 19. ASTM D3951, (2018) Commercial Packaging
- 20. 20. ASTM D4093, (1995; R 2014) Photoelastic Measurements of Birefringence and Residual Strains in Transparent or Translucent Plastic Materials
- 21. ASTM D4802, (2016) Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet
- 22. ASTM D5420, (2016) Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Strike Impacted by a Falling Weight (Gardner Impact)
- 23. ASTM E90, (2023) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- 24. ASTM E169, (2016; R 2022) Standard Practices for General Techniques of Ultraviolet-Visible Quantitative Analysis
- 25. ASTM E204, (1998; R 2007) Identification of Material by Infrared Absorption Spectroscopy, Using the ASTM Coded Band and Chemical Classification Index
- 26. 26. ASTM E831, (2014) Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis
  - a. ASTM E1300, (2016) Standard Practice for Determining Load Resistance of Glass in Buildings

- 27. ASTM F428, (2019) Intensity of Scratches on Aerospace Glass Enclosures
- 28. ASTM F520, (2021) Standard Test Method for Environmental Resistance of Aerospace Transparencies to Artificially Induced Exposures
- 29. ASTM F521, (2022) Standard Test Methods for Bond Integrity of Transparent Laminates
- 30. ASTM F548, (2019) Standard Test Method for Intensity of Scratches on Aerospace Transparent Plastics
- 31. ASTM F548, (2019) Standard Test Method for Intensity of Scratches on Aerospace Transparent Plastics
- 32. ASTM F735,(2022) Standard Test Method for Abrasion Resistance of Transparent Plastics and Coatings Using the Oscillating Sand Method
- 33. ASTM F791,(1996; R 2013) Stress Crazing of Transparent Plastics
- 34. ASTM F1233,(2021) Standard Test Method for Security Glazing Materials and Systems
- 35. ASTM G155, (2021) Standard Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials

# D. BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

- 1. ANSI/BHMA A156.1, (2021) Butts and Hinges
- 2. ANSI/BHMA A156.4, (2013) Door Controls, Closers
- 3. ANSI/BHMA A156.5, (2020) Cylinder and Input Devices for Locks
- 4. ANSI/BHMA A156.8, (2021) Door Controls Overhead Stops and Holders
- 5. ANSI/BHMA A156.13, (2022) Mortise Locks & Latches Series 1000
- 6. ANSI/BHMA A156.16, (2023) Auxiliary Hardware
- 7. ANSI/BHMA A156.18, (2020) Materials and Finish
- 8. ANSI/BHMA A156.115, (2016) Hardware Preparation in Steel Doors and Steel Frames

# E. GLASS ASSOCIATION OF NORTH AMERICA (GANA)

1. GANA Glazing Manual, (2008) Glazing Manual

# F. NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

- 1. NAAMM HMMA 810, (2009) Hollow Metal Doors
- 2. NAAMM HMMA 820, (2008) Hollow Metal Frames
- 3. NAAMM HMMA 830, (2002) Hardware Selection for Hollow Metal Doors and Frames
- 4. NAAMM HMMA 840, (2017) Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames
- 5. AAMM HMMA 862, (2021) Guide Specifications for Commercial Security Hollow Metal Doors and Frames

# G. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

- NEMA ICS 2, (2000; R 2020) Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated 600 V
- 2. NEMA ICS 6, (1993; R 2016) Industrial Control and Systems: Enclosures
- 3. NEMA MG 1, (2021) Motors and Generators

# H. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- 1. NFPA 70, (2023; ERTA 7 2023; TIA 23-15) National Electrical Code
- 2. NFPA 80, (2022) Standard for Fire Doors and Other Opening Protectives
- I. K. NATIONAL INSTITUTE OF JUSTICE (NIJ)
  - 1. NIJ Std 0108.01, (1985) Ballistic Resistant Protective Materials
- J. U.S. DEPARTMENT OF STATE (SD)
  - 1. SD Std-01.01, (1993 Rev G Amended; Inx Certified Prod/Mfg) Certification Standard Forced Entry and Ballistic Resistance of Structural Systems

# K. UNDERWRITERS LABORATORIES (UL)

1. UL 752, (2023) UL Standard for Safety Bullet-Resisting Equipment

# 1.02 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.

- B. AMCA 500-D Laboratory Methods of Testing Dampers for Rating; 2018.
- C. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- D. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- E. ASTM C1036 Standard Specification for Flat Glass; 2011.
- F. ASTM C1048 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- G. ASTM C1172 Standard Specification for Laminated Architectural Flat Glass; 2014.
- H. ASTM D256 Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010 (Reapproved 2018).
- ASTM D570 Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).
- J. ASTM D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2018.
- K. ASTM D638 Standard Test Method for Tensile Properties of Plastics; 2014.
- L. ASTM D696 Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between 30 C and 30 C with a Vitreous Silica Dilatometer; 2016.
- M. ASTM D792 Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement; 2013.
- N. ASTM D882 Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2018.
- O. ASTM D905 Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2008 (Reapproved 2013).
- P. ASTM D1003 Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics; 2013.
- Q. ASTM D1044 Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion by the Taber Abraser; 2019.
- R. ASTM D4802 Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet: 2016.

- S. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- T. ASTM E1300 Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.
- U. ASTM F1233 Standard Test Method for Security Glazing Materials And Systems; 2008 (Reapproved 2013).
- V. ASTM G155 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013.
- W. BHMA A156.1 American National Standard for Butts and Hinges; 2016.
- X. BHMA A156.4 American National Standard for Door Controls Closers; 2013.
- Y. BHMA A156.5 American National Standard for Cylinders and Input Devices for Locks; 2014.
- Z. BHMA A156.8 American National Standard for Door Controls Overhead Stops and Holders; 2015.
- AA.BHMA A156.13 American National Standard for Mortise Locks & Latches Series 1000; 2017.
- BB. BHMA A156.16 American National Standard for Auxiliary Hardware; 2013.
- CC. BHMA A156.18 American National Standard for Materials and Finishes; 2016.
- DD.BHMA A156.115 American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
- EE. NAAMM HMMA 830 Hardware Selection for Hollow Metal Doors and Frames; 2002.
- FF. NAAMM HMMA 840 Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
- GG.NAAMM HMMA 850 Fire-Protection and Smoke Control Rated Hollow Metal Door and Frame Products; 2014.
- HH.NAAMM HMMA 862 Guide Specifications for Commercial Security Hollow Metal Doors and Frames; 2013.
- II. NEMA ICS 2 Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2000 (R2005), with errata, 2008.

- JJ. NEMA ICS 6 Industrial Control and Systems: Enclosures; 1993 (Reaffirmed 2016).
- KK.NEMA MG 1 Motors and Generators; 2014.
- LL. NFPA 70 National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- MM. NFPA 80 Standard for Fire Doors and Other Opening Protectives; 2016.
- NN.UL 752 Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

## 1.03 SYSTEM DESCRIPTION

- A. Design Requirements
  - Provide bullet resistant components conforming to the requirements specified for the particular items and, as much as possible, complete assemblies by a single manufacturer.
- B. Performance Requirements
  - 1. Specify all bullet resistant items to the threat specified. Operate movable and operable components smoothly and freely. When a reference for performance is listed, conform to referenced requirements.
  - 2. Level of ballistic resitance to be UL 752 Level 5
- C. Submittal Requirement Details
  - 1. Submit the following:
    - a. Manufacturer's descriptive data and installation instructions. Include cleaning instructions as recommended by the plastic sheet manufacturer.
    - b. Lists including schedule of all components to be incorporated in the work with manufacturerer's model or catalog numbers, specification and drawings reference numbers, warranty information, threat level certified, fire ratings, sound transmission coefficient ratings, insulation "U" value, and number of items provided.
    - c. Evidence that standard products essentially duplicate items that have been satisfactorily in use for two years or more, including name of purchasers, locations of installations, dates of installations, and service organizations.

- d. Manufacturer's certificates attesting that all components conform to the requirements on drawings and in specifications. Include testing reports from independent testing laboratories indicating conformance to regulatory requirements.
- e. Six copies of operation and six copes of maintenance manuals for the bifold doors furnished. The manuals must be approved prior to beneficial occupancey.

# 1.04 SUBMITTALS

- A. Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:
  - 1. SD-02 Shop Drawings
    - a. Installation; G
  - 2. SD-03 Product Data
    - a. Bullet Resistant Components
  - 3. SD-07 Certificates
    - a. Bullet Resistant Components
  - 4. SD-10 Operation and Maintenance Data
    - a. Bullet Resistant Components; G

# 1.05 QUALITY ASSURANCE

A. 1. Provide Bullet-resistant components at locations shown on the drawings. Bullet-resistant components must be in accordance with UL 752 Level 5.

# 1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver components to the job site with the brand, name, and model number clearly marked thereon. Deliver, store and handle all components so as not to be damaged or deformed, and in accordance with ASTM D3951. Handle doors, windows, and louvers carefully to prevent damage to the faces, edges, corners, ends, and glazing. Clean, repair, or replace abraded, scarred, or rusty areas immediately upon detection. Replace damaged components that cannot be restored to like-new condition. Store components

and equipment in a dry location on platforms or pallets that are ventilated adequately, free of dust, water, and other contaminants, and stored in a manner which permits easy access for inspection and handling.

# 1.07 SCHEDULING

A. Glaze bullet-resistant windows, except factory-glazed units, after all concrete, masonry, ceiling, electrical, mechanical, plumbing and adjacent finish work is complete to avoid damage to the glazing material. Cover factory-glazed windows to protect them from damage during adjacent finish work.

#### 1.08 WARRANTY

A. 1. Furnish manufacturer's warranty for 5 years for glazing materials. Provide for replacement and installation of glazing if delamination, discoloration, or cracking, or crazing occurs.

#### **PART 2 PRODUCTS**

#### 2.01 MATERIALS AND COMPONENTS

A. Provide materials and components which are the standard products of a manufacturer regularly engaged in the manufacture of such products, unless otherwise indicated and detailed on the drawings, and that essentially duplicate items that have been in satisfactory use for at least two years prior to bid opening. Provide components supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site, or by the manufacturer. Where components are detailed on the drawings and do not conform to a manufacturer's standard product, provide components that are constructed of manufacturer's standard materials which conform to the specified ballistic standard or test. Provide bullet-resistant component assemblies of size and type indicated and provide at locations shown. Design all items included for exterior installation to resist water penetration or entrapment.

# 2.02 ELECTRICAL WIRING

A. Provide electrical wiring and conduit as specified in Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

#### 2.03 BULLET-RESISTANT STEEL PERSONNEL DOORS

A. Provide factory fabricated door/frame assemblies, designed to be bullet resistant to the specified threat level, and conforming to applicable requirements of NAAMM HMMA 810, NAAMM HMMA 820, NAAMM HMMA 862, this section, and requirements indicated on drawings. Provide frames furnished by the door fabricator. Provide door

silencers to cushion the impact of the door on the frame so that steel to steel contact is not made during closing. Completely weatherstrip, weatherproof, and fully insulate exterior doors. Exterior doors must close at flush top and bottom edges. Seal tops of doors against water penetration.

#### B. Fire Rated Doors

1. Provide fire rated doors at locations shown on the drawings. Furnish door assemblies bearing the identifying label of the Underwriters Laboratories, or a nationally recognized testing agency qualified to perform certificate programs, indicating that the units conform to the requirements for Special Purpose Type Fire Doors in accordance with NFPA 80. Construct fire rated doors in accordance with NAAMM HMMA 850. Certificate may be furnished in lieu of label. For oversized fire doors, state that doors are manufactured in compliance with the requirements for doors of this type and class, and have been tested and meet the requirements for the class indicated.

#### C. Door and Frame Fabrication

1. Exercise special care during welding to prevent warping. Design stiffeners and attach interior armor plates such that heat-affected areas, which result from welding, do not allow a potential ballistic leak in product construction. Make subsurfaces flat, parallel, and plumb after fabrication. Construct doors and frames of bullet-resistant steel or hollow metal with internal armoring such that the completed assembly meets the specified regulatory requirements. Reinforce and fully insulate doors in accordance with manufacturer's design. Miter or cope steel door frames and weld at the corners with all welds ground smooth. Design corner assemblies to eliminate ballistic penetrable seams. Where structural channel frames are used, make stops of 38 mm (1-1/2 inch) by 16 mm (5/8 inch) bars welded or top screwed to the frame at not more than 150 mm (6 inch) centers. Furnish countersunk screws. Place stops so that full contact with the frame will be assured. Make necessary reinforcements and drill and tap the frames as required for the hardware. Miter or cope frame channels and weld at corners with full penetration groove welds. Dress smooth exposed welds.

# D. Preparation for Hardware

1. Prepare doors and frames for hardware in conformance with Section 08 71 00 DOOR HARDWARE, and NAAMM HMMA 830. Drill and tap frames for surface applied hardware in the field.

# E. Hardware

 Furnish hardware for bullet-resistant door assembly provided by the door assembly manufacturer to ensure a complete bullet resistant assembly. Where test standard requires hardware to be tested with the door assembly, include hardware in the labeling and/or test certification. Key as specified in Section 08 71 00 DOOR HARDWARE.

#### F. Mortise Locks and Latchsets

1. Furnish mortise lock and latchsets that are series 1000, operational Grade 1, Security Grade 1 or 1A, functions as indicated in the Hardware Schedule, and conforming to ANSI/BHMA A156.13. Furnish strikes for all mortise locks and latches, including deadlocks, conforming to ANSI/BHMA A156.115 except provide rectangular strikes without lip for security doors. Provide mortise-type locks and latches for doors 44 mm (1-3/4 inches) thick and over that have adjustable bevel fronts or otherwise conforming to the shape of the door. Mortise locks must have armored fronts. Mortise locks and latches must have full escutcheon, thru-bolted, extruded stainless steel trim.

# G. Hinges

Equip all 2.1 m (7 feet - 0 inch) high doors with a minimum of three Grade 1 hinges in accordance with ANSI/BHMA A156.1, minimum size 125 mm (5 inches) high, heavy, double or triple weight as required for weight of door, or a single, continuous extra-heavy-duty piano-type hinge sized to carry the weight of the door without sagging. For each additional 300 mm (12 inches) of door height beyond 2.1 m (7 feet - 0 inch), provide minimum of one more hinge. Equip doors greater than 2.1 m (7 feet - 0 inches) with a minimum of four hinges. Provide hinges that are full mortise, half mortise, full surface or half surface design as recommended by manufacturer for frame and door design, and tamperproof or mount on the inside face of the door. Provide hinge manufacturer's certification that the hinge supplied meets all applicable test requirements of ANSI/BHMA A156.1, type, number of hinges specified, and that the hinge is suitable for the size and weight of the door assembly on which it will be utilized. If continuous pianotype hinges are provided with door, furnish independent laboratory reports covering both the door weight capacity and a 2,500,000-cycle testing to match ANSI/BHMA A156.1 Grade 1 requirements. Provide steel, prime coated interior door hinges. Provide nonferrous metal or stainless steel exterior door hinges.

# H. Electric Strikes

1. Provide electric strikes conforming to ANSI/BHMA A156.5, Grade 1. Furnish strike boxes with dead bolt and latch strikes for Grade 1.

#### I. Door Closers

1. Provide extra heavy duty closers of size and type recommended by manufacturer, and Grade 1 in accordance with ANSI/BHMA A156.4. Provide door closer finish that is [600] [689] [690] [691] [692] in accordance with ANSI/BHMA A156.18.

# J. Door Stops and Holders

1. Provide extra heavy duty door stops [and holders] [Type C08511 in accordance with ANSI/BHMA A156.8] [[Type L11251] [and] [Type L11271] in accordance with ANSI/BHMA A156.16] [\_\_\_\_\_].

#### K. Frame Anchors

Provide jamb anchors with door/frame assembly conforming to manufacturer's
recommendations to ensure complete bullet-resistant assemblies. Make provisions
to stiffen the top member of all spans over 900 mm (3 feet). Extend the bottom of
the frames below the finish floorline and secure to the floor slab by means of angle
clips and expansion bolts. Floor clips are not required for installation in pre-built
or existing openings.

# L. Weatherstripping

Provide head and jambs with compression-type neoprene bulb or closed-cell
neoprene adjustable-type weatherstripping. Weatherstrip door stops with a
surface-mounted sponge neoprene strip in bronze housing no less than 1.78 mm
(0.070 inch) thick installed to make contact with the door. Install weatherstripping
in conformance with the manufacturer's directions after completion of finish
painting.

# 2.04 BULLET-RESISTANT STEEL WINDOWS

A. Fabricate window assemblies from [bullet-resistant steel shapes] [or] [hollow metal with internal armoring] and bullet-resistant glazing materials specified herein; the entire assembly must meet or exceed the specified regulatory requirements. Provide welded frame units of sizes and shapes indicated on the drawings with minimum frame face dimensions of 50 mm (2 inches). Furnish glazing material with window assembly for onsite installation, or furnish factory glazed window units. Entire assembly must be furnished by same manufacturer. Weld exterior (attack side) glazing stops or integral to frame. Provide removable interior (protected side) glazing stops attached with high-strength alloy steel machine screws with tamper-resistant heads.

# B. Glazing Materials

1. Provide factory fabricated units designed to be bullet-resistant to the specified test standard in paragraph COMPONENT TEST REQUIREMENTS. Glazing material must be glass or composite with a low-spall protected (interior) face. Low-spall interior face must meet or exceed requirements for spall resistance defined in UL 752. Provide glazing material conforming to applicable requirements contained in ASTM C1036, ASTM C1048, and ASTM E1300. Test glazing materials in accordance with the applicable sections of the following testing procedures: ASTM D905, ASTM D1003, ASTM F428, ASTM F548, ASTM D4093, and ASTM F520.

# C. Laminated Glass

1. Provide bullet-resistant laminated glass consisting of all glass laminated construction conforming to applicable sections of ASTM C1172. The adhesive interlayer material for bonding glass to glass must be chemically compatible with the surfaces which are to be bonded. Test materials selected for lamination purposes in accordance with the following testing procedures: ASTM D905, ASTM D1044, ASTM F735, ASTM D4093, ASTM F521, ASTM F520, and ASTM D1003. Use glass plies in the lamination that are annealed float glass conforming to Type I, quality q3 Class 1, in accordance with ASTM C1036.

#### D. Sealants

1. Furnish sealants for glazings that are chemically compatible with the glazing materials they contact with no deleterious effects to the glazing materials or to the adhesives used in laminates. Sealants must be in accordance with glazing manufacturer's recommendations and GANA Glazing Manual.

#### 2.05 ACCESSORIES

A. Provide all accessories for the installation or erection of above components into the surrounding structure. Anchorage must be as strong and bullet-resistant as the components. Install/erect in accordance with manufacturer's recommended instructions.

# 2.06 LABELING

- A. A. Plainly and permanently label bullet-resistant equipment in accordance with regulatory requirements. Provide label that is compatible with plastic or coating, visible only on protected side, after installation, including the following information:
  - 1. Manufacturer's name or identifying symbol
  - 2. Model Number, Control Number, or equivalent

- 3. Date of manufacture by week, month or quarter and year. This may be abbreviated or be in a traceable code such as the lot number.
- 4. Correct mounting position including threat side and secure side (by removable label on glazing material).
- 5. Code indicating bullet-resistant rating and test standard used (by removable label on glazing material).

# 2.07 SHOP/FACTORY FINISHING

A. Furnish all ferrous metal components, except stainless steel, primed for painting unless indicated otherwise. Perform finish painting in accordance with Section 09 90 00 PAINTS AND COATINGS, unless otherwise indicated. When anodic coatings are specified, the coatings must conform to AAMA 611, with coating thickness not less than that specified for protective and decorative type finish in AA DAF45. Apply a polished satin finish pretreatment and a clear lacquer overcoat to anodized items. Shop finish all factory or manufactured components as indicated.

#### B. Ferrous Metal

1. Clean surfaces of ferrous metal, except galvanized and stainless steel surfaces, and shop coat with the manufacturer's standard protective coating other than a bituminous protective coating, compatible with finish coats. Prior to shop painting, clean surfaces with solvents to remove grease and oil, and with power wire-brushing or sandblasting to remove loose rust, loose mill scale and other foreign substances. Do not shop paint surfaces of items to be embedded in concrete.

# C. Galvanizing

1. Items specified to be galvanized must be hot-dip processed after fabrication. Galvanize in accordance with ASTM A123/A123M or ASTM A653/A653M as applicable.

#### D. Aluminum

1. Unless otherwise specified, aluminum items must be standard mill finish. For anodic coatings see paragraph SHOP/FACTORY FINISHING above.

#### PART 3 EXECUTION

# 3.01 EXAMINATION

A. Field verify dimensions of rough openings for components, and that surfaces of openings are plumb, true, and provide required clearances. Protect surrounding work prior to installation of bullet-resistant components. Restore surrounding work which is damaged as a result of the installation of bullet-resistant components to like-new condition prior to acceptance of the work described herein. Examine existing work to ensure that it is ready for installation or erection of the components. Check and correct components for racking, twisting, and other malformation prior to installation. Set frames true, plumb and aligned for proper installation. Examine all surfaces and connections for damage prior to installation.

#### 3.02 FRAMED INSTRUCTIONS

A. Post framed instructions, under glass or in plastic with all edges laminated, including wiring and control diagrams showing the complete layout of each bifold door unit, where directed. Prepare condensed operating instructions explaining preventive maintenance procedures, methods of checking for normal safe operation, and procedures for safely starting and stopping in typed form, frame as specified above and post beside the diagrams. Post the framed instructions before acceptance testing.

#### 3.03 INSTALLATION

A. Provide finished work that is rigid, neat in appearance and free from defects. Install equipment plumb, level, and secured rigidly in place. Install doors and frames conforming to NAAMM HMMA 840. Install doors, frames, and hardware in strict compliance with approved printed instructions and detail drawings provided by the manufacturer. The Contractor is responsible for proper installing of the door assembly so that operating clearances and bearing surfaces conform to manufacturer's instructions. Install weatherstripping and thresholds at exterior door openings to provide a weathertight installation. Install all other components in accordance with approved manufacturer's recommended instructions. Test all operable parts of components for smooth, trouble-free operation, in the presence of the Contracting Officer. Submit Drawings containing complete wiring and schematic diagrams, where appropriate, and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Show proposed layout and anchorage of components and appurtenances, and relationship to other parts of work including clearances for operation and maintenance. Show conformance to all requirements, including fabrication details, sizes, thickness of materials, anchorage, finishes, hardware location and installation.

# 3.04 FASTENERS

A. Fasteners exposed to view must match in color and finish and must harmonize with the material to which fasteners are applied.

# 3.05 CORROSION PROTECTION - DISSIMILAR MATERIALS

A. Give contact surfaces between dissimilar metals and aluminum surfaces in contact with concrete, masonry, pressure-treated wood or absorptive materials subject to wetting, a protective coating in accordance with Section 09 90 00 PAINTS AND COATINGS.

# 3.06 ADJUSTING/CLEANING

A. Make adjustments to doors and pass-thru drawers to assure smooth operation. Units must be weathertight when closed and locked. Clean all components in accordance with manufacturer's instructions.

# END OF SECTION 08 3402

#### SECTION 08 3459 - VAULT DOOR

#### PART 1 - GENERAL

The General Services Administration has authorized the use of this federal specification by all federal agencies.

# 1. SCOPE AND CLASSIFICATION

- 1.1 <u>Scope</u>. This specification covers security vault doors which are designed to conform to the minimum standards for physical security equipment as required by the Information Security Oversight Office Directive governing the safeguarding of national security information. The doors provide protection against unauthorized entry for the periods of time specified in 1.2.1.
- 1.2 <u>Classification</u>. The vault doors under this specification shall be of the following classes, types, styles and designs, as specified (see 6.2).

# 1.2.1 Classes.

Class 5-A - Armory door shall be resistant to 30 man-minutes covert entry and 10 man-minutes forced entry.

# 1.2.2 Types.

Type IR - Right opening swing; with optical device. Type IIR - Right opening swing; without optical device.

# 1.2.3 Styles.

Style H - Hand change combination lock. Style K - Key change combination lock.

#### 1.2.4 Design.

Design S - Single lock.

Design B - No exterior hardware. (Types I and II only)

#### 2. APPLICABLE DOCUMENTS

2.1 <u>Government publications</u>. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issue in effect on the date of invitation for bids or request for quotation shall apply.

# Federal Specifications:

FF-L-2937 Lock, Combination.

QQ-C-320 Chromium Plating (Electro-deposited).

QQ-P-416 Plating, Cadmium, (Electro-deposited).

TT-C-490 Cleaning Methods and Pretreatment of Ferrous Surfaces for Organic Coatings.

# Federal Standards:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies). Fed. Std. No. 595 - Colors.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards and Handbooks as outlined under General Information in the Index of Specifications and Standards and at the price indicated in the Index. The index which includes cumulative supplements, as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC, 20402.

(Single copies of this Specification and other Federal Specifications are available from: General Services Administration, Federal Supply Service, Specifications Section (3FP-E), Suite

8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Tel - (202)619-8925.)

(Sample panels of the standard colors are obtainable, without charge, from the Business Service Center, Federal Supply Service, General Services Administration, Washington, DC 20407, or from the Business Service Center of the nearest Regional Office.)

# Military Standards:

MIL-STD-129 - Marking for Shipment and Storage.

(Copies of Military Specifications and Standards are available from: DODSSP - Customer Service, Standardization Document Order Desk, 700 Robbins Avenue, Bldg. 4D, Philadelphia, PA 19111-5094, Tel 215.697.2179)

2.2 <u>Other publications</u>. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on the date of invitation for bids or request for proposal, shall apply.

American National Standards Institute (ANSI)/American Society for Quality (ASQ): ANSI/ASQ Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to ANSI, 11 West 42<sup>nd</sup> Street, NY

10036.) <u>American Society for Testing and Materials (ASTM)</u>: VAULT DOOR

ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.

(Application for copies should be addressed to the American Society for Testing and Materials.

100 Barr Harbor Drive, West Conshohocken, PA 19428-

2959) Underwriters Laboratories (UL):

UL 752 - Standard For Safety For Bullet-Resistive Equipment.

UL 768 - Combination Locks: For locking control of safes, chests, vaults, and similar products.

(Application for copies should be addressed to Global Engineering Documents,15 Inverness Way, East Englewood, CO 80112, Telephone: (303)397-7956 (outside the U.S.), (800)854-7179 (U.S. and Canada) ,Fax: (303)397-2740)

National Motor Freight Traffic Association, Inc.,

Agent: National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Association, Inc., Traffic

Department, 1616 P Street, NW, Washington DC, 20036.)

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

# 3. REQUIREMENTS

3.1 <u>Qualification</u>. The vault doors furnished under this specification shall be products which have been tested and have passed the qualification tests and inspections specified in section 4, and have been listed on or approved for listing on the applicable Qualified Products List (QPL). The Government testing facility for the General Services Administration reserves the right to test the vault door in accordance with standards that are privileged to the Government.

# 3.1.1 Qualification suspension.

3.1.1.1 <u>Development of entry techniques</u>. The doors qualified under this specification will be continually tested by the Government during the term of qualification to determine whether the surreptitious, covert or forced entry protection afforded by the doors should or can be

improved. If at any time, entry techniques are developed within the framework of the specification which affect a door's security integrity, it shall be removed from the QPL.

- 3.1.1.2 <u>Change in specification requirements</u>. This specification will be reviewed by the Government to determine whether the specification requirements should or can be changed to improve product quality. If, at any time, requirements are changed and such changes affect the qualification status of a qualified door, it shall be removed from the QPL and the manufacturer will be required to modify the product to the extent necessary to comply with specification changes and have the product requalified.
- 3.2 <u>Materials</u>. Materials used in the door's construction shall be as specified herein. Materials not specified shall be of good commercial quality, suitable in all respects for the purpose intended.
- 3.2.1 <u>Steel</u>. Steel used in the door shall be of the type, thickness and strength to meet all applicable requirements of this specification. Steel shall be free from rust, scale, pits, buckles and other imperfections that might adversely affect the appearance or the serviceability of the finished product.
- 3.2.2 Face hardware. The face hardware, excluding combination locks, shall be satin finished anodized aluminum, type 430 corrosion resistant steel or satin finished chromium plating on steel or on die-cast zinc, brass or bronze. The exposed surfaces of all hardware used on a single unit shall be finished to match each other within the limits of the base material and protective coating used. The exposed surfaces of all face hardware shall be free of sharp edges, burrs, pits, nicks or scratches that penetrate the protective plating or anodizing.

# 3.2.3 Finishing materials.

- 3.2.3.1 Enamel and lacquer. The final coat for the door shall be either baked enamel, air dried, textured finish, powder coat finish, nitrocellulose lacquer or water reducible coating. The quality of the final coat and its application shall be in accordance with good commercial standards and practices. The color shall be gray, color No. 26134, of Federal Standard No. 595.
- 3.2.3.2 <u>Chromium plating</u>. Chromium plating shall be in accordance with Class I, Type II of QQ-C-320.
- 3.2.3.3 <u>Cadmium plating</u>. Cadmium plating shall be in accordance with Class 1, Type I of QQ-P-416.
  - 3.2.3.4 Zinc plating. Zinc plating shall be in accordance with ASTM B633.
  - 3.3 Construction and design.
- 3.3.1 <u>Design</u>. The design shall provide for an end product that is practical, durable, and acceptable in general appearance. The doors shall be hinged to swing right or left, as specified (see 6.2).

- 3.3.2 Assembly. The door frame shall be considered a part of the door for purposes of entry resistance testing and shall afford the same security protection as that of the door. Protection for the extended locking bolts shall be built into the door frame. The overall width of the door frame shall not exceed the width of the clear door opening by more than 410 mm. The door frame for single leaf doors shall be designed to mount in a structural wall opening ranging from 1190 to 1240 mm wide and 2080 to 2110 mm high. The door shall be assembled in such a manner as to preclude the removal or loosening of any of the door's components when the door is closed and locked, except that the hinges shall be removable from the outside. All welding and brazing shall be sound, without porosity and shall accomplish secure and rigid joints in proper alignment. All protruding or depressed welds on the door's exterior surface shall be filled and sanded or ground smooth. The door and frame shall be in perfect alignment and operation of the locking mechanism, including the locking bolts, shall be smooth and positive without binding or jamming of parts. The door shall withstand the test in 4.4.8.1.
- 3.3.3 <u>Clear door opening</u>. The vault door assembly shall be of one size. When installed, the single leaf door shall have a clear door opening of 1980 mm high and 1015 mm wide. A forming tolerance of  $\pm 3$  mm shall be permitted. Other door sizes may be approved at the request of the manufacturer based upon documented agency requirements.
- $3.3.4 \, \underline{\text{Wall thickness}}$ . The door assembly shall be adaptable to one of the following wall thicknesses, as specified (see 6.2): 150 mm; 205 mm; 255 mm; or 305 mm. The assembly design shall provide a  $\pm 15$  mm adjustment to allow for variations in the nominal wall thickness (see 6.4).
- 3.3.5 <u>Door frame</u>. The door frame shall be non-grout type and the frame and door shall be mounted so that there shall be not more than 3 mm clearance between the door and the door frame. The frame shall be designed so that when attached to the wall, the wall clamping bolts will be exposed only on the inside of the vault. The frame shall have leveling and adjusting screws to compensate for building sag which may occur at any time in the future.
- 3.3.6 Door pull and throw bolt handles. The door pull and throw bolt handles shall be of the material specified in paragraph 3.2.2. They shall be not less than 100 mm in length and of designs consistent with their intended usage. The handles shall be without burrs, nicks, scratches, and sharp edges. A door pull shall be securely and firmly attached to both the door front and the door interior. Throw bolt handles shall be firmly attached to the front of the door. Door pulls and throw bolt handles shall be attached so they withstand loosening in testing and in operation during the service life of the door. The door pull handle on the front of the door may be integral with the throw bolt handle. Removal of the handle arbor shall be controlled only from the inside of the door. The throw bolt handle shall require not more than 20 Newton-meters torque to engage or disengage the boltwork mechanism, and the initial force required to swing the unlocked door from any position shall not exceed 45 Newtons at the operating handle.
- 3.3.7 <u>Door stop</u>. A door stop to prevent the door's face hardware from striking wall surfaces shall be furnished with the door. The stop shall be designed to be wall mounted

unless otherwise specified (See 6.2). The stop shall be able to withstand hard usage. The stop shall not scratch or scar the door's painted finish when the door is swung open against it.

- 3.3.8 <u>Door striker</u>. The door shall have a striker on both the front and hinged edges to minimize play or shake in the door when in the locked condition. The fit of the door to the striker on both the front and hinged edges shall be such that there is not more than 1 mm play or shake in the door when the bolts are thrown to the locked position.
- 3.3.9 <u>Door hinges</u>. The door shall be mounted to the frame by not less than two antifriction bearing hinges, so designed to allow the door to be opened approximately 180 degrees. The hinges shall be removable from the outside.
- 3.3.10 <u>Door threshold</u>. The door threshold shall be designed to provide a ramp at the door threshold of approximately 6 mm to permit free swing of the door after its installation. If receptive cups, ports, or grooves are used, they shall be recessed not less than 12 mm below the bolt in its extended position to prevent dirt or other substances from obstructing the locking mechanism.
- 3.3.11 <u>Back cover plate</u>. Back cover plates of not less than 1.5 mm thickness shall completely enclose the back of the door. The back plates shall be firmly and securely fastened to the door and shall be reinforced or attached by a method to prevent sagging, bulging, or distortion. The back plates shall be easily removed by one person for service purposes by the use of common hand tools and shall weigh less than 20.4 kg (45 lbs). The back shall have an opening covered by an inspection plate. The opening, with the inspection plate removed shall be large enough and positioned so as to allow maintenance of the door's combination lock and cam assembly.
  - 3.4 Lock. The lock shall be in accordance with the following paragraphs:
- 3.4.1 <u>Combination lock.</u> Class 5A doors, shall have a Style H or Style K lock, as specified (see 6.2). The lock shall meet the requirements of FF-L-2937. The lock design or installation shall not compromise the integrity of the door.
- 3.4.2 <u>Armory door lock</u>. Class 5A, Design S doors, shall have a lock which is UL listed in accordance with Group 1 of UL 768. The lock design or installation shall not compromise the integrity of the door.
- 3.4.3 <u>Lock installation</u>. The lock's dial ring shall be mounted so as to be flush to the surface of the door. The attachment of the dial ring shall be firm and secure without movement or side play. The lock case shall be firmly and securely attached to the door by suitable and effective means so that there is no movement or side play to the lock case. The lock shall not be modified in any manner from the formation supplied by the lock manufacturer, except that the spindle may be cut to proper length.
- 3.5 <u>Locking mechanism</u>. The engaging bolts shall be of a design, size and material strength to withstand the applicable tests in Section 4. The bolts shall operate easily and

smoothly, without binding or jamming. The bolts shall not dent or otherwise deface the door frame in their movement. The attaching linkage shall be channeled, strapped or welded. The locking mechanism shall have a detent to lock the bolts in the open position when the bolts are retracted and the door swung open. The detent shall be designed so that it cannot be inadvertently tripped, permitting the bolts to be thrown to the engaged position. The locking mechanism shall be designed such that, with the vault door in the open position, the lock can be locked so when the door is pulled shut from the inside, the vault door will immediately lock in the closed position.

- 3.6 <u>Locking mechanism and lock mounting drawings</u>. Complete, exploded view drawings of the locking mechanism and lock mounting, with individual parts indexed, shall be furnished by the manufacturer upon specific request of the purchaser.
  - 3.7 Resistance to entry techniques.
- 3.7.1 <u>Surreptitious, covert and forced entry techniques</u>. The vault door shall withstand the applicable tests in 4.4.8 for not less than the periods of time specified hereunder.
- Class 5-A Armory door shall be resistant to 30 man-minutes covert entry and 10 man-minutes forced entry.
  - 3.8 Ballistic resistance. The Class 5A doors shall pass the test in 4.4.8.4.
- 3.9 Escape device. Each vault door shall have an escape device which shall be permanently installed on the inside face of the door. The device shall permit ready escape for persons locked inside the vault area. Access to the device shall only be from the inside the vault, and its design shall be such that under normal operating conditions it cannot be activated from the outside. A decal shall be permanently affixed to the inside face of the door frame outlining, in easily read letters, completely understandable instructions for activating the device to open the door. Neither the design of the device nor its installation shall affect the door's resistance to entry techniques. The escape device shall allow the door to be returned to the fully secure condition following egress from the vault. The escape device shall pass the escape device operational test in paragraph 4.4.8.5.
- 3.10 Optical device. When specified, the door shall have a wide angle optical device. The purchaser should indicate whether the device should permit observation from inside to outside of the vault or vice versa (See 6.2). The optical device shall be installed in such a manner so as not to affect the door's security protection. The device shall be located in the door approximately five feet above the inside vault floor and as close to the center of the door as practicable. However, in no case shall it be closer than 205 mm to the clear opening edge of the door either on the hinged or front edge.
- 3.11 <u>Lubrication</u>. Moving parts requiring lubrication shall have a permanent type lubricant applied which is suitable to the varied climatic conditions likely to be encountered during the service of the product.

#### 3.12 Pretreatment and finish.

- 3.12.1 <u>Pretreatment</u>. All exterior and interior ferrous metal surfaces shall be treated for painting in accordance with any type in TT-C-490. Special attention shall be given to the door's interior to assure all welds are clean and that all slag, spatter, and dirt accumulation is removed.
- 3.12.2 Finish. The final coat used for the finish shall be as specified in 3.2.3.1 and it shall be applied to all exterior and interior metal surfaces except plated metal. The minimum total finished film thickness of the final coat shall be not less than 0.025 mm. The finish shall level out to produce uniform exposed surfaces without runs, wrinkles, grit, areas of thin or no film, or separation of color. A textured or crinkle finish may be used. Special attention shall be given to insure that all surfaces are adequately protected against rust. The final finish shall withstand the test in 4.4.8.5 without evidence of cracking, flaking, or loss of adhesion of the finish. Two test panels of 0.9 mm thick steel shall be furnished with the sample door for the purpose of the test. One panel shall be prepared to reflect the inner coating and one to reflect the outing coating.
- 3.12.3 <u>Plating</u>. Bolts, screws, nuts, and similar hardware shall be made to resist rust by electrogalvanizing or by zinc, cadmium, or chromium plating as specified in 3.2.3.
- 3.13 <u>Labels</u>. Each door furnished under this specification shall bear the applicable labels specified hereunder.
- 3.13.1 <u>General Services Administration label</u>. The label shall be affixed to the outside face of the door. The label shall have a silver background and red letters not less than 3 mm in height. The label shall show the following:

# GENERAL SERVICES ADMINISTRATION APPROVED SECURITY VAULT DOOR MANUFACTURER'S NAME

- 3.13.2 <u>Identification label</u>. The label shall be affixed to the inside face of the door frame. The label shall show the door model and serial number, date of manufacture, and Government contract number.
- 3.13.3 <u>Certification label</u>. A certified label shall be affixed to the inside face of the door bearing the following certification:

# A. For the Class 5-A door:

"This is a U.S. Government Class 5-A armory door which has been tested and approved by the Government under Fed. Spec. AA-D-600D(4). It affords the following security protection:

"30 man-minutes against covert entry.

10 man-minutes against forced entry.

The protection certified above applies only to the door and not to the vault proper."

# **Ballistic Resistant**

The protection certified above applies only to the door and not to the vault proper." 3.13.4 Number label. All vault doors shall have a number label securely affixed to the front face. Regardless of the method used, the label attachment shall not degrade the door security. The label shall be mounted on the door frame, above or to the left side of the door. The label shall be nominal 0.5 mm thick, satin finished aluminum and shall be 63-65 mm by 17-20 mm. The label numbering system shall be established by the manufacturer to provide non-repetitive numbers. The label numbers shall be not less than 4.5 mm high and shall be embossed.

3.14 Workmanship. The workmanship shall be of a quality to produce a serviceable and well finished end item, able to withstand hard daily usage. The edges of all exposed parts and sheets shall be protected by folding, beading, flanging or grinding to eliminate burrs, roughness, and sharp edges. The bending of channels and flanges shall be straight and smooth. Welding and brazing shall produce secure and rigid connections. Lock washers, cotters pins, clips, and other retainers or built-in features shall be used to prevent loosening of screws, bolts, and nuts which may cause disengagement of parts and possible lock-out. Moving parts shall operate smoothly without binding or jamming. The door shall be free of any defects or features which may adversely affect its appearance and serviceability or which may cause personal injury.

Table I - Classification of Preparation for Delivery Defects

rable 1 Classification of 1 reparation for Benvery Beleets		
Examine	Defect	
Markings	Omitted; incorrect; illegible; improper size, location, sequence or method of application.	
Materials	Any component missing or damaged.	
Workmanship	Incomplete closure of box, loose strapping, distortion of container.	

- 3.15 <u>Replacement of parts</u>. Parts subject to replacement, such as the combination lock and face hardware, shall be capable of identical replacement in the field without the use of special tools or specially qualified personnel and shall be possible without affecting the security integrity of the door.
- 3.16 <u>Spare parts list</u>. A spare parts list of all door parts which may be subject to subsequent replacement shall be furnished with each door delivered under contract. The parts list shall clearly identify the parts by descriptions and part numbers. The list shall be printed on paper or other suitable material and bonded by glue or adhesive to the inside face of the door frame.

#### 4. QUALITY ASSURANCE PROVISIONS

- 4.1 <u>Inspection responsibility</u>. Except that testing for qualification shall be performed by an agency designated by the General Services Administration, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own or any other inspection facility or service acceptable to the Government. Inspection records of the examinations and tests shall be kept complete and available to the Government, as specified in the contract or order. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.
- 4.2 <u>Component and material inspection</u>. In accordance with 4.1, the supplier is responsible for insuring that components and materials used are manufactured, tested, and inspected in accordance with the requirements of referenced subsidiary specifications and standards to the extent specified, or, if none, in accordance with this specification.
- 4.3 <u>Inspection of preparation for delivery requirements</u>. An inspection shall be made to determine that the packing and marking comply with the requirements in Section 5 of this specification. Defects shall be in accordance with Table I. The sample unit shall be one shipping container fully prepared for delivery.
  - 4.4 Testing procedures and tests.
- 4.4.1 <u>Testing agency</u>. Qualification tests on doors submitted for approval for inclusion on the applicable Qualified Products List (QPL) and any re-testing that may be required shall be performed by a testing agency specifically designated by the General Services Administration.
- 4.4.2 <u>Testing costs</u>. All testing costs entailed in determining the qualification of the supplier's product, including costs of re-testing of a qualified product if subsequently disqualified under 3.1.1, shall be borne by the supplier, and shall be paid prior to the commencement of testing. Test fees shall be payable to the testing agency or the General Services Administration, as directed by the General Services Administration.
- 4.4.3 <u>Test procedures</u>. The following procedures shall govern the testing of all doors submitted for qualification under this specification.
  - (a) Samples shall be submitted for qualification only after the supplier has obtained written authorization from the General Services Administration.
  - (b) A qualification test may be discontinued at the Government's testing facility at any time the product fails to meet any one or more of the requirements set forth in this specification. The manufacturer may be permitted to make modifications on the sample during the testing phase where such modifications, in the judgement of the General Services Administration and the testing facility, are clearly in the interest of the Government.
  - (c) In case of failure of the sample, consideration will be given to the request of the manufacturer for resubmission for retest only after it has been clearly shown that changes have been made in the product which the Government considers sufficient to warrant retest.

- (d) The manufacturer or his representative will not be permitted to observe the actual tamper resistance tests conducted on his product at the testing facility. However, when samples tested fail to comply with the requirements of this specification, the sample may be examined by the manufacturer or his representative and full details of the failure may be made known to them in a manner which, for reasons of security, will be in the best interest of the Government.
- 4.4.4 <u>Test samples</u>. Qualification test sample representative of the classes, types and designs of the class the supplier proposes to furnish shall be forwarded at a time and to a place designated by the General Services Administration. During testing, in the event the sample is destroyed or damaged to such an extent that the testing cannot be completed, the Government reserves the right to require the manufacturer to furnish additional samples to complete the testing.
- 4.4.5 <u>Drawings and material specifications</u>. The manufacturer shall furnish two complete sets of construction and assembly drawings and material specifications with the sample submitted for qualification. When samples have been tested and are approved for inclusion on the applicable QPL, the manufacturer shall furnish three additional complete sets of the assembly and construction drawings and material specifications lists to the General Services Administration for the Government's use in inspection and acceptance of the product after award of contract. All material so furnished by the manufacturer will be held in proprietary confidence.
- 4.4.5.1 <u>Changes in drawings and material specifications</u>. Once the door has been tested and approved for QPL, no change of any kind shall be made in its construction or in the construction drawings unless prior written authorization to make the change is obtained from the Federal Supply Service, General Services Administration. Upon receipt of a request for a change, the General Services Administration will determine whether additional testing is required for approval.
- 4.4.6 <u>Qualification testing</u>. Qualification testing shall consist of the following tests and inspections. Failure of the sample to withstand these tests shall provide reason to consider the product as having failed to meet qualification requirements.
  - (a) Inspections 4.4.9
  - (b) Door test 4.4.8.1
  - (c) Surreptitious, covert and forced entry test 4.4.8.2
  - (d) Ballistic Test 4.4.8.3
  - (e) Finish Test 4.4.8.4
  - (f) Escape Device Operational Test 4.4.8.5
- 4.4.7 <u>Acceptance after award of contract</u>. The Government reserves the right to inspect and test each door, including all component parts thereof, delivered for acceptance under this specification after award of contract.
  - 4.4.8 Test methods.

- 4.4.8.1 <u>Door test</u>. The vault door shall be suspended in a test frame and swung open 90 degrees from its closed position. Ninety kilograms shall be loaded on the top edge of the door opposite and furthermost from the hinged side. The door shall be allowed to hang in this position for approximately 24 hours. At the end of this period, the door shall be examined for ease of operation. The door shall not stick or jam in its frame and the lock and locking mechanism shall operate easily and smoothly.
- 4.4.8.2 <u>Surreptitious</u>, <u>covert and forced entry test</u>. There shall be sufficient time and opportunity to study the design and construction of the vault door and to develop testing methods prior to the start of testing. There shall be no limit to the number of methods of surreptitious, covert and forced entries attempted. No more than two men shall be used simultaneously during each attempt at entry. The man-minute working time shall cover the period during which an entry test on the cabinet is in progress and shall be exclusive of time required for safety precautions and rest periods.
  - 4.4.8.2.1 <u>Surreptitious</u>, covert and forced entry tools and devices.
- 4.4.8.2.1.1 <u>Surreptitious entry tools and devices</u>. Tools and devices used in the surreptitious entry tests are unlimited, except that the total weight of the tools used for a single test shall not exceed 70 kilograms. The test tools and devices selected for a particular attempt shall be weighed prior to commencement of the test.
- 4.4.8.2.1.2 Covert entry tools and devices. The tools and devices used in the covert entry tests shall be limited as specified below. Power tools, electrically or battery powered shall be commercially available equipment, and shall be limited to drills not exceeding 5000 rpm. Pressure rigs may be used, with a lever arm not exceeding 762 mm. Tools may be reasonably modified, i.e., special chucks on drills, ground or shaped chisels or pry bars, etc. Electrical tools shall be able to operate on electricity available in normal office space. Tools and devices shall be capable of being carried in two cases or bags, each case or bag not exceeding 0.042 cubic meters in volume. The total weight of the tools used in a single test shall not exceed 70 kilograms, exclusive of the weight of the case. Devices for the application of heat shall be limited to single tank propane, butane or equivalent devices which fall with the weight and dimension limits specified above. Acetylene, MAPP or equivalent shall not be used. Electric arc or any form of burn bars, oxidizer assisted products or explosives shall not be used. The test tools and devices selected for a particular attempt shall be weighed prior to commencement of the test.
- 4.4.8.2.1.3 <u>Forced entry tools and devices</u>. The tools and devices used for forced entry tests shall be limited to non-powered tools only. The test tools and devices selected for a particular attempt shall be weighed prior to commencement of the test.
- 4.4.8.2.2 <u>Surreptitious</u>, <u>covert and forced entry test timing</u>. The time clock shall be started when the test equipment is picked up to approach the sample and shall not be stopped during the test except as specified above. Any change or repair of tools taken from the carrying case during a test shall only be done while the clock is running. The tests must be conducted in a manner that is repeatable. Any surreptitious, covert, or forced entry through the vault door

under the above conditions, within the time specified for the door's class, shall provide reason to consider the door as having failed to meet the requirement.

- 4.4.8.3 <u>Ballistic resistance test.</u> The vault door shall be tested in accordance with level 2 small arms ballistic protection testing in accordance with the procedures specified in paragraph 3.2 of state department standard SD-STD-01.01, Revision G (Amended) dated November 30, 1992 amended April 30, 1993. Any failure of the tested item to comply with the criteria of paragraph 3.4.1 Ballistic Rejection Criteria of SD-STD-01.01 shall be cause for rejection.
- 4.4.8.4 <u>Finish test</u>. The two panels, prepared as specified in 3.13.2 shall, at room temperature, be bent around a 6.4 mm rod to an angle of 180 degrees. The panels shall then be examined for compliance with 3.13.2.
- 4.4.8.5 <u>Escape device operational test.</u> The escape device shall be subjected to 10,000 cycles of operation without addition of lubricants and without replacements of any component. One cycle shall consist of using the escape device to throw the bolts and open the vault door, and then close and lock the vault door. Any failure of the escape device during test shall be cause for rejection.
- 4.4.9 <u>Inspection</u>. A visual inspection shall be made of the product to determine compliance with the requirements specified in Section 3.

# 5. PREPARATION FOR DELIVERY

- 5.1 Packing. Packing shall be level A, B or C, as specified (see 6.2).
- 5.1.1 <u>Level A</u>. Each complete door shall be packed in a crate or in a box. When packed in a crate, the contents shall be waterproof shielded with a shroud. When packed in a box, the contents shall be shrouded and the box shall be modified with addition of reinforcing members and skids. The contents of the crate or box shall be blocked, braced and cushioned to prevent movement during multiple shipments.
- 5.1.2 <u>Level B</u>. Each complete door shall be packed in a crate or in a box. Unless otherwise specified (see 6.2), shrouding of the contents shall not be required. The contents of the crate or box shall be blocked, braced, and cushioned to prevent movement during shipment.
- 5.1.3 <u>Level C</u>. Each complete door shall be packed to assure carrier acceptance and safe delivery to destination in containers complying with the rules and regulations applicable to the mode of transportation.
  - 5.2 Marking.
- 5.2.1 <u>Civil agencies</u>. In addition to the marking required in the contract or order, the shipping containers shall be marked in accordance with Fed. Std. No. 123.
- 5.2.2 <u>Military activities</u>. In addition to markings required by the contract or order, the shipping containers shall be marked in accordance with MIL-STD-129.

#### 6. NOTES

- 6.1 <u>Intended use</u>. The doors are intended for use in storage vaults and strong-rooms to protect against unauthorized passage of a person or persons through the doorway into the vault proper.
- 6.2 <u>Ordering data</u>. Purchasers should exercise any desired options offered herein, and procurement documents should specify the following:
  - (a) Title, symbol and date of this specification.
  - (b) Class, type, style, and design required.
  - (c) Thickness and composition of the vault wall.
  - (d) Door stop requirements if other than wall mount.
  - (e) Levels of packing and marking required.
- 6.3 <u>Qualification</u>. With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion on the applicable Federal Qualified Products List, whether or not such products have actually be so listed by that date. The attention of suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification so that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Furniture Commodity Center, Federal Supply Service, General Services Administration, Washington, D.C. 20406, and information pertaining to qualification may be obtained from that activity.
- 6.4 <u>Composition of vault wall</u>. Examples of materials commonly used in vault construction are reinforced concrete, interlocked hard brick, steel alloy, or a combination of these. In order that the door manufacturer can insure a proper fit, the purchaser should stipulate in the purchase order (see 6.2) the thickness and the type of material used in the vault wall.
  - 6.5 Definition of terms used in this specification.
- 6.5.1 Entry. For the purpose of this specification, entry means: (1) opening the door, (2) creating an opening to allow passage through the vault door or wall opening in which the door is mounted.
- 6.5.2 <u>Surreptitious entry</u>. For the purpose of this specification, surreptitious entry means a method of entry, such as lock manipulation or radiological attack on the combination lock, which would not be detectable during normal use or during inspection by a qualified person.
- 6.5.3 <u>Covert entry</u>. For the purpose of this specification, covert entry is defined as a method of entry which causes physical damage to the door or lock such that the damage can be repaired to the point where it would not be detectable by a user during normal use. However, the damage would be detectable during inspection by a qualified person. If replacement parts, including replacement lock parts, or paint, are necessary to conceal the

damage caused by the entry attempt so it cannot be detected during normal use, the entry method shall be considered covert.

- 6.5.4 <u>Forced entry</u>. For the purpose of this specification, forced entry means a method of entry which would leave evidence of the act and which would be readily discernible in the normal use of the door. Forced entry is considered to be an attack in which the attacker has no concern over leaving evidence that the vault door has been penetrated.
- 6.5.5 <u>Lock manipulation</u>. For the purpose of this specification, lock manipulation is defined as the opening of the combination lock without alteration of the physical structure, or disarranging of parts. Ordinarily, manipulation would be accomplished by movement of the lock dial.
- 6.6 <u>Samples</u>. All samples required for test purposes shall be furnished at no expense to the Government and the manufacturer shall pay all transportation charges to and from the point where the tests are performed. All tested samples shall become the property of the Government but may be released to the manufacturer at the option of the Government. Upon request, the manufacturer shall furnish to the Government a door equal in every respect to that of the qualified sample for use of inspection during the term of the contract. The door shall be furnished at no expense to the Government and will be returned to the manufacturer at his request upon expiration of his contract.
- 6.7 <u>Special techniques</u>. Information relating to special techniques used in the testing of vault doors will be disclosed to qualified suppliers and personnel of the Federal agencies on an official, need-to-know basis.

#### END OF SECTION

# SECTION 08 4113 - FIRE-RATED ALUMINUM FRAMED ENTRANCES AND STOREFRONTS

# **PART 1 GENERAL**

#### 1.01 SUMMARY

# 1.02 REFERENCE STANDARDS

- A. 16 CFR 1201 Safety Standard for Architectural Glazing Materials; current edition.
- B. ANSI Z97.1 American National Standard for Safety Glazing Materials Used in Buildings Safety Performance Specifications and Methods of Test; 2015.
- C. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials; 2015.
- D. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- E. ASTM E1300 Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.
- F. ASTM F588 Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2017.
- G. ASTM F2248 Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass; 2012.
- H. NFPA 80 Standard for Fire Doors and Other Opening Protectives; 2016.
- I. NFPA 252 Standard Methods of Fire Tests of Door Assemblies; 2012.
- J. NFPA 257 Standard on Fire Test for Window and Glass Block Assemblies; 2017.
- K. NFRC 100 Procedure for Determining Fenestration Product U-factors; 2017.
- L. NFRC 200 Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2014, with Errata (2017).
- M. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings; 2012.
- N. UL 9 Standard for Fire Tests of Window Assemblies; Current Edition, Including All Revisions.

- O. UL 10B Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- P. UL 10C Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- Q. UL 263 Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.
- R. UL 752 Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

#### 1.03 SUMMARY

- A. Section Includes: Fire resistive framing system.
  - 1. GPX® Architectural Series Framing fire resistive, temperature rise, framing system with aluminum or decorative cladding for 45-120 minute interior applications.
- B. Applications of fire rated framing includes:
  - 1. Vision lites in fire rated doors, full vision fire rated doors, sidelites, borrowed lites, transoms and transparent walls with fire rating requirement as specified.

# 1.04 RELATED SECTIONS

- A. Section 08 8000: Glazing
- B. Section 08 8814: Fire-Rated Glazing
- C. Section 08 11 13: Hollow Metal Doors and Frames
- D. Section 08 4313: Aluminum Doors and Frames
- E. Section 08 12 16.13: Fire-Rated Aluminum Frames
- F. Section 08 43 13: Fire-Rated Aluminum Storefronts
- G. Section 08 7100: Door Hardware
- H. Section 08 8813: Fire Rated Glazing 60 minute
- I. Section 08 8814: Fire Rated Glazing 120 minute

#### 1.05 REFERENCES

A. American Society for Testing and Materials (ASTM):

Huntsville, AL

- 1. ASTM E119 Methods for Fire Tests of Building Construction and Materials.
- 2. ASTM E152 Methods of Fire Tests of Door Assemblies.
- 3. ASTM E163 Methods for Fire Tests of Window Assemblies.
- 4. ASTM E2074: Standard Test Method for Fire Tests of Door Assemblies, including Positive Pressure Testing of Side-hinged and Pivoted Swinging Door Assemblies.
- B. ASTM E2110-1: Standard Test for Positive Pressure of Fire Tests of Window Assemblies.
  - 1. ASTM E283-04: Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.
  - 2. ASTM 547-00: Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Difference.
  - 3. ASTM E331-00: Standard Test Method for Metal Curtain Walls and Doors by Uniform Static Air Pressure Difference.
  - 4. ASTM E330-02: Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- C. ASTM F 588-04: Test Method for Resistance of Window Assemblies to Forced Entry Excluding Glazing.
- D. National Fire Protection Association (NFPA):
  - 1. NFPA 80: Fire Doors and Windows.
  - 2. NFPA 251: Fire Tests of Building Construction and Materials.
  - 3. NFPA 252: Fire Tests of Door Assemblies.
  - 4. NFPA 257: Fire Tests of Window Assemblies.
- E. Underwriters Laboratories, Inc. (UL):
  - 1. UL 9: Standard for Safety of Fire Tests of Window Assemblies.
  - 2. UL 10B: Standard for Safety of Fire Tests of Door Assemblies.
- F. UL 10C: Standard for Safety of Positive Pressure Fire Tests of Door Assemblies.
  - 1. UL 263: Fire Tests of Building Construction and Materials.
  - 2. UL 752-2005: Standard for Safety for Bullet-Resisting Equipment.

- G. Standard Council of Canada (ULC):
  - 1. ULC Standard CAN4-S101: Fire Tests of Building Construction and Materials.
  - 2. ULC Standard CAN4-S104: Fire Tests of Door Assemblies.
  - 3. ULC Standard CAN4-S106: Fire Tests of Window Assemblies.
- H. Consumer Product Safety Commission (CPSC):
  - 1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials.
- I. American National Standards Institute (ANSI):
  - 1. ANSI Z97.1: Safety Glazing Materials Used in Buildings Safety Performance Specifications and Methods of Test.
- J. Glass Association of North America (GANA)
  - 1. GANA Glazing Manual.
  - 2. FGMA Sealant Manual.
- K. National Fenestration Rating Council (NFRC)
  - 1. NFRC 100: Procedure for Determining Fenestration Product U-Factors.
  - 2. NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
- L. American Recovery and Reinvestment Act
  - 1. Section 1605, Title XVI Buy American Provision]
- M. IBC 2018

# 1.06 SYSTEM DESCRIPTION

- A. Performance Requirements:
  - 1. Fire Rating: must meet 60, 90 or 120 minutes as specified see door schedule.
  - 2. Fire Resistive Wall Assembly Certifications: must meet 60-120 minute fire resistive wall assemblies tested in accordance with ASTM E119, NFPA 251, UL 263 and ULC-S101.
  - 3. Fire Resistive, Temperature Rise Door Assembly Certifications: must meet 60-90 minute fire resistive temperature rise door assemblies tested in accordance with

NFPA 252, UL 10B, UL 10C and CAN4 S104. Must meet 250 degrees F/450 degrees F temperature rise door requirements.

- 4. Uniform Load Deflection Test Pressure: up to +/- 50.0 psf
- 5. Uniform Load Structural Test Pressure: up to +/- 75.0 psf
- 6. Forced Entry Resistance: must meet ASTM F588 Type D
- 7. FIRST's NFRC CMAST document for examples of simulations based on available glazing materials in the NFRC CMAST database.
- 8. Testing Laboratory: Fire test must be conducted by a nationally recognized independent testing laboratory.
- 9. Glazing: Fire resistive glazing in 60-90 minute fire resistance doors and openings up to the maximum size tested. Fire resistive glazing that meets ASTM E-119/UL 263/ULC- S101 up to the max. size tested. All glazing used in doors, sidelites or any hazardous location must meet CPSC Cat. I or II impact safety.
- 10. Max. Door Opening Sizes: must meet up to 4'0" wide x 9'0" high for single doors and 8'0" wide by 9'0" high in pair doors. No intermediate rails required.

# B. Listings and Labels:

1. Fire resistive, temperature rise framing system shall be under current follow-up service by a nationally recognized independent laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

# C. Appearance:

1. Fire rated wall/door assembly shall have a neat finished appearance with minimum joints at decorative cover intersections.

#### 1.07 SUBMITTALS

- A. Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedure Section.
- B. Shop Drawings: Submit shop drawings showing layout, profiles and product components.
  - 1. Samples: Submit samples for finishes, colors and textures.

C. Technical Information: Submit latest edition of manufacturer's product data providing product descriptions, technical data and installation instructions.

# 1.08 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with Division1 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials to specified destinations in manufacturer's or distributor's packaging undamaged, complete with installation instructions.
- D. Storage and Protection: Store off ground, under cover, protected from weather and construction activities and at temperature conditions recommended by manufacturer.

# 1.09 FABRICATION DIMENSIONS

A. Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

# 1.10 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is not intended to limit other rights that the Owner may have under the Contract Documents.
  - 1. Warranty Period: 5-year limited warranty from date of substantial completion.

# **PART 2 PRODUCTS**

# 2.01 MANUFACTURERS – FIRE RATED (DOOR) (OPENING) (WALL ASSEMBLY)

- A. Manufacturer of Framing System: GPX Architectural Series Framing as manufactured and distributed by SAFTI FIRST® Fire Rated Glazing Solutions.
  - 1. Contact: 100 N Hill Drive, Suite 12, Brisbane, CA 94005; Telephone 888.653. 3333; email info@safti.co; Web site www.safti.com basis of design.
- B. Manufacturer of Glazing Material: SuperLite® II-XL as manufactured and distributed by SAFTI FIRST® Fire Rated Glazing Solutions.

- 1. Type FRG-1 60 Minute Glazing
- 2. Type FRG-2 90 Minute Glazing
- 3. Type FRG-3 120 Minute Glazing
- 4. Contact: 100 N Hill Drive, Suite 12, Brisbane, CA 94005; Telephone 888.653. 3333; Fax 888.653.4444; email info@safti.co; Web site www.safti.com
- C. Fire rated glass and framing must be provided by a single-source, US manufacturer. Distributors of fire rated glass and framing are not to be considered as manufacturers. Materials for the project should be shipped together in the same shipment on the same truck.
- D. Substitutions: No substitutions allowed.

# 2.02 MATERIALS – FRAMING

A. Fire resistive, temperature rise framing system rated for 60 to 120 minutes.

# Properties:

- 1. Window/Wall Frame thickness: 2-1/2" Standard. 3", 4-1/8" and 5" also available. Door profile thickness: 5" Standard.
- 2. Fire resistive aluminum door capable of accommodating concealed hardware.
- 3. Internal framing: Internal tube steel framing shall conform to ASTM A501. Formed steel retainers shall be galvanized conforming to ASTM A527.
- 4. Insulation: The framing system shall insulate against the effects of fire, smoke and heat transfer from either side. The perimeter of the framing system to the rough opening shall be firmly packed with mineral wool fire stop insulation or appropriately rated intumescent sealant.
- 5. Fasteners: Type recommended by manufacturer. No exposed fasteners allowed.
- 6. Glazing accessories: The glazing material perimeter shall be separated from the perimeter framing system with approved flame retardant glazing tape. The SuperLite® glazing panel shall be caulked continuously around the edge to the tube steel frame utilizing neutral cure silicone. Silicone setting blocks recommended.
- 7. SAFTI FIRST listing allows for doors by others.

#### 2.03 MATERIALS – GLASS

A. Assemblies shall be glazed with SuperLite® glazing products. If assembly is required to meet ASTM E 119/UL 263/ULC-S101, SuperLite® II-XL will be used.

# B. Properties:

- 1. Individual Lites shall be permanently identified with a listing mark.
- Glazing material installed in "Hazardous Locations" (subject to human impact) shall be certified to meet the applicable requirements for fire rated assemblies referenced in ANSI Z97.1 Standard for Safety Glazing Materials Used In Buildings and/or CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
- 3. Temperature rise on the unexposed side of glazing material shall be limited to 250 degrees Fahrenheit when required.
- 4. Visible Transmittance: Varies by glazing type. Must meet:

SuperLite ® II-XL 60 Starphire®	0.877
SuperLite ® II-XL 90 Starphire®	0.875
SuperLite ® II-XL 120 Starphire®	0.878

5. STC/OITC rating: Varies by glazing type. Must meet:

SuperLite® II-XL 60 & SuperLite® II-XL 60 Starphire®	STC 43/OITC 39
SuperLite® II-XL 90 & SuperLite® II-XL 90 Starphire®	STC 44/OITC 40
SuperLite® II-XL 120 & SuperLite® II-XL 120 Starphire®	STC 44/OITC 40

- 6. Pressure glazing is acceptable.
- C. Logo: Each piece of fire rated glazing shall be labeled with a permanent logo.

#### 2.04 FABRICATION

- A. Assemblies shall be furnished [knocked down for field assembly and will be glazed in the field] [assembled (should configurations and job site conditions allow)][unitized (should configurations and job site conditions allow)].
- B. Door assemblies shall be factory prepared for field mounting of hardware.

C. Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions within required tolerance. Obtain approved shop drawings prior to fabrication.

# 2.05 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designing finishes.
- B. Covers shall be chemically cleaned and pretreated; then, finished with:
  - 1. High Performance Coraflon Fluoropolymer Finish by PPG®. Solid color to be selected from SAFTI's Standard Color Chart. Mica, XL, Gloss & Exotics are available at an additional charge.
- C. Protect finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
- D. Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

# 2.06 DOOR HARDWARE FOR SINGLE AND PAIRED DOORS

- A. Hardware shall be supplied with the fire door. Hardware selection shall be from door manufacturer's standard recommended hardware groups as specified below. Please call manufacturer for custom hardware.
- B. Standard operating hardware for single and pair doors.

Quantity	Item	Description	Manufacturer	Finish
1	Hinges	Heavy-duty Continuous Geared OKC	Pemko	Anodized
1	Panic Device	Modern Touchbar with Surface Vertical Rods	Von Duprin 9827F w/ 996 L-trim	US26D
1	<b>Closing Device</b>	Heavy-duty Surface Applied Closer	LCN 4040xp	Aluminum
1	Auto Door Bottoms	420APKL	Pemko	

#### **PART 3 EXECUTION**

# 3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data including product technical bulletins and installation instructions.

#### 3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, have been previously installed under other sections, and are acceptable for product installation in accordance with manufacturer's instructions. Openings shall be plumb, square and within allowable tolerances. The Architect/Engineer shall be notified of any conditions that jeopardize the integrity of the proposed fire wall/door framing system. Do not proceed until such conditions are corrected.

# 3.03 INSTALLATION

A. Fire wall/door installation shall be by a licensed contractor and in strict accordance with the approved shop drawings.

# 3.04 CLEANING AND PROTECTION

- A. Protect glass from contact with contaminating substances resulting from construction operations. Remove such substances by method approved by manufacturer.
- B. Wash glass on both faces not more than four days prior to date schedule for inspections intended to establish date of Substantial Completion. Wash glass by method recommended by glass manufacturer.
- C. Remove temporary coverings and protection of adjacent work areas.
- D. Remove construction debris from project site and legally dispose of debris.

#### SECTION 08 4313 - ALUMINUM-FRAMED STOREFRONTS

# PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. Weatherstripping.
- D. Door hardware.

# 1.02 RELATED REQUIREMENTS

- A. Section 04 2000 Unit Masonry
- B. Section 07 9200 Joint Sealants: Sealing joints between frames and adjacent construction.
- C. Section 08 4413 Glazed Aluminum Curtain Walls.
- D. Section 08 7100 Door Hardware: Hardware items other than specified in this section.
- E. Section 08 8000 Glazing: Glass and glazing accessories.

# 1.03 REFERENCE STANDARDS

- A. AAMA CW-10 Care and Handling of Architectural Aluminum From Shop to Site; 2015.
- B. AAMA 501.2 Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 2009.
- C. AAMA 503 Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems; 2014.
- D. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum; 2012.
- E. AAMA 612 Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2015.
- F. AAMA 1503 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

- G. AAMA 2604 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- H. ASCE 7 Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- I. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- J. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- K. ASTM B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- L. ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- M. ASTM E330/E330M Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- N. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- O. ASTM E547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2000 (Reapproved 2016).
- P. ASTM E1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.

## 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

#### 1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Submit two samples 12 x 12 inches (\_\_\_x\_\_ mm) in size illustrating finished aluminum surface, glass, infill panels, glazing materials.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- F. Mock Up: Include a portion of the storefront system in the project mock up.
- G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

## 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- B. Comply with Zone 2, Ashrae Standard 90.1 (2013) Table 5.5.3 U Factor .60 Maximum, SHGC .25 Minimum
- C. Rating of Fenestration Products
  - 1. The U-factor, SHGC, and air leakage rate for all manufactured fenestration products shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council.
- D. Labeling of Fenestration Products
  - 1. All manufactured fenestration products shall have a permanent nameplate, installed by the manufacturer, listing the U-factor, SHGC, and air leakage rate.

## 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

#### 1.08 WARRANTY

- A. See Section 01 7800 Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Final Acceptance.
- C. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

## PART 2 PRODUCTS

#### 2.01 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

#### 2.02

- A. Center-Set Style, Thermally-Broken:
  - 1. Basis of Design: Kawneer Trifab VersaGlaze 451T Framing System or Approved Equal.
  - 2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep (51 mm wide by 114 mm deep).
  - 3. At exterior applications provide thermally broken ultra sill flashing euqal to Kawneer Trifab VersaGlaze 451 UT with integral weeps and with sealed end metal dams by manufacturer.
- B. Center-Set Style, Not Thermally-Broken:
  - 1. Basis of Design: Kawneer Trifab VersaGlaze 450 Framing System or Approved Equal.
  - 2. Vertical Mullion Dimensions: 1-3/4 inches wide by 4-1/2 inches deep (45 mm wide by 114 mm deep).
- C. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
- D. Substitutions: See Section 01 6000 Product Requirements.
  - 1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

## 2.03 BASIS OF DESIGN -- SWINGING DOORS

A. Wide Stile, Non-Insulated Glazing: Non-Thermally-Broken (Interior):

- 1. Basis of Design: Kawneer 350 Standard Entrance or Approved Equal.
- 2. Thickness: 1-3/4 inches (43 mm)
- 3. Bottom Rail: 10 inches.
- B. Wide Stile, Insulating Glazing, Thermally-Broken (Exterior):
  - 1. Basis of Design: Kawneer 350 Standard Entrance or Approved Equal.
  - 2. Thickness: 2-1/4 inch (57.1 mm).
  - 3. Bottom Rail: 10 inches.

### 2.04 APPLICATION SCHEDULE

A. Provide thermally broken systems at all exterior applications.

#### 2.05 STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
  - 1. Finish: AAMA 2605; Flouropolymer Coating.
    - a. Factory finish all surfaces that will be exposed in completed assemblies.
    - b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
    - c. Refer to Section 08 4413 Glazed Aluminum Curtain Walls / Match Finish
  - 2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
  - 3. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
  - 4. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
  - 5. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F (95 degrees C) over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

- 6. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
- 7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

# B. Performance Requirements:

- 1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
  - a. Design Wind Loads: Comply with requirements of ASCE 7.
  - b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
- 2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf (390 Pa).
- 3. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft (0.3 L/sec sq m) of wall area, when tested in accordance with ASTM E283 at 6.27 psf (300 Pa) pressure differential across assembly.
- 4. Overall U-value Including Glazing for Thermally Broken Application: 0.46 Btu/(hr sq ft deg F) (\_\_\_\_\_ Btu/(hr sq ft deg F)), maximum.

#### 2.06 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sectionsthermally broken and non-thermally broken where indicated, drainage holes and internal weep drainage system.
  - 1. Glazing Stops: Flush.
- B. Glazing: As specified in Section 08 8000.
- C. Swing Doors: Glazed Aluminum as specified above. .

#### 2.07 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Fasteners: Stainless steel.

C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

## 2.08 ACCESSORIES

A. Provide manufacturers interior stool trim as shown on drawings.

### 2.09 FINISHES

- A. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.
- B. Color: To be selected by Owner and Architect from manufacturer's full range.
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

## 2.10 HARDWARE

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: As specified in Section 08 7100.
- C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

#### 3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.

- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Set thresholds in full bed of sealant and secure.
- J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

## 3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm per m) non-cumulative or 0.06 inch per 10 feet (1.5 mm per 3 m), whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

## 3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 Quality Requirements, for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- B. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
  - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
  - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
- C. Provide field testing of installed storefront system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.

- 1. Perform a minimum of two tests in each designated area as indicated on drawings.
- 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
- 3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 4.18 psf (200 Pa).
  - a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce (14 gram) that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.
- D. Repair or replace storefront components that have failed designated field testing, and retest to verify performance conforms to specified requirements.
- E. Test installed storefront for water penetration in accordance with ASTM E1105 with a uniform test pressure difference of 2.86 lbf/sq ft (140 Pa). Test shall include a minimum of 4 cycles, each lasting a minimum of 5 minutes.

## 3.05 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

## 3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

## 3.07 PROTECTION

A. Protect installed products from damage until Date of Final Acceptance.

## **END OF SECTION 08 4313**

This page intentionally left blank

#### SECTION 08 4413 - GLAZED ALUMINUM CURTAIN WALLS

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter seating of curtain wall framing.
  - 1. Basis of Design: 1600 Wall System 1 Curtain Wall Blast Mitigation 2-1/2" sightline, outside glazed pressure plate format.
    - a. System depth: 7-1/2" for 1" insulating glazing.

# 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 Cast-in-Place Concrete: Weld plates embedded in concrete for attachment of anchors.
- B. Section 04 2000 Unit Masonry
- C. Section 05 1200 Structural Steel Framing: Steel attachment members.
- D. Section 05 5000 Metal Fabrications: Steel attachment devices.
- E. Section 07 2500 Weather Barriers: Sealing framing to weather barrier installed on adjacent construction.
- F. Section 07 9005 Joint Sealers: Perimeter sealant and back-up materials.
- G. Section 08 4313 Aluminum-Framed Storefronts:
- H. Section 08 4113 Aluminum-Framed Entrances
- I. Section 08 8000 Glazing.
- J. Section 09 2116 Gypsum Board Assemblies

#### 1.03 REFERENCE STANDARDS

- A. AAMA CW-10 Care and Handling of Architectural Aluminum From Shop to Site; 2015.
- B. AAMA 501.1 Standard Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration Using Dynamic Pressure; 2005.
- C. AAMA 501.2 Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 2009.

- D. AAMA 1503 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- E. AAMA 2603 Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2015.
- F. AAMA 2604 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- G. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- H. ASCE 7 Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- I. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2014.
- J. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- K. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- L. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- M. ASTM B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- N. ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- O. ASTM E330/E330M Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- P. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

- Q. ASTM E547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2000 (Reapproved 2016).
- R. ASTM E1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.
- S. SSPC-Paint 20 Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- T. Unified Facilities Criteria (UFC):
  - 1. UFC 1-200-01: General Building Requirements.
  - 2. UFC 3-310-01: Design: Structural Load Data.
  - 3. UFC 4-010-01: DoD Minimum Antiterrorism Standards for Buildings.
- U. Protective Design Center Technical Report (PDC-TR) 19 April 2012.

### 1.04 SUBMITTALS

- A. See Section 01 3001 Submittals
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, \_\_\_\_\_, and infill.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Submit two samples at a minimum of 12 by 12 inches (304.8 by 304.8 mm) in size illustrating finished aluminum surface, glazing, infill panels, and glazing materials.
- E. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
- F. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.
- G. Structural Glazing Adhesive: Submit product data and calculations showing compliance with performance requirements.

- H. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- I. Field Quality Control Submittals: Report of field testing for water leakage.
- J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

# 1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.

## **1.06 MOCK-UP**

- A. See Section 01 4000 Quality Requirements, for general requirements for mock-ups.
- B. Provide mock-up of one curtain wall unit including all Components, sealants, flashings, glazing, attachments, and anchorage.
- C. Locate on-site where directed by Architect. Mock-up may remain as part of the Work.

## 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

## 1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degreesC). Maintain this minimum temperature during and 48 hours after installation.

## 1.09 WARRANTY

- A. See Section 01 7800 Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a 10 year period after Date of Final Completion.
- C. Provide 20 year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

#### PART 2 PRODUCTS

## 2.01 MANUFACTURERS

- A. Basis of Design: See below under description of products.
- B. Kawneer; Product 1600 Wall System I Blast Resistant Assembly.
- C. Glazed Aluminum Curtain Walls:
  - 1. YKK AP America Inc: www.ykkap.com.
  - 2. Oldcastle BuildingEnvelope: www.oldcastlebe.com.

## 2.02 CURTAIN WALL

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
  - 1. Outside glazed, with pressure plate (fiberglass if necessary to achieve overall thermal performce specified) and mullion cover.
  - 2. Vertical Mullion Face Width: 2-1/2 inches (63.5 mm).
  - 3. Vertical Mullion Depth From Face to Back: As required to meet blast resistance requirements. Drawings indicate 7-1/2" depth. Advise architect's office for coordination if required mullion depth exceed 7-1/2 inches.
  - 4. Finish: High performance organic coating
    - a. Factory finish surfaces that will be exposed in completed assemblies.
    - b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
    - c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
  - Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
  - 6. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
  - 7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and

migrating moisture occurring within system.

- 8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
- B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
  - 1. Design Wind Loads: Comply with the requirements of IBC 2015 code.
    - a. Measure performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
    - b. Member Deflection: For spans less than 13 feet 6 inches (4115 mm), limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch (19 mm), whichever is less and with full recovery of glazing materials.
    - c. Member Deflection: For spans over 13 feet 6 inches (4115 mm) and less than 40 feet (12.2 m), limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch (1/240 of span plus 6.4 mm), with full recovery of glazing materials.
  - 2. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with requirements of ASCE 7.
  - 3. Movement: Accommodate the following movement without damage to components or deterioration of seals:
    - a. Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.
    - b. Expansion and contraction caused by cycling temperature range of 170 degrees F (77 degrees C) over a 12 hour period.
    - c. Movement of curtain wall relative to perimeter framing.
    - d. Deflection of structural support framing, under permanent and dynamic loads.
- C. Water Penetration Resistance: No uncontrolled water on indoor face when tested as follows:
  - 1. Test Pressure Differential: 10 psf (480 Pa).
  - 2. Test Method: ASTM E331.

- D. Air Leakage: Maximum of 0.06 cu ft/min/sq ft (0.3 L/s/sq m) of wall area, when tested in accordance with ASTM E283 at 6.27 psf (300 Pa) pressure differential across assembly.
  - 1. Air leakage for fenestration and doors shall be determined in accordance with NFRCX 400. Air leakage shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer.

## E. Thermal Performance Requirements:

- 1. Overall U-value Including Glazing: 50 Btu/(hr sq ft deg F) ( W/(sq m K)), maximum.
- U-value shall be determined in accordance with NFRC 100. U-Factors shall be
  determined by a laboratory accredited by a nationally recognized accreditation
  organization, such as the National Fenestration Rating Council, and shall be
  labeled and certified by the manufacturer.
- 3. Overall Solar Heat Gain Coefficient Including Glazing: .25
- F. Labeling of Fenestration: The U-factor, SHGC, and air leakage rate for all manufactured doors and fenestration shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council. All products shall have a permanent name-plate, installed by the manufacturer, listing the U-factor, SHGC, Visible Transmittance and air leakage rate.

## G. Blast Mitigation Performance:

- 1. Blast Mitigation: Provide system designed to meet or exceed the following requirements of the UFC 4-010-01 (Latest Edition), "DoD Minimum Antiterrorism Standard for Buildings."
  - a. Section B-3.1 Standard 10: Windows and Skylights
  - b. Section B-3.1.1 Dynamic Analysis
  - c. c. Section B-3.1.2 Testing
  - d. Section B-3.1.3 ASTM F 2248 design Approach for Laminated Glass Glazing Systems.
  - e. Section B-3.1.3.1 Glazing
  - f. Section B-3.1.3.2 Frames

- g. Section B-3.1.3.3 Glazing Frame Bite
- h. Section B-3.1.3.4 Connection Design
- i. Section B-3.1.4 Static Design of Supporting Elements
- j. Section B-3.1.4.2 Reactions
- H. Windborne-Debris-Impact Resistance Performance: Shall be tested in accordance with ASTM E 1886, information in ASTM E1996 and TAS 201/203.
  - 1. Large-Missile Impact: For aluminum-framed systems located within 30 feet (9.1m) of grade.
  - 2. Small-Missile Impact: For aluminum-framed systems located above 30 feet (9.1m) of grade

## 2.03 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
  - 1. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
- B. Glazing: As specified in Section 08 8000.

#### 2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
  - 1. Thickness shall not be less than 0.070 inches (1.78 mm)
- B. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- C. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.
- D. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.
- E. Exposed Flashings: 0.040 inch (\_\_\_\_ mm) thick aluminum sheet; finish to match framing members. Provide separation material between all adjacent dissimilar metals.
- F. Concealed Flashings: 0.018 inch (0.5 mm) thick galvanized steel and aluminum.

- G. Perimeter Sealant: Type II specified in Section 07 9005.
- H. Glazing: As specified in Section 08 8000.
- I. Glazing Accessories: As specified in Section 08 8000.
- J. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

## 2.05 FINISHES

- A. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.
- B. Color: Custom Color to be selected by Architect.
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

#### PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other related work.
- B. Verify that curtain wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

#### 3.02 INSTALLATION

- A. Install curtain wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Coordinate attachment and seal of perimeter air and vapor barrier materials.

- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Structural Sealant Glazing (SSG) Adhesive: Install structural sealant glazing adhesive and weatherseal sealant in accordance with manufacturer's instructions.
- J. Install perimeter sealant in accordance with Section 07 9005.
- K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

## 3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft (1.5 mm/m) non-cumulative or 0.5 inches per 100 ft (12 mm/30 m), whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).
- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch (19 mm) and minimum of 1/4 inch (6 mm).

# 3.04 FIELD QUALITY CONTROL

- A. Provide services of manufacturer's field representative to observe installation and submit report.
- B. Test installed curtain wall for water leakage in accordance with AAMA 501.2.
- C. Replace curtain wall components that have failed field testing and retest until performance is satisfactory.

### 3.05 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Remove excess sealant by method acceptable to sealant manufacturer.

## 3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

# **END OF SECTION 08 4413**

#### **SECTION 08 7100 - DOOR HARDWARE**

# 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 this Section.

## 1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
  - 1. Swinging doors.
  - 2. Sliding doors.
  - 3. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
  - 1. Mechanical door hardware.
  - 2. Electromechanical door hardware.
  - 3. Cylinders specified for doors in other sections.

## C. Related Sections:

- 1. Division 08 Section "Hollow Metal Doors and Frames".
- 2. Division 08 Section "Flush Wood Doors".
- 3. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
  - 1. ANSI A117.1 Accessible and Usable Buildings and Facilities.
  - 2. ICC/IBC International Building Code.
  - 3. NFPA 70 National Electrical Code.
  - 4. NFPA 80 Fire Doors and Windows.
  - 5. NFPA 101 Life Safety Code.
  - 6. NFPA 105 Installation of Smoke Door Assemblies.
  - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

- 1. ANSI/BHMA Certified Product Standards A156 Series.
- 2. UL10C Positive Pressure Fire Tests of Door Assemblies.
- 3. ANSI/UL 294 Access Control System Units.
- 4. UL 305 Panic Hardware.
- 5. ANSI/UL 437- Key Locks.

## 1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  - 3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
    - h. Warranty information for each product.
  - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Shop Drawings: Details of electrified access control hardware indicating the following:

- 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
  - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
  - b. Complete (risers, point-to-point) access control system block wiring diagrams.
  - c. Wiring instructions for each electronic component scheduled herein.
- 2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

## E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.
- B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Division 01, Project Record Documents.

## 1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
  - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
  - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
  - 1. Function of building, purpose of each area and degree of security required.
  - 2. Plans for existing and future key system expansion.
  - 3. Requirements for key control storage and software.
  - 4. Installation of permanent keys, cylinder cores and software.
  - 5. Address and requirements for delivery of keys.
- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
  - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and

- adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
- 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
- 3. Review sequence of operation narratives for each unique access controlled opening.
- 4. Review and finalize construction schedule and verify availability of materials.
- 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

#### 1.7 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

#### 1.8 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
  - 1. Structural failures including excessive deflection, cracking, or breakage.
  - 2. Faulty operation of the hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

#### **PART 2 - PRODUCTS**

## 2.1 BUTT HINGES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
  - 1. Quantity: Provide the following hinge quantity:
    - a. Two Hinges: For doors with heights up to 60 inches.
    - b. Three Hinges: For doors with heights 61 to 90 inches.
    - c. Four Hinges: For doors with heights 91 to 120 inches.
    - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
  - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
    - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
    - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
  - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

- a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
- b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
- 4. Hinge Options: Comply with the following:
  - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.

#### 5. Manufacturers:

a. McKinney (MK) - TA/T4A Series, 5-knuckle.

#### 2.2 CONTINUOUS HINGES

- A. Pin and Barrel Continuous Hinges: ANSI/BHMA A156.26 Grade 1-600 pin and barrel continuous hinges with minimum 14 gauge Type 304 stainless steel hinge leaves, concealed stainless pin, and twin self-lubricated nylon bearings at each knuckle separation. Factory trim hinges to suit door height and prepare for electrical cut-outs.
  - 1. Manufacturers:
    - a. Markar Products; ASSA ABLOY Architectural Door Accessories (MR).

## 2.3 POWER TRANSFER DEVICES

A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex<sup>TM</sup> standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

## 1. Manufacturers:

- a. Pemko (PE) EL-CEPT Series.
- b. Securitron (SU) EL-CEPT Series.
- B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate

electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

- 1. Provide one each of the following tools as part of the base bid contract:
  - a. McKinney (MK) Electrical Connecting Kit: QC-R001.
  - b. McKinney (MK) Connector Hand Tool: QC-R003.
- 2. Manufacturers:
  - a. McKinney (MK) QC-C Series.

## 2.4 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.
  - 1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
  - 2. Furnish dust proof strikes for bottom bolts.
  - 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
  - 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
  - 5. Manufacturers:
    - a. Rockwood (RO).
- B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
  - 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
  - 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
  - 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
  - 4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.

- 5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
- 6. Manufacturers:
  - a. Rockwood (RO).

## 2.5 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
  - 1. Threaded mortise cylinders with rings and cams to suit hardware application.
  - 2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  - 3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
  - 4. Tubular deadlocks and other auxiliary locks.
  - 5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
  - 6. Keyway: Match Facility Standard.
- C. Keying System: Each type of lock and cylinders to be factory keyed.
  - 1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
  - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
  - 3. Existing System: Field verify and key cylinders to match Owner's existing system.
- D. Key Quantity: Provide the following minimum number of keys:
  - 1. Change Keys per Cylinder: Two (2)
  - 2. Master Keys (per Master Key Level/Group): Five (5).
  - 3. Construction Keys (where required): Ten (10).
- E. Construction Keying: Provide construction master keyed cylinders.
- F. Key Registration List (Bitting List):

- 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
- 2. Provide transcript list in writing or electronic file as directed by the Owner.

## 2.6 KEY CONTROL

A. Key Control Cabinet: 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 have expansion capacity of 150% of the number of locks required for the project.

#### 1. Manufacturers:

- a. Lund Equipment (LU).
- b. MMF Industries (MM).
- c. Telkee (TK).

## 2.7 MORTISE LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.

## 1. Manufacturers:

- a. Corbin Russwin Hardware (RU) ML2000 Series.
- b. Sargent Manufacturing (SA) 8200 Series.

## 2.8 STAND ALONE ACCESS CONTROL LOCKING DEVICES

- A. Stand Alone Electronic Keypad Locksets: Internal, battery-powered, self-contained ANSI Grade 1 mortise or cylindrical lock consisting of electronically motor driven locking mechanism and integrated keypad without requirements for separate electronic programming devices. Locks to accept standard, interchangeable (removable) core, security and high security override cylinders. Provide keypad locks with a minimum 100 user codes furnished standard with 6 "AA" batteries and non-volatile memory.
  - 1. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
  - 2. Manufacturers:
    - a. Sargent Manufacturing (SA) KP Series.

## 2.9 DEADLOCKS AND LATCHES

A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.36, Grade 1, small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.

#### 1. Manufacturers:

a. Sargent Manufacturing (SA) - 4870 Series.

## 2.10 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
  - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
  - 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
  - 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
  - 2. Strikes for Bored Locks and Latches: BHMA A156.2.
  - 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
  - 4. Dustproof Strikes: BHMA A156.16.

## 2.11 ELECTRIC STRIKES

- A. Surface Mounted Rim Electric Strikes: Surface mounted rim exit device electric strikes conforming to ANSI/BHMA A156.31, Grade 1, and UL Listed for both Burglary Resistance and for use on fire rated door assemblies. Construction includes internally mounted solenoid with two heavy-duty, stainless steel locking mechanisms operating independently to provide tamper resistance. Strikes tested for a minimum of 500,000 operating cycles. Provide strikes with 12 or 24 VDC capability supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike. Strike requires no cutting to the jamb prior to installation.
  - 1. Manufacturers:

- a. HES (HS) 9400/9500/9600/9700/9800 Series.
- B. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

## 2.12 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
  - 1. Exit devices shall have a five-year warranty.
  - 2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
  - 3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
  - 4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
  - 5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
  - 6. Flush End Caps: Provide flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
  - 7. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
    - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
  - 8. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
  - 9. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
  - 10. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
  - 11. Rail Sizing: Provide exit device rails factory sized for proper door width application.

- 12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.
  - 1. Electromechanical exit devices shall have the following functions and features:
    - a. Universal Molex plug-in connectors that have standardized color-coded wiring and are field configurable in fail safe or fail secure and operate from 12vdc to 24vdc regulated.
    - b. EcoFlex or equivalent technology that reduces energy consumption up to 92% as certified by GreenCircle.
    - c. Options to be available for request-to-exit or enter signaling, latchbolt and touchbar monitoring.
    - d. Field configurable electrified trim to fail-safe or fail-secure that operates from 12-24VDC.
    - e. Five-year limited warranty for electromechanical features.

#### 2. Manufacturers:

- a. Corbin Russwin Hardware (RU) ED4000 / ED5000 Series.
- b. Sargent Manufacturing (SA) 80 Series.

#### 2.13 SURFACE DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
  - 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
  - 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
  - 3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
  - 4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
  - 5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
  - 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper

installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

- B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
  - 1. Large body cast iron surface mounted door closers shall have a 30-year warranty.
  - 2. Manufacturers:
    - a. Corbin Russwin Hardware (RU) DC8000 Series.
    - b. Norton Rixson (NO) 9500 Series.
    - c. Sargent Manufacturing (SA) 281 Series.

## 2.14 ARCHITECTURAL TRIM

#### A. Door Protective Trim

- 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
- 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
- 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
- 4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:
  - a. Stainless Steel: 300 grade, 050-inch thick.
- 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
- 6. Manufacturers:
  - a. Rockwood (RO).

#### 2.15 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
  - 1. Manufacturers:
    - a. Rockwood (RO).

## 2.16 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
  - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
  - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
  - 1. Pemko (PE).

#### 2.17 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

## 1. Manufacturers:

- a. Sargent Manufacturing (SA) 3280 Series.
- b. Securitron (SU) DPS Series.
- B. Switching Power Supplies: Provide power supplies with either single or dual voltage configurations at 12 or 24VDC. Power supplies shall have battery backup function with an integrated battery charging circuit and shall provide capability for power distribution, direct lock control and Fire Alarm Interface (FAI) through add on modules. Power supplies shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs.
  - 1. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
  - 2. Manufacturers:
    - a. Securitron (SU) AQD Series.
- C. Intelligent Switching Power Supplies: Provide power supplies with single, dual or multi-voltage configurations at 12 and/or 24VDC. Power Supply shall have battery backup function with an integrated battery charging circuit. The power supply shall have a standard, integrated Fire Alarm Interface (FAI). The power supply shall provide capability for secondary voltage, power distribution, direct lock control and network monitoring through add on modules. The power supply shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs. Network modules shall provide remote monitoring functions such as status reporting, fault reporting and information logging.
  - 1. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
  - 2. Manufacturers:
    - a. Securitron (SU) AQL Series.

#### 2.18 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

## 2.19 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

## **PART 3 - EXECUTION**

#### 3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

#### 3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

# 3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

- 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
  - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
  - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
- E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

# 3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
  - 1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

#### 3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

## 3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

# 3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

## 3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
  - 1. Quantities listed are for each pair of doors, or for each single door.
  - 2. The supplier is responsible for handing and sizing all products.
  - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
  - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Manufacturer's Abbreviations:

- 1. MK McKinney
- 2. MR Markar
- 3. SA SARGENT
- 4. RO Rockwood
- 5. BE BEST Locks & Closers
- 6. HS HES
- 7. RF Rixson
- 8. PE Pemko
- 9. OT Other
- 10. SU Securitron

# **Hardware Sets**

# **Set: 1.0**

Doors: 150, 152, 245, 247, 250 Description: EXT PANIC - HM

3 Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1 Rim Exit Device, Storeroom	70 8804 ETP	US32D	SA
1 Best Core	As required - match existing	626	BE
1 Door Closer	281 CPS	EN	SA
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Gasketing	303AS		PE
1 Rain Guard	346C x LAR		PE
1 Sweep	3452AV		PE
1 Threshold	271A MSES25SS		PE

# **Set: 2.0**

Doors: 101A, 101B

Description: EXT SGL BULLET RESISTANT

1 Continuous Hinge	FM300 EL-CEPTx32D	630	MR
1 Rim Exit Device, Storeroom	55 56 70 8804 Less Pull	US32D	SA
1 Best Core	As required - match existing	626	BE
1 Door Pull	BF168	US32D	RO
1 Door Closer	281 CPS	EN	SA

Huntsville Readiness Center
Huntsville, AL

1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Gasketing	303AS		PE
1 Rain Guard	346C x LAR		PE
1 Sweep	315CN		PE
1 Threshold (Heavy Duty)	2715AK MSES25SS		PE
1 ElectroLynx Harness	QC-Cxxx		MK
1 ElectroLynx Harness	QC-C1500P		MK
1 Card Reader	by security		
1 Position Switch	DPS-M/W-WH (as required)		SU
1 Power Supply	AQL Series as Required		SU

Notes: Door is normally closed and locked.

When presented with valid credentials, reader unlocks door.

During power failure or fire alarm, door remains locked (fail secure).

REX switch within lock allows free egress at all times.

# **Set: 3.0**

Doors: 215, 224

Description: EXT - EGRESS - HM - EAC

3 Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1 Rim Exit Device, Classroom	70 8813 ETP	US32D	SA
1 Best Core	As required - match existing	626	BE
1 Electric Strike (Future - Prep only)	9600/9700-LBM X 2005m3	630	HS
1 Door Closer	281 CPS	EN	SA
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Gasketing	303AS		PE
1 Rain Guard	346C x LAR		PE
1 Sweep	3452AV		PE
1 Threshold	271A MSES25SS		PE
1 Card Reader	by security		
1 Position Switch	DPS-M/W-WH (as required)		SU
1 Power Supply	AQL Series as Required		SU

Notes: Future access control - Prep door / frame as required, for future access control. Wiring and cabling shall be provided per electrical drawings. Electric strike shall be used manually [without power] until access controls are added in the future. When fully functioning [with power], electric strike is operated by activating the card reader which releases the strike. The

strike re-latches after a pre-determined time. Hardware is fail secure

# **Set: 4.0**

Doors: 133, 135, 136, 161

Description: EXT HM EGRESS PAIR

6 Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
2 Mullion	L980S	PC	SA
1 Rim Exit Device, Storeroom	70 8804 ETP	US32D	SA
1 Rim Exit Device, Exit Only	8810 EO	US32D	SA
1 Cylinder	70 980C1	US26D	SA
2 Best Core	As required - match existing	626	BE
2 Door Closer	281 CPS	EN	SA
2 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Astragal	S772D (mtg on mullion)		PE
1 Gasketing	303AS		PE
1 Rain Guard	346C x LAR		PE
2 Sweep	315CN		PE
1 Threshold	271A MSES25SS		PE

# **Set: 5.0**

**Doors: 159** 

Description: EXT PR ELECTRICAL

6 Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1 Mullion	L980S	PC	SA
1 Rim Exit Device, Classroom	70 8813 ETP	US32D	SA
1 Rim Exit Device, Exit Only	8810 EO	US32D	SA
1 Cylinder	70 980C1	US26D	SA
2 Best Core	As required - match existing	626	BE
2 Door Closer	281 CPS	EN	SA
2 Astragal	S772D (mtg on mullion)		PE
1 Gasketing	303AS		PE
1 Rain Guard	346C x LAR		PE
2 Sweep	315CN		PE
1 Threshold	271A MSES25SS		PE

# **Set: 6.0**

Doors: 134, 137, 138, 158, 160 Description: EXT PR MEP

6 Hinge, Full Mortise	TA2314 NRP 4-1/2" x 4-1/2"	US32D	MK
2 Surface Bolt	988	Zinc	SA
1 Dormitory/Exit Lock	70 8225 LNP	US26D	SA
1 Best Core	As required - match existing	626	BE
2 Door Closer	281 CPS	EN	SA
1 Astragal	357SP X S88D		PE
1 Gasketing	S88D		PE
1 Rain Guard	346C x LAR		PE
2 Sweep	3452AV		PE
1 Threshold (Heavy Duty)	2715AK MSES25SS		PE

# **Set: 7.0**

Doors: 153

Description: EXT PR KITCHEN

6 Hinge, Full Mortise	TA2314 NRP 4-1/2" x 4-1/2"	US32D	MK
2 Surface Bolt	988	Zinc	SA
1 Dormitory/Exit Lock	70 8225 LNP	US26D	SA
1 Best Core	As required - match existing	626	BE
2 Surface Closer	281 CPSH	EN	SA
2 Armor Plate	K1050 36" X 2" LDW 4BE CSK	US32D	RO
1 Astragal	357SP X S88D		PE
1 Gasketing	S88D		PE
1 Rain Guard	346C x LAR		PE
2 Sweep	3452AV		PE
1 Threshold (Heavy Duty)	2715AK MSES25SS		PE

# **Set: 8.0**

Doors: 202, 204

Description: EXT SGL - MEP

3 Hinge, Full Mortise TA2314 NRP 4-1/2" x 4-1/2" US32D MK

70 8225 LNP	US26D	SA
As required - match existing	626	BE
281 CPS	EN	SA
K1050 36" X 2" LDW 4BE CSK	US32D	RO
S88D		PE
346C x LAR		PE
3452AV		PE
2715AK MSES25SS		PE
	As required - match existing 281 CPS K1050 36" X 2" LDW 4BE CSK S88D 346C x LAR 3452AV	As required - match existing 626 281 CPS EN K1050 36" X 2" LDW 4BE CSK US32D S88D 346C x LAR 3452AV

SS&L# 21112

Notes:

# **Set: 9.0**

Doors: 109, 114, 156, 163, 189, 194, 218, 220, 223, 234

Description: SGL - RATED MEP

Huntsville Readiness Center

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom/Closet Lock	70 8204 LNP	US26D	SA
1 Door Closer	281 Reg / PA	EN	SA
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE

**Set: 10.0** 

Doors: 236, 244

Description: SGL - PASSAGE - RATED

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Passage Latch	8215 LNP	US26D	SA
1 Door Closer	281 Reg / PA	EN	SA
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE

**Set: 11.0** 

Doors: 219, 221

November 1, 2024

Description: SGL - RESTROOM

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Pull Plate	BF 110 x 70C	US32D	RO
1 Door Pull	BF168	US32D	RO
1 Door Closer	281 Reg / PA	EN	SA
1 Mop Plate	K1050 4" X 1" LDW 4BE CSK	US32D	RO
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE

# Set: 12.0

Doors: 242

Description: SGL - TOILET

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Privacy Lock	49 8265 LNP	US26D	SA
1 Door Closer	281 Reg / PA	EN	SA
1 Mop Plate	K1050 4" X 1" LDW 4BE CSK	US32D	RO
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE

# **Set: 13.0**

Doors: 146, 205, 206, 237, 238

Description: PR - STOR [GASKETED]

6 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
2 Flush Bolt	555 [12" / 72" AFF ]	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom/Closet Lock	70 8204 LNP	US26D	SA
2 Door Closer	281 Reg / PA	EN	SA
2 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
2 Door Stop	409 / 446 as required	US26D	RO
1 Astragal	357SP X S88D		PE
1 Gasketing	S88D		PE
2 Door Bottom	STC411APK36		PE

# **Set: 14.0**

Doors: 102, 117, 147, 182

Description: ENTRY VEST PAIR

6 Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Mullion	L980S	PC	SA
1 Rim Exit Device, Classroom	70 8813 ETP	US32D	SA
1 Rim Exit Device, Exit Only	8810 EO	US32D	SA
1 Cylinder	70 980C1	US26D	SA
2 Best Core	As required - match existing	626	BE
2 Door Closer	281 CPS	EN	SA
2 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
2 Silencer	608		RO

# **Set: 15.0**

Doors: 118, 168

Description: VEST PAIR

6 Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Mullion	L980S	PC	SA
2 Rim Exit Device, Passage	8815 ETP	US32D	SA
1 Cylinder	70 980C1	US26D	SA
1 Best Core	As required - match existing	626	BE
2 Door Closer	281 CPS	EN	SA
2 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
2 Silencer	608		RO

# Set: 16.0

Doors: 132, 139, 162

Description: VEST PUSH/PULL PR

6 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
2 Door Pull	BF168	US32D	RO
2 Push Plate	70C-RKW	US32D	RO
2 Door Closer	281 Reg / PA	EN	SA
2 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO

Huntsville Readiness Center Huntsville, AL	SS&L# 21112	November	1, 2024
<ul><li>2 Door Stop</li><li>2 Silencer</li></ul>	409 / 446 as required 608	US26D	RO RO
Doors: 115, 184 Description: VEST PR RATED	Set: 17.0		
8 Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Mullion	L980S	PC	SA
2 Rim Exit Device, Passage	12 8815 ETP	US32D	SA
1 Cylinder	70 980C1	US26D	SA
1 Best Core	As required - match existing	626	BE
2 Door Closer	281 Reg / PA	EN	SA
2 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
2 Door Stop	409 / 446 as required	US26D	RO
2 Astragal	S772D (mtg on mullion)		PE
1 Gasketing	S88D		PE
	Set: 18.0		

Doors: 207, 211, 214, 216, 222, 233, 240, 241 Description: SGL - ENTRY - EAC KEYPAD

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Keypad Mortise Lock	70 KP8278 LNP	US26D	SA
1 Best Core	As required - match existing	626	BE
1 Door Closer	281 Reg / PA	EN	SA
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
3 Silencer	608		RO
1 Door position switch	by security		OT

Notes: Valid PIN entered into integrated keypad unlocks door. Mechanical key override available. Keypad lock is battery powered, always fail secure.

**Set: 19.0** 

Doors: 143

Description: SGL ASSEMBLY RATED

4 Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Rim Exit Device, Classroom	12 70 8813 ETP	US32D	SA
1 Best Core	As required - match existing	626	BE
1 Door Closer	281 Reg / PA	EN	SA
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE

**Set: 20.0** 

Doors: 142

Description: SGL RATED LOCKER/KITCHEN

3 Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom/Closet Lock	70 8204 LNP	US26D	SA
1 Best Core	As required - match existing	626	BE
1 Door Closer	281 Reg / PA	EN	SA
1 Armor Plate	K1050 36" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE

Set: 21.0

Doors: 209, 213

Description: SGL - BAY ENTRY

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Office/Entry Lock	70 8205 LNP	US26D	SA
1 Door Closer	281 Reg / PA	EN	SA
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE
1 Sweep	315CN		PE
1 Threshold	271A MSES25SS		PE
3 Silencer	608		RO

**Set: 22.0** 

Doors: 110, 144, 145, 185, 187	
Description: SGL RESTROOM	

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Passage Latch	8215 LNP	US26D	SA
1 Door Closer	281 Reg / PA	EN	SA
1 Mop Plate	K1050 4" X 1" LDW 4BE CSK	US32D	RO
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
3 Silencer	608		RO

# **Set: 23.0**

Doors: 186

Description: SGL LACTATION ROOM

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Privacy Lock	49 8265 LNP	US26D	SA
1 Mop Plate	K1050 4" X 1" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
3 Silencer	608		RO

# Set: 24.0

Doors: 166, 188, 248 Description: PR - STOR

6 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
2 Flush Bolt	555 [12" / 72" AFF ]	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom/Closet Lock	70 8204 LNP	US26D	SA
2 Door Stop	409 / 446 as required	US26D	RO
2 Silencer	608		RO

# Set: 25.0

Doors: 140

Description: PR FITNESS

6 Hinge, Full Mortise TA2714 4-1/2" x 4-1/2" US26D MK

Huntsville Readiness Center Huntsville, AL	SS&L# 21112	November	1, 2024
2 Flush Bolt	555 [12" / 72" AFF ]	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Mortise Deadlock	70 4875	US26D	SA
1 Best Core	As required - match existing	626	BE
2 Pull Plate	BF 110 x 70C	US32D	RO
2 Push Plate	70C-RKW	US32D	RO
2 Door Closer	281 Reg / PA	EN	SA
2 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
2 Door Stop	409 / 446 as required	US26D	RO
2 Silencer	608		RO
	Set: 26.0		
Doors: 141			
Description: PR FITNESS			
6 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
2 Flush Bolt	555 [12" / 72" AFF ]	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Mortise Deadlock	70 4875	US26D	SA
1 Best Core	As required - match existing	626	BE
2 Pull Plate	BF 110 x 70C	US32D	RO
2 Push Plate	70C-RKW	US32D	RO
2 Door Closer	281 Reg / PA	EN	SA
2 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
2 Door Stop	409 / 446 as required	US26D	RO
1 Astragal	18061CNB		PE
1 Gasketing	S88D		PE
	Set: 27.0		
Doors: 148			
Description: PR STOR (OHS)			
6 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK

TA2714 4-1/2" x 4-1/2' 6 Hinge, Full Mortise US26D MK 555 [12" / 72" AFF ] 2 Flush Bolt US26D RO 1 Dust Proof Strike US26D 570 RO 1 Storeroom/Closet Lock 70 8204 LNP US26D SA As required - match existing 1 Best Core 626 BE

Huntsville Readiness Center Huntsville, AL	SS&L# 21112	November	r 1, 2024
<ul><li>2 Surf Overhead Stop</li><li>2 Silencer</li></ul>	10-x36 608	630	RF RO
	<u>Set: 28.0</u>		
Doors: 112, 164, 217 Description: SGL - SERVER ROOM			
Description. SGL - SERVER ROOM	L		
3 Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Keypad Mortise Lock	70 KP8278 LNP	US26D	SA
1 Best Core	As required - match existing	626	BE
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE
1 Threshold	271A MSES25SS		PE
	C-4- 20 0		
Dagger 110 120 121 122 122 124	Set: 29.0	170 171 17	12 172
	125, 126, 127, 128, 129, 130, 154, 157, 08, 212, 225, 226, 227, 228, 229, 230, 23		
Description: SGL - OFFICE			
3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Office/Entry Lock	70 8205 LNP	US26D	SA
1 Door Stop	409 / 446 as required	US26D	RO
3 Silencer	608		RO

Set:	30 (	ì
DCI.	$JU \cdot U$	,

Doors: 103, 105, 107, 116, 131, 155, 165, 167, 169, 183

Description: SGL OFFICE RATED

1 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Office/Entry Lock	70 8205 LNP	US26D	SA
1 Best Core	As required - match existing	626	BE
1 Door Closer	281 Reg / PA	EN	SA
1 Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	409 / 446 as required	US26D	RO
1 Gasketing	S88D		PE

# **Set: 31.0**

Doors: 104, 113, 149, 190, 193 Description: SGL CLASS RATED

TA2714 4-1/2" x 4-1/2"	US26D	MK
70 8237 LNP	US26D	SA
As required - match existing	626	BE
281 Reg / PA	EN	SA
K1050 10" X 2" LDW 4BE CSK	US32D	RO
409 / 446 as required	US26D	RO
S88D		PE
	70 8237 LNP As required - match existing 281 Reg / PA K1050 10" X 2" LDW 4BE CSK 409 / 446 as required	70 8237 LNP       US26D         As required - match existing       626         281 Reg / PA       EN         K1050 10" X 2" LDW 4BE CSK       US32D         409 / 446 as required       US26D

# **Set: 32.0**

Doors: 106, 108, 111, 191, 192 Description: SGL STORAGE

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom/Closet Lock	70 8204 LNP	US26D	SA
1 Best Core	As required - match existing	626	BE
1 Door Stop	409 / 446 as required	US26D	RO
3 Silencer	608		RO

# Set: 33.0

Doors: 151, 195, 196, 201, 203, 246, 249, 251

Description: OH DOOR

1 Hardware Balance of hardware by door mfg

# **END OF SECTION 08 7100**

#### SECTION 08 8000 - GLAZING

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Glass.
- B. Glazing compounds and accessories.

# 1.02 RELATED REQUIREMENTS

- A. Section 07 9005 Joint Sealers: Sealant and back-up material.
- B. Section 08 4313 Aluminum-Framed Storefronts
- C. Section 08 4413 Glazed Aluminum Curtain Walls

#### 1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 Safety Standard for Architectural Glazing Materials; current edition.
- B. ASTM C1036 Standard Specification for Flat Glass; 2011.
- C. ASTM C1048 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- D. ASTM C1172 Standard Specification for Laminated Architectural Flat Glass; 2014.
- E. ASTM E1300 Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.
- F. ASTM E2190 Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.
- G. GANA (GM) GANA Glazing Manual; 2009.
- H. GANA (SM) GANA Sealant Manual; 2008.
- I. GANA (LGRM) Laminated Glazing Reference Manual; 2009.
- J. ICC (IBC) International Building Code; 2015.
- K. IGMA TM-3000 North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2004).
- L. ASTM Standard F1642-04, Standard Test Method for Glazing and Glazing Systems subject to airblast loadings.

M. UFC 4-010-01 DpD Minimum Antiterrorism Standards for Buildings.

## 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- D. Samples: Submit two samples \_\_ by \_\_ inch (\_\_ by \_\_ mm) in size of glass and plastic units, showing coloration and design.

# 1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

## **1.06 MOCK-UP**

A. See section 08 4413 - Glazed Aluminum Curtain Walls.

#### 1.07 WARRANTY

- A. See Section 01 7800 Closeout Submittals, for additional warranty requirements.
- B. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.
- C. Laminated Glass: Provide a ten (10) year warranty to include coverage for delamination, including replacement of failed units.

#### PART 2 PRODUCTS

#### 2.01 INSULATING GLASS UNITS

- A. Type [IG-1] Blast Resistant, Solar Control, Laminated Insulating Glass Units: Vision glass, double glazed.
  - 1. Application: All exterior glazing unless otherwise indicated.

# 2. Performance Requirements:

- a. Blast Mitigation Performance: Shall be tested or proven through analysis to meet ASTM F1642, GAS-TS01, and UFC 04-010-01 performance criteria
  - 1) To meet UFC 04-010-01, B-3.1 Standard 10 for Windows and Skylights, the following options are available:
    - (a) Section B-3.1.1 Dynamic analysis
    - (b) Section B-3.1.2 Testing
    - (c) Section B-3.1.3 ASTM F3348 Design Approach
- b. Winter U-Value: 028
- c. Solar Heat Gain Coefficient: 0.20
- d. VLT (%): 33
- e. Fully tempered.

## 3. Outdoor Lite:

- a. Glass Thickness: (1/4") 6 mm, minimum type as required for blast resistance requirements.
- b. Tint: Equal to Solargray as manufactured by Vitro Architectural Glass
- c. Coating: Equal to Solarban 70XL on Surface #2
- d. Heat-Treatment: Tempered and Heat Strengthened as mandated for safety and by code.
- 4. Interspace Content: Air (1/2") 12.7 mm
- 5. Indoor Lite: Laminate as required for blast resistance requirements.
  - a. Laminate Outboard Lite:
    - 1) Glass Thickness: (1/8") 3 mm +/- as required for blast resistance requirements.
    - 2) Tint: Clear
    - 3) Heat-Treatment: Tempered and Heat Strengthened as mandated for safety and by code.

- b. Interlayer:
  - 1) Type: PVB
  - 2) Thickness: minimum as required for blast resistance requirements.
  - 3) Color: Clear
- c. Laminate Inboard Lite:
  - 1) Glass Thickness: (1/8") 3 mm +/- as required for blast resistance requirements.
  - 2) Tint: Clear
  - 3) Heat-Treatment: Tempered and Heat Strengthened as mandated for safety and by code.
- B. Type IG-2 Non-Blast Resistant, Solar Control, Laminated Insulating Glass Units: Double glazed.
  - 1. Application: Exterior glazing where indicated.
  - 2. Performance Requirements: Same as Type IG-1, excluding blast resistance requirements
  - 3. Glazing Assembly:
    - a. Outdoor Lite:
      - 1) Glass Thickness: 1/4" (6mm) +/- as required for Impact Debris Standards
      - 2) Coating: One of the following
        - (a) Solarban 70 on Surface #2
        - (b) Guardian SNX62/27 on Surface #2
        - (c) Or approved Equal
      - 3) Tint: Equal to Solargray as manufactured by Vito Architectural Glass (or approved equal)
      - 4) Heat Treatment: Tempered and Heat Strengthened as mandated for safety and by code
    - b. Interlayer:

- 1) *Type: PVB*
- 2) Thickness: .060" (1.52mm)
- 3) Color: Clear
- c. *Inboard Lite(s)* 
  - 1) Glass Thickness: 1/4" (6mm) +/- as required for Impact Debris Standards
  - 2) Tint: Clear
  - 3) Tempered and Heat Strengthened as mandated for safety and by code
- C. Type [IG-3] Blast Resistant, Solar Control, Laminated Insulating Glass Units: Spandrel glass, Double glazed.
  - 1. Application: [Exterior glazing where indicated].
  - 2. Performance Requirements: Same as Type IG-1
  - 3. Glazing Assembly: Same as Type IG-1 except as noted below.
    - a. Opacifier: Ceramic frit on #5 surface.
- D. Type [IG-4] Non-Blast Resistant, Solar Control, Laminated Glass Units, Spandrel Glass, Double Glazed
  - 1. Application: Exterior glazing where indicated
  - 2. Performance Requirements: Same as Type IG-1, excluding blast requirements
  - 3. Glazing Assembly: Same as Type IG-1 except as noted below
    - a. Opacifier: Ceramic frit on #5 surface

# 2.02 GLAZING UNITS

- A. Type S-1 Single Vision Glazing:
  - 1. Application: All interior glazing unless otherwise indicated.
  - 2. Type: Fully tempered float glass.
  - 3. Tint: Clear.
  - 4. Thickness: 1/4 inch (6 mm).

- 5. Polish all exposed edges.
- B. Type S-2 Fire-Protection-Rated Glazing:
  - 1. IBC Fire Protection Rating: D-H-T-90, minimum.
  - 2. Application: Provide this type of glazing in the following locations:
    - a. Glazed lites in fire doors.
    - b. Fire windows.
    - c. Sidelights, borrow lites, and other glazed openings in partitions indicated as having an hourly fire rating.
    - d. Other locations indicated on the drawings.
  - 3. Thickness: 1/4 inch (6 mm).
  - 4. Glazing Method: As required for fire rating.

#### 2.03 EXTERIOR GLAZING ASSEMBLIES

- A. Performance Criteria: Select type and thickness of glass to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of glass at design pressures calculated in accordance with the 2015 International Building Code and blast resistance requirements.
  - 1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
  - 2. Glass thicknesses listed are minimum.
- B. Blast Resistance Requirements: Provide glazing system designed to meet or exceed the requirements of the UFC 4-010-01, "DoD Minimum Antiterrorism Standard for Buildings.
- C. Windborne-Debris-Impact Resistance Requirements: Provide glazing system designed to meet or exceed the requirements of ASTM E1886 and information in ASTM E1996

## 2.04 GLASS MATERIALS

- A. Float Glass Manufacturers:
  - 1. AGC Flat Glass North America, Inc: www.na.agc-flatglass.com.

- 2. Guardian Industries Corp: www.sunguardglass.com.
- 3. Pilkington North America Inc: www.pilkington.com/na.
- 4. Substitutions: Refer to Section 01 6000 Product Requirements.
- B. Float Glass: Provide float glass based glazing unless noted otherwise.
  - 1. Annealed Type: ASTM C1036, Type I Transparent Flat, Class 1 Clear, Quality-Q3.
  - 2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.
  - 3. Tinted Types: ASTM C1036, Class 2 Tinted, color and performance characteristics as indicated.
  - 4. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.
- C. Fire-Protection-Rated Glazing: Type, thickness, and configuration as required to achieve indicated ratings.
  - 1. IBC & NFPA Fire Protection Rating: As indicated on drawings.
  - 2. Provide products listed by Underwriters Laboratories or Intertek Warnock Hersey.
  - 3. Labeling: Provide permanent label on each piece giving the IBC rating and other information required by the applicable code.

# 2.05 SEALED INSULATING GLASS UNITS

- A. Manufacturers:
  - 1. Any of the manufacturers specified for float glass.
  - 2. Substitutions: Refer to Section 01 6000 Product Requirements.
- B. Sealed Insulating Glass Units: Types as indicated.
  - 1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
  - 2. Edge Spacers: Aluminum, bent and soldered corners.
  - 3. Edge Seal: Glass to elastomer with supplementary silicone sealant.
  - 4. Purge interpane space with dry hermetic air.

#### 2.06 GLAZING COMPOUNDS

#### A. Manufacturers:

- 1. Bostik Inc: www.bostik-us.com.
- 2. Pecora Corporation: www.pecora.com.
- 3. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
- 4. Substitutions: Refer to Section 01 6000 Product Requirements.

#### 2.07 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
- C. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I.
- D. Glazing Clips: Manufacturer's standard type.

## PART 3 EXECUTION

# 3.01 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

# 3.02 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with manufacturer's instructions.

# 3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

- A. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.
- B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

# 3.04 INSTALLATION - PLASTIC FILM

- A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
- B. Place without air bubbles, creases or visible distortion.
- C. Fit tight to glass perimeter with razor cut edge.

# 3.05 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

## 3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

#### END OF SECTION 08 8000

This page intentionally left blank

#### SECTION 08 8813 - FIRE-RATED GLAZING - 60 MINUTE

## **PART 1 GENERAL**

#### 1.01 SUMMARY

- A. Section Includes: Fire rated glazing
  - 1. SuperLite® II-XL 60 safety rated, fire protective glazing with fire resistive qualities for interior r applications.
- B. Applications of fire rated glazing includes:
  - 1. Fire rated glazing as vision lites in door assemblies.
  - 2. Fire rated glazing as sidelites, transoms in fire rated frames.
- C. Related sections:
  - 1. Section 08 8000: Glazing
  - 2. Section 08 11 13: Hollow Metal Doors and Frames
  - 3. Section 08 8813: Fire-Rated Aluminum Framed Entrances and Storefronts
  - 4. Section 08 8814: Fire Rated Glazing 120 Minute

#### 1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM E119: Methods for Fire Tests of Building Construction and Materials.
  - 2. ASTM E152: Methods for Fire Tests of Door Assemblies.
  - 3. ASTM E163: Methods for Fire Tests of Window Assemblies.
  - 4. ASTM E2074: Standard Test Method for Fire Tests of Door Assemblies, including Positive Pressure Testing of Side-hinged and Pivoted Swinging Door Assemblies.
  - 5. ASTM E2010-1: Standard Test for Positive Pressure of Fire Tests of Window Assemblies.
- B. National fire Protection Association (NFPA):
  - 1. NFPA 80: Fire Doors and Windows.
  - 2. NFPA 251: Fire Tests of Building Construction and Materials.

- 3. NFPA 252: Fire Tests of Door Assemblies.
- 4. NFPA 257: Fire Tests of Window Assemblies.
- C. Underwriters Laboratories, Inc. (UL):
  - 1. UL 9: Standard for Safety of Fire Tests of Window Assemblies.
  - 2. UL 10 B: Standard for Safety of Fire Tests of Door Assemblies.
  - 3. UL 10 C: Standard for Safety of Positive Pressure Tests of Door Assemblies.
  - 4. UL 263: Fire Tests of Building Construction and Materials.
- D. Standard Council of Canada:
  - 1. ULC Standard CAN4-S101: Fire Tests of Building Construction and Materials.
  - 2. ULC Standard CAN4-S104: Fire Tests of Door Assemblies.
  - 3. ULC Standard CAN4-S106: Fire Tests of Window Assemblies.
- E. Consumer Product Safety Commission (CPSC):
  - 1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials.
- F. Glass Association of North America (GANA)
  - 1. GANA Glazing Manual.
  - 2. FGMA Sealant Manual.
- G. National Fenestration Rating Council (NFRC)
  - 1. NFRC 100: Procedure for Determining Fenestration Product U-Factors.
  - 2. NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
- H. [American Recovery and Reinvestment Act
  - 1. Section 1605, Title XVI Buy American Provision]
- I. See section 01 4100 Regulatory Requirments

# 1.03 SYSTEM DESCRIPTION

A. A. Performance Requirements: Provide a fire rated glazing manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects,

damage, or failure.

- 1. Fire Rating: 60 minutes with hose stream.
- Safety rated, fire protective glazing with fire resistive qualities tested in accordance with ASTM E119, NFPA 80, NFPA 251, NFPA 252, NFPA 257, UL 9, UL 10B, UL 10C and UL 263.
- 3. Testing Laboratory: Fire test shall be conducted by a nationally recognized independent testing laboratory.

# B. Listings and Labels:

1. Fire rated glazing shall be under current follow-up services by nationally recognized independent testing laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

## 1.04 SUBMITTALS

- A. . Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedure Section.
  - 1. Shop Drawings: Submit shop drawings showing layouts, profiles and product components.
  - 2. Samples: Submit 12x12 glass samples.
  - 3. Technical Information: Submit latest edition of manufacturer's product data.

# 1.05 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials to specified destinations in manufacturer or distributor's packaging.
- D. Storage and Protection: Store off ground, under cover, protected from weather and construction activities and at temperature conditions recommended by manufacturer.

# 1.06 PROJECT CONDITIONS

A. A. Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings.

Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

## 1.07 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is not intended to limit other rights that the Owner may have under the Contract Documents.
  - 1. Warranty Period: 5-year limited warranty from date of shipping.

## 1.08 REFERENCE STANDARDS

- A. 16 CFR 1201 Safety Standard for Architectural Glazing Materials; current edition.
- B. ASTM C1629/C1629M Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2015.
- C. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials; 2015.
- D. ASTM E695 Standard Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading; 2003, with Editorial Revision (2015).
- E. NFPA 80 Standard for Fire Doors and Other Opening Protectives; 2016.
- F. NFPA 252 Standard Methods of Fire Tests of Door Assemblies; 2012.
- G. NFPA 257 Standard on Fire Test for Window and Glass Block Assemblies; 2017.
- H. NFRC 100 Procedure for Determining Fenestration Product U-factors; 2017.
- I. NFRC 200 Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2014, with Errata (2017).
- J. UL 9 Standard for Fire Tests of Window Assemblies; Current Edition, Including All Revisions.
- K. UL 10B Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- L. UL 10C Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

M. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.

## **PART 2 PRODUCTS**

#### 2.01 FIRE RATED GLAZING

- A. Type: FRG-1 SuperLite® II-XL 60 minute fire protective glazing with fire resistive qualities.
- B. Manufacturer: SuperLite® II-XL as manufactured and distributed by SAFTI FIRST®.
  - 1. Contact: 100 N Hill Drive, Suite 12, Brisbane, CA 94005; Telephone 888.653.3333; email info@safti.com; Web site www.safti.com.
  - 2. Fire rated glass and framing must be provided by a single-source, US manufacturer. Distributors of fire rated glass and framing are not to be considered as manufacturers.

# C. Design Requirements:

- 1. Make-up: Must be comprised of an inboard and outboard lite of [clear tempered] [Starphire Ultra-Clear® glass by Vitro] protecting a clear, fire resistive, intumescent interlayer.
- 2. Thickness: 1-3/8" (35 mm) standard profile.
- 3. Weight: 14-lbs/sq. for standard 1-3/8" (35 mm) standard profile.
- 4. Sound Transmission Rating: Must meet 43 STC/39 OITC in 1-3/8" standard profile; Must meet 43 STC/ 37 OITC insulated with 1/4" Low-E.
- 5. Dimensions: Must meet max. clear view area of 4,952 sq. in., measuring at least 124 in. on the long side.
- 6. Appearance: Must be tint-free, optically clear fire resistive glazing.
- 7. Visible Transmittance: Must meet 0.877 with clear low-iron.
- 8. Fire Rating: Must be fire rated to 60 minutes with hose stream and meet ASTM E-119.
- 9. Impact Safety Resistance: CPSC 16 CFR 1201 Cat. I & II.
- 10. Hard Body Impact Classification: Must meet ASTM C1629/C1629M Level 3.
- 11. Soft Body Impact Classification: Must meet ASTM E695 Level 3.

- 12. Surface Abrasion Resistance: Must meet ASTM D4977 Level 3.
- D. Manufacturer's Fire Rated Glazing Material:
  - 1. Each piece of fire-rated glazing material shall be labeled with a permanent logo including name of product, manufacturer, testing laboratory, fire rating period and safety glazing standards.
  - 2. Glazing materials installed in Hazardous Locations, subject to human impact, shall be certified and permanently labeled as meeting applicable requirements reference in NFPA 80:
    - a. CPSC 16 CFR 1201 Cat. I & II
- E. Substitutions: No substitutions allowed except by addendum prior to bid.

## 2.02 MATERIALS

- A. Glazing Accessories: Manufacturer recommended fire rated glazing accessory as follows:
  - a. Glazing with EPDM tape or other listed flame resistant gasket material and calcium silicate setting blocks.

# 2.03 RELATED PRODUCTS

- A. Glazing shall be installed in an equally rated framing system.
- B. Pressure glazing is allowed.

# 2.04 SOURCE QUALITY

- A. Obtain fire rated glazing products from a single manufacturer.
- B. Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions where practicable within required tolerances.

# **PART 3 EXECUTION**

#### 3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data including product technical bulletins and installation instructions.

#### 3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, have been previously installed under other sections, and are acceptable for product installation in accordance with manufacturer's instructions.

## 3.03 INSTALLATION

A. Installation shall be in strict accordance with the fire glazing material manufacturer's specifications. Field cutting or tampering is strictly prohibited.

## 3.04 CLEANING AND PROTECTION

- A. Protect glass from contact with contaminating substances resulting from construction operations. Remove such substances by method approved by manufacturer.
- B. Wash glass on both faces not more than four days prior to date schedule for inspections intended to establish date of Substantial Completion. Wash glass by method recommended by glass manufacturer.
- C. Remove temporary coverings and protection of adjacent work areas.
- D. Remove construction debris from project site and legally dispose of debris.

This page intentionally left blank

#### SECTION 08 9100 - LOUVERS

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Type 1: Aluminum Drainable Blade Louvers
- B. Frames and Accessories

# 1.02 RELATED REQUIREMENTS

- A. Section 04 2000 Unit Masonry
- B. Section 07 6200 SHEET METAL FLASHING AND TRIM.
- C. Section 07 9005 Joint Sealers.
- D. Section 09 9113 Exterior Painting: Field painting.
- E. Division 15 Mechanical
- F. Section 23 3100 HVAC Ducts and Casings: Ductwork attachment to louvers.

#### 1.03 REFERENCE STANDARDS

- A. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum; 2012.
- B. AAMA 2604 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- C. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels: 2013.
- D. AMCA 500-L Laboratory Methods of Testing Louvers for Rating; 2012.
- E. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- F. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- G. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

- H. ASTM B209M Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- I. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- J. ASTM B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

## 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
- C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.
- D. Samples: Submit two samples 2 by 2 inches (50 by 50 mm) in size illustrating finish and color of exterior and interior surfaces.
- E. Test Reports: Independent agency reports showing compliance with specified performance criteria.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Maintenance Data: Include lubrication schedules and adjustment requirements .

## 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

# 1.06 WARRANTY

- A. See Section 01 7800 Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer's warranty against distortion, metal degradation, and connection failures of louver components.
  - 1. Finish: Include twenty year coverage against degradation of exterior finish.

#### PART 2 PRODUCTS

# 2.01 MANUFACTURERS

#### A. Louvers:

- 1. Airolite Company, LLC; \_\_\_\_: www.airolite.com/#sle.
- 2. Ruskin: Basis of Design: ELF6375DX Drainable Stationary Louver
- 3. American Warming and Ventilating: www.awv.com.
- 4. Construction Specialties, Inc; Acoustical Louver: www.c-sgroup.com/#sle.

## 2.02 LOUVERS

- A. Type 1: Stationary Louvers: Horizontal blade, extruded aluminum construction.(Alloy 6063T5)
  - 1. Free Area: 59%, minimum.
  - 2. Bird Screen
  - 3. Construction: all welded, standard frame
  - 4. Blades: Drainable Blade, hidden mullions, 35 degree angle, spaced approximately 5 29/32 inch center to center
  - 5. Frame: 6 inches deep (150 mm deep), channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
  - 6. Aluminum Thickness: Frame 12 gage, 0.0808 inch (2.05 mm) minimum; blades 12 gage, 0.0808 inch (2.05 mm) minimum.
  - 7. Steel Finish: Superior performing organic coating, finished after fabrication.
  - 8. ASTM E 330

#### 1.02 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), \_\_\_\_ alloy, \_\_\_\_ temper.
- B. Formed Aluminum: Formed sheet, ASTM B209 (ASTM B209M), \_\_\_\_ alloy, \_\_\_\_ temper.
- C. Bird Screen: Interwoven wire mesh of steel, 0.063 inch (1.6 mm) diameter wire, 1/2 inch (13 mm) open weave, diagonal design.

D. Primer: Zinc chromate, alkyd type.

# 1.03 ACCESSORIES

- A. Blank-Off Panels: Same material as louver, painted black on exterior side; provide where duct connected to louver is smaller than louver frame, sealing off louver area outside duct.
- B. Fasteners and Anchors: Galvanized steel.
- C. Head and Sill Flashings: See Section 07 6200.
- D. Sealant: as specified in Section 07 9005.

## PART 3 EXECUTION

## 2.01 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.
- B. Verify that field measurements are as indicated.

## 2.02 INSTALLATION

- A. Install Type 1 louver assembly in accordance with manufacturer's instructions.
  - 1. Coordinate with installation of flashings by others.
  - 2. Install louvers level and plumb.
  - 3. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
  - 4. Secure louver frames in openings with concealed fasteners.
  - 5. Install perimeter sealant and backing rod in accordance with Section 07 9005.
  - 6. Coordinate with installation of mechanical ductwork.

# 2.03 CLEANING

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

## END OF SECTION 08 9100

#### SECTION 09 2116 - GYPSUM BOARD ASSEMBLIES

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Acoustic unfaced batt insulation.
- E. Gypsum wallboard.
- F. Joint treatment and accessories.

## 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 1000 Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 07 9200 Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- D. Section 09 3000 Tiling (Tile): for Cementitious Wile Backer Board in lieu of gypsum wall board..

## 1.03 REFERENCE STANDARDS

- A. ASTM C475/C475M Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.
- B. ASTM C645 Standard Specification for Nonstructural Steel Framing Members; 2014.
- C. ASTM C665 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- D. ASTM C754 Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.
- E. ASTM C840 Standard Specification for Application and Finishing of Gypsum Board; 2013.

- F. ASTM C954 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
- G. ASTM C1002 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
- H. ASTM C1396/C1396M Standard Specification for Gypsum Board; 2014.
- I. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- J. GA-216 Application and Finishing of Gypsum Board; 2013.
- K. ICC (IBC) International Building Code; 2015.

# 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
- C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- D. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

# 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum \_\_\_ years of experience.
- B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

## PART 2 PRODUCTS

#### 2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

# 2.02 METAL FRAMING MATERIALS ( for interior partitions, refer to drawings for width & height)

	A.	nufacturers - Metal Framing, Connectors, and Accessories:					
		1.	ClarkDietrich;: www.clarkdietrich.com/#sle.				
		2.	Dietrich Metal Framing: www.dietrichindustries.com.				
		3.	Marino;: www.marinoware.com/#sle.				
		Phillips Manufacturing Company: www.phillipsmfg.com.					
		5.	Substitutions: See Section 01 6000 - Product Requirements.				
	В.	Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet stee of size and properties necessary to comply with ASTM C754 for the spacing indicate with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).					
		1.	Studs: "C" shaped with flat or formed webs with knurled faces.				
		2.	Runners: U shaped, sized to match studs.				
		3.	Ceiling Channels: C-shaped.				
		4.	Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).				
		Resilient Furring Channels: Single or double leg configuration; 1/2 inch (12 mm) channel depth.					
			a. Products:				
			1) Same manufacturer as other framing materials.				
	C.	Cei	ling Hangers: Type and size as specified in ASTM C754 for spacing required.				
2.03 BOARD MATERIALS							
	A.	Manufacturers - Gypsum-Based Board:					
		1.	American Gypsum: www.americangypsum.com.				
		2.	CertainTeed Corporation;: www.certainteed.com/#sle.				
		3.	Georgia-Pacific Gypsum;: www.gpgypsum.com/#sle.				
		4.	Lafarge North America Inc: www.lafargenorthamerica.com.				

	5. National Gypsum Company;: www.nationalgypsum.com/#sle.				
	6.	USG Corporation;: www.usg.com/#sle.			
В.	Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.				
	1.	Application: Use for vertical surfaces and ceilings, unless otherwise indicated.			
	2.	Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.			
	3.	Thickness:			
	a. Vertical Surfaces: 1/2 inch (13 mm).				
		b. Ceilings: 5/8 inch (16 mm).			
		c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.			
	4. Mold Resistant Paper Faced Products:				
	a. American Gypsum Company; M-Bloc Type X.				
		b. Continental Building Products; Mold Defense Type X.			
		c. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.			
		d. National Gypsum Company; Gold Bond Brand XP Gypsum Board. (Basis of Design)			
2.04 G	ypsu	m Wallboard ACCESSORIES			
A.	A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: inch ( mm).				
В.	B. Acoustic Insulation: 1; preformed glass fiber, friction fit type, unfaced. interior gypsum board/metal stud partitions to the full width of the partition full height of the partition <b>In Readiness Center only.</b>				
C.	Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.				
D.	<ul><li>D. Refer to Section 07 2000</li><li>E. Joint Materials: ASTM C475/C475M and as recommended by gypsum board</li></ul>				
E.					

manufacturer for project conditions.

- 1. Paper Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
- 2. Ready-mixed vinyl-based joint compound.
- F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
- G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion resistant.
- H. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
- I. Unfaced Sound Batt Insulation: Provide in all interior (non-building perimeter) walls for full height of wall in full thickness of cavity.
  - 1. ASTM E136, CAN4-114
  - 2. ASTM C665, TYPE I
  - 3. MEA 346-90, ASTEM E-84

## PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

# 3.02 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
  - 1. Laterally brace entire suspension system.
- C. Studs: Space studs at \_\_ inches on center (at 400 mm on center).
  - 1. Extend partition framing to structure in all locations.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

- E. Standard Wall Furring: Install at concrete and masonry walls scheduled to receive gypsum board, not more than 4 inches (100 mm) from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches (600 mm) on center.
- F. Acoustic Furring: Install resilient channels at maximum 24 inches (600 mm) on center. Locate joints over framing members.
- G. Blocking: Install wood blocking for support of:
  - 1. Wall mounted cabinets.
  - 2. Toilet partitions.
  - 3. Toilet accessories.
  - 4. In all locations noted elsewhere
  - 5. As required for the secure installation of any product to be attached to metal /stud gypsum parttions or ceilings

## 3.03 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Provide sound batt insulation in the same thickness as the metal stud wall cavity in all new partitions from floor to top of partition. Unfaced Sound Batts ASTM C665,type 1,and MEA 346-90 requirements ,ASTM E 84, friction fit in metal studs.
- C. Acoustic Sealant: Install in accordance with manufacturer's instructions.
  - 1. Place one bead continuously on substrate before installation of perimeter framing members.
  - 2. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

## 3.04 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

- 1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
- D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- E. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

#### 3.05 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Install Batt Insulation per manufacturers recommendations.
- D. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

#### 3.06 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
  - 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  - 2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
  - 1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

# 3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

# END OF SECTION 09 2116

#### SECTION 09 3000 - TILING

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Tile for shower walls and floors.
- D. 6"x6" quarry tile
- E. Cementitious backer board as tile substrate.
- F. Solid surface soap shelves.
- G. Ceramic accessories.
- H. Ceramic trim.

# 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 Building Concrete Work
- B. Section 07 9005 Joint Sealers.
- C. Section 09 2116 Gypsum Board Assemblies: Installation of tile backer board.
- D. Section 01 6116 Volatile Organic Compound (VOC) restrictions
- E. Section 12 3600 Countertops, Integral Lavatories, and Window Sills
- F. Section 22 4000 Plumbing Fixtures:

# 1.03 REFERENCE STANDARDS

- A. ANSI A108/A118/A136.1 American National Standard Specifications for the Installation of Ceramic Tile (Compendium).; 2013.1.
- B. ANSI A108.1a American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2014.
- C. ANSI A108.1b American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

- D. ANSI A108.1c Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2010).
- E. ANSI A108.4 American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).
- F. ANSI A108.5 American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
- G. ANSI A108.6 American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).
- H. ANSI A108.8 American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).
- I. ANSI A108.9 American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).
- J. ANSI A108.10 American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).
- K. ANSI A108.11 American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
- L. ANSI A108.12 American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
- M. ANSI A108.13 American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).
- N. ANSI A118.3 American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013 (Revised).
- O. ANSI A118.4 American National Standard Specifications for Modified Dry-Set Cement Mortar; 2012 (Revised).
- P. ANSI A118.9 American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).

- Q. ANSI A118.15 American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2012.
- R. ANSI A137.1 American National Standard Specifications for Ceramic Tile; 2013.1.
- S. ASTM C373 Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products, Ceramic Tiles, and Glass Tiles; 2014a.
- T. TCNA (HB) Handbook for Ceramic, Glass, and Stone Tile Installation; 2015.

# 1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

# 1.05 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches (457 by 457 mm) in size illustrating pattern, color variations, and grout joint size variations.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 Product Requirements, for additional provisions.
  - 2. Extra Tile: 1 percent of each size, color, and surface finish combination, but not less than \_\_\_\_\_ of each type.

# 1.06 QUALITY ASSURANCE

A. Maintain one copy of The Tile Council of North America Handbook and ANSI A108 Series/A118 Series on site.

- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- C. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

## **1.07 MOCK-UP**

- A. See Section 01 4000 Quality Requirements, for general requirements for mock-up.
- B. Construct tile mock-up, incorporating all components specified for the location.
  - 1. Minimum size of mock-up is 100 S.F. and should include transitions of patterns/colors as selected by Architect.
  - 2. Demolish mock-up when directed by Architect, and remove debris from the site.

# 1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

#### 1.09 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

## PART 2 PRODUCTS

#### 2.01 TILE

- A. Manufacturers: See paragraphs B., C., and, D.
  - 1. Substitutions: See Section 01 6000 Product Requirements.
- B. Quarry Tile, Type \_\_: ANSI A137.1, standard grade., American Olean or approved equivalent product
  - 1. Moisture Absorption: 0.5 to 3.0 percent as tested in accordance with ASTM C373.
  - 2. Size: 6 by 6 inch (152 by 152 mm), nominal.
  - 3. Thickness: 1/2 inch (12.7 mm), nominal.
  - 4. Edges: Cushioned.
  - 5. Surface Finish: Unglazed.
  - 6. Color(s): To be selected by Architect from manufacturer's standard range.

- 7. Trim Units: Matching cove base shapes in 6".
- C. Porcelain Mosaic Tile: ANSI A137.1, and as follows:
  - 1. Simply Modern manufactured by Stonepeak (Made in USA) or approved equivalent product.
  - 2. Moisture Absorption: 0 to 0.5 percent.
  - 3. Size and Shape: 2 inch square (50 mm square).
  - 4. Surface Finish: Unglazed. Honed
  - 5. Colors: To be selected by Architect from manufacturer's standard range.
  - 6. Provide at accent band wall tile in shower and at shower floor.
- D. Wall and Floor Tile: ANSI A137.1, and as follows:
  - 1. Simply Modern manufactured by Stonepeak or approved equivalent product.
  - 2. Moisture Absorption: 0 to 0.5 percent.
  - 3. Size and Shape:12x12 and 12x24.
  - 4. Thickness: 3/8 inch (9.5 mm)
  - 5. Face: Plain.
  - 6. Edges: Square.
  - 7. Surface Finish: Honed finish.
  - 8. Colors: To be selected by Architect from manufacturer's standard range.
  - 9. 6" x 12" cove base

# 2.02 TRIM AND ACCESSORIES

- A. Porcelain Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.
  - 1. Triangular Soap Dish: Provide (2) 1/2" Thick Bullnosed Corner shelves made of solid surface material that matches thresholds (minimum 9"x9" each side) for each shower stall Install in locations as directed by Architect and Owner. Ease exposed edges.

	Huntsville Readiness Center Huntsville, AL			SS&L# 21112	November 1, 2024		
В	3.	Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.					
		1.	Applications:				
			a. Open Edges: Bul	llnose. Provide at top of sho	ower wall tile.		
				nts: 6 x 12 Cove base at toil er. (1x6 in Corner, 1x6 out 0	et rooms and showers as available Corner, 3x12 Bullnose)		
		2.	Manufacturers: Same	as for tile.			
C	7.	. Thresholds: Marble, match tile color, honed finish; 4 inches ( mm) wide by ful width of wall or frame opening; 1/2 inch thick (12 mm thick); beveled one long edg with radiused corners on top side; without holes, cracks, or open seams. Solid surf material equal to Corian bay be used as equal to marble material.					
	1. Applications: Provide a			e at the following locations:	Comply with ADA		
			a. At doorways whe	ere tile terminates.			
			b. At open edges of	floor tile where adjacent fir	nish is a different height.(Shower)		
			c. Refer to drawings	S.			
2.03 SETTING MATERIALS							
A	A. Manufacturers:						
		1.	ARDEX Engineered	Cements;: www.arde	examericas.com/#sle.		
		2.	Bostik Inc;: w	ww.bostik-us.com/#sle.			
		3.	LATICRETE Internat	cional, Inc;: www.la	ticrete.com/#sle.		
		4.	ProSpec, an Oldcastle	brand;: www.prosp	pec.com.		
В	3.	Late	ex-Portland Cement Mo	ortar Bond Coat: ANSI A1	18.4, ANSI A118.15, or		
		1.	Applications: Use thi	s type of bond coat where i	ndicated and where no other type		

a. ARDEX Engineered Cements; ARDEX X 77 MICROTEC: www.ardexamericas.com.

of bond coat is indicated.

2.

Products:

- b. LATICRETE International, Inc; LATICRETE 254 Platinum: www.laticrete.com.
- c. ProSpec, an Oldcastle brand; Permalastic System: www.prospec.com.
- d. Substitutions: See Section 01 6000 Product Requirements.
- C. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
  - 1. Applications: at all thick mortar bed applications.
  - 2. Products:
    - a. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.
    - b. ProSpec, an Oldcastle brand; B-7000 Epoxy Mortar and Grout: www.prospec.com.
- D. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.
  - 1. Products:
    - a. LATICRETE International, Inc; LATICRETE 3701 Fortified Mortar Bed: www.laticrete.com/#sle.
    - b. Substitutions: See Section 01 6000 Product Requirements.

## 2.04 MORTAR MATERIALS

- A. Manufacturers: Product to have manufacturers literature ensuring 10 year installation warranty against delamination on new tile over existing tile.
- B. Mortar Bed Materials: Portland cement, sandand water.
- C. Mortar Bond Coat Materials:
  - 1. Latex-Portland Cement type: ANSI A118.4.
- D. Must be recommended by manufacturer for specific use and acceptable with other specified product prior to ordering of material. Submit written recommendation for approval by Architect.

#### **2.05 GROUTS**

- A. Manufacturers: (Basis of Design): Epoxy grout at 6x6 Quarry Tile; Laticrete Spectralock Pro IG Epoxy grout; (Basis of Design) Latticrete Spectralok 1 or equal at all other applications.
  - 1. Bonsal American, Inc: www.prospec.com
  - 2. Bostik Inc; \_\_\_\_: www.bostik-us.com/#sle.
  - 3. Custom Building Products: www.custombuildingproducts.com.
  - 4. Mapei
  - 5. Substitutions: See Section 01 6000 Product Requirements.
- B. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
  - 1. Applications: Where indicated.
  - 2. Products:
    - a. Custom Building Products; CEG-IG 100% Solids Industrial Grade Epoxy Grout: www.custombuildingproducts.com/#sle.
    - b. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
    - c. ProSpec, an Oldcastle brand; B-7000 Epoxy Mortar and Grout: www.prospec.com.
- C. Standard Grout: Stain Free, submit samples for Architect approval.
  - 1. Colors: To be selected by Architect from manufacturer's standard range.

#### 2.06 ACCESSORY MATERIALS

- A. Crack Suppression Membrane (at all floors). Specifically designed for bonding to substrate. Equal to Latticrete Blue 92 Trowel applied flexible fiber- mesh-reinforced waterproofing and crack isolation membrane. Install at all floors to receive hard tile. Turn membrane up wall 6" where where adjacent walls are to receive hard tile. Verify compatability with adjacent materials. Follow manufacturers recommended techniques in reference to application and number of coats.
- B. Waterproofing/Crack Suppression Membrane all shower floors, shower walls, all toilet room floors, and extending perpendicular walls for six feet: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying

#### with ANSI A118.10.

Material: Latticrete 9235 liquid rubber polymer. Follow manufacturers
recommended techniques in reference to number of coats. At all inside corners and
wall to floor junctions and other manufacturer recommended locations provide
fiber glass mesh in manufacturers recommendations.

SS&L# 21112

- C. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 5/8 inch (\_\_\_\_ mm) thick; 2 inch (51 mm) wide coated glass fiber tape for joints and corners, ASTM C1325
  - 1. Products:
    - a. Custom Building Products; WonderBoard Lite Backerboard: www.custombuildingproducts.com/#sle.
    - b. James Hardie.
    - c. Substitutions: See Section 01 6000 Product Requirements.
  - 2. Product: Equal to USG Durock with edge guard. \_\_\_\_\_.
  - 3. Install at all metal stud tiled wall applications. Provide all tape and manfacturer recommended accessories.
- D. Mesh Tape: 2 inch (50 mm) wide self-adhesive fiberglass mesh tape.
- E. Substitutions: Section 01 6000 Product Requirements

## PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

F. Verify that existing tile surfaces are acceptable substrate for new tile. Prepare substrate as required for installation per 10 year delamination warranty.

# 3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

# 3.03 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern as directed by Architect on Job Site Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Install thresholds where indicated.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep control and expansion joints free of mortar, grout, and adhesive.
- J. Keep expansion joints free of adhesive or grout. Apply sealant to joints. Sealant to match grout color.
- K. Allow tile to set for a minimum of 48 hours prior to grouting or more if recommended by manufacturer.

- L. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
- M. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
- N. When Contractor begins installation of tile, this shall indicate his acceptance of substrate.
- O. Installation of waterproof membrane shall be per manufcaturer's instructions. Provide at shower floor and walls, 6' high at all tiled plumbing walls and 6' high and 6' horizontally at tiled walls adjacent to plumbing walls, unless noted otherwise.

#### 3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates with existing mosaic tile, install in accordance with The Tile Council of North America Handbook Method F-122, with stain free urethane grout, unless otherwise indicated. Provide crack suppression membrane to all tile floor areas where required to cover existing cracks. Provide waterproof membrane over thick mortar bed at shower floors. Verify prior to bid.

# 3.05 INSTALLATION - FLOORS - MORTAR BED METHODS - Floors & Shower Floors

- A. Showers, Kitchen Floor, and miscellaneous other areas.
- B. Over interior concrete substrates, install in accordance with The Tile Council of North America Handbook Method F121 with fortified mortar and epoxy grout at (6x6 quarrty tile and 2x2 shower floors), mortar bed thickness as required, unless otherwise indicated. Provide waterproofing crack suppression membrane and waterproof membrane as noted..

# 3.06 INSTALLATION - WALL TILE thin set on Concrete Masonry Units

- A. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat. Provide waterproof membrane as noted in showers walls and all toilet room plumbing walls and a minimum 6 feet on side walls away from plumbing walls.
- B. Full Body Porcelain (12"x12") where required to cover existing cracks. Verify prior to

# 3.07 INSTALLATION - WALL TILE thin set on Metal Stud Walls with Cementitious Backer Board

A. Over cementitious backer units install in accordance with TCNA (HB) Method W223, organic adhesive.

# 3.08 CLEANING

A. Clean tile and grout surfaces.

# 3.09 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

# 3.10 SCHEDULE

- A. Refer to drawings for the locations of tile, the type of tile, and the patterns of tile
- B. Kitchen and Food Storage:
  - 1. Tile: Quarry tile.
  - 2. Installation Method: Mortar bed.
  - 3. Grout and Mortar Bond Coat: Epoxy.

# END OF SECTION 09 3000

#### SECTION 09 5100 - ACOUSTICAL CEILINGS

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

# 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 26 5100 Interior Lighting: Light fixtures in ceiling system.

# 1.03 REFERENCE STANDARDS

- A. ASTM C635/C635M Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
- B. ASTM C636/C636M Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
- C. ASTM E1264 Standard Classification for Acoustical Ceiling Products; 2014.
- D. NFPA 286 Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.
- E. UL (FRD) Fire Resistance Directory; current edition.

# 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

# 1.05 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components.
- C. Samples: Submit two samples 6 x6 inch (\_\_\_\_by\_\_\_ mm) in size illustrating material and finish of acoustical units.

- D. Samples: Submit two samples each, 12 inches (\_\_\_\_ mm) long, of suspension system main runner.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 Product Requirements, for additional provisions.

# 1.06 QUALITY ASSURANCE

- A. Fire-Resistive Assemblies: Complete assembly listed and classified by {\rs\#1} for the fire resistance indicated.
- B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

## 1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

#### PART 2 PRODUCTS

# 2.01 MANUFACTURERS

- A. Acoustic Panels: Type 1
  - 1. Armstrong World Industries, Inc: www.armstrong.com.( Basis of Design-Armstrong Fine Fissured 1728, USG Radar 2210, 2x2 x 5/8 inch with 15/16" Square Layin), sag resistance Humid guard Plus, Class A, ASTM 84, ASTM E1264, Meets CA dept. of health VOC Emissions, Anti Mold & Bacteria Bio-Block, 1.5 R Value. (BTU units), 30 year manufacturers warranty
    - a. 2x4x5/8" panels to be placed into existing grid, refer to drawings.
  - 2. CertainTeed Corporation; \_\_\_\_: www.certainteed.com/#sle.
  - 3. USG; \_\_\_\_: www.usg.com/#sle.
  - 4. Substitutions: See Section 01 6000 Product Requirements.

- B. Acoustic Panels: Type 2
  - 1. Vinyl Coated Gypsum Board USG Clima Plus 3260, 2x2 x 1/2" or with 15/16 inch Square layin.

# C. Suspension Systems:

- 1. Armstrong World Industries, Inc; \_\_\_\_: www.armstrong.com. (basis of design Prelude XL 7300 15/16" white) approved equals must meet basis of design: Donn DX, Chicago Metallic 1200,USG DX Heavy duty 15/16, 10 year warranty, 10 year warranty with Humid guard plus products, Superlock, hot dipped Galvanized coating, secure lock connection.
- 2. CertainTeed Corporation; \_\_\_\_: www.certainteed.com/#sle.
- 3. USG; \_\_\_\_: www.usg.com/#sle.
- 4. Donn:
- 5. Substitutions: See Section 01 6000 Product Requirements.

# 2.02 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.

# 2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Touch-up Paint: Type and color to match acoustical and grid units.
- C. Clean and touch up existing grid to remain.

#### PART 3 EXECUTION

## 3.01 INSTALLATION - SUSPENSION SYSTEM

- A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- B. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

- C. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- F. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.
- G. Do not eccentrically load system or induce rotation of runners.

## 3.02 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
  - 1. Make field cut edges of same profile as factory edges.
- G. Install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.

#### 3.03 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

## **END OF SECTION 09 5100**

#### **SECTION 09 6513 - RESILIENT BASE**

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

A. Resilient base.

## 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.
- B. Section 09 0561 Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

# 1.03 REFERENCE STANDARDS

- A. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- B. ASTM F1913 Standard Specification for Vinyl Sheet Floor Covering Without Backing; 2004 (Reapproved 2014).
- C. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2017.
- D. <u>ASTM E662</u> Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 2013b.
- E. ASTM F137 Standard Test Method for Flexibility of Resilient Flooring; 2011
- F. <u>ASTM F1514</u> Standard Test Method for Measuring Heat Stability for Color Change; 2003 (Reapproved 2008)
- G. <u>ASTM F1515</u> Standard Test Method for Measuring Light Stability of Resieleint Flooring by Color Change; 2003 (Reapproved 2008)
- H. <u>ASTM F1914</u> Standard Test Method for Short-Term Indention and Residual Indention of Resileint FLoor Covering; 2007 (Reapproved 2011)
- I. <u>ASTM F1869</u> Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anydrous Calcium Chloride; 2011

# 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Shop Drawings: Indicate seaming plans and floor patterns.
- C. Verification Samples: Submit two samples, 12 by 12 inch (\_\_\_ by \_\_\_ mm) in size illustrating color and pattern for each resilient flooring product specified.
- D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 Product Requirements, for additional provisions.
  - 2. Extra Materials/ Attic Stock: Quantity equivalent to 3 percent of each type and color.

# 1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

# 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).
- D. Protect roll materials from damage by storing on end.
- E. Do not double stack pallets.

## 1.07 FIELD CONDITIONS

- A. Maintain ambient temperatures as recommeded by the manufacturer but not less than 65 degrees or more than 85 degrees.
- B. Maintain the ambient relative humidity between 40-60% during installation.

#### PART 2 PRODUCTS

# 2.01 RESILIENT BASE (RB-1) - SEE FINISH SCHEDULE

- A. Traditional Rubber Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
  - 1. Manufacturers:
    - a. Mannington Commercial; www.manningtoncommercial.com/
    - b. Johnsonite, a Tarkett Company; \_\_\_\_\_: www.johnsonite.com/#sle.
    - c. Roppe Corp; \_\_\_\_: www.roppe.com/#sle.
    - d. Substitutions: See Section 01 6000 Product Requirements.
  - 2. Length: Roll.
  - 3. Height: 4" tall
  - 4. Color: As selected by Owner and Architect from Manufacturer's full range.
  - 5. Color: Refer to finish schedule.
  - 6. Accessories: Premolded external corners.
  - 7. Style: Cove (with top-set toe)

## PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
  - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive manufacturer.
- C. Flooring manufacturers to give architect written approval that substrate is acceptable prior to commencing with any floor installation. This shall not add any cost to the owner or time to the contract schedule.

- D. Refer to paragraph 1.03 References for floor substrate testing.
- E. Surface cracks, grooves, depressions, control joints or other non-moving joints, and other irregularities shall be filled or smoothed with patching or underlayment compound recommended by the resilient flooring manufacturer and for job conditions for filling or smoothing, or both. The flooring contractor shall include these cost in their bid.
  - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

#### 3.02 Installation - General

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.

# 3.03 Installation - Resilient Base

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.

#### 3.04 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

## 3.05 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.
- B. No heavy traffic, rolling loads or furniture for 72 hours after installation.

#### END OF SECTION 09 6513

# SECTION 09 6519 - RESILIENT TILE FLOORING

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Resilient tile flooring.
- B. Installation accessories:
  - 1. Adhesives.
  - 2. Finishes and cleaners.

# 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 Volatile Organic Compound (VOC) Content Restrictions: SCS FloorScore certification documentation.
- B. Section 01 7419 Construction Waste Management and Disposal.
- C. Section 03 3000 Cast in Place Concrete
- D. Section 07 9200 Joint Sealants.
- E. Section 09 0561 Common Work Results from Flooring Prep

#### 1.03 REFERENCE STANDARDS

- A. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine; 2011.
- B. ASTM E662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 2018.
- C. ASTM F137 Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus; 2008 (Reapproved 2013).
- D. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- E. ASTM F970 Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading; 2017.
- F. ASTM F1514 Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color Change; 2003 (Reapproved 2013).

- G. ASTM F1515 Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change; 2003 (Reapproved 2008).
- H. ASTM F1700 Standard Specification for Solid Vinyl Floor Tile; 2013a.
- I. ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.
- J. ASTM F1914 Standard Test Method for Short-Term Indentation and Residual Indentation of Resilient Floor Covering; 2007 (Reapproved 2011).
- K. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2017.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Manufacturer's documentation for flooring and accessories:
  - 1. Technical Data.
  - 2. Installation and Maintenance.
  - 3. Warranty.
- C. Verification Samples: Submit two samples, 18 by 18 inch (457.2 by 457.2 mm) in size illustrating color and pattern for each resilient flooring product specified.
- D. Verification Samples: Submit two samples, full size, illustrating color and pattern for each resilient flooring product specified.

# 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and that the material is of the correct style, color, quantity and run number(s).
- B. Store all materials flat and off of the floor in an acclimatized, weather-tight space between 65 to 85 degrees F (18 to 29 degrees C).
- C. Do not double stack pallets.

## 1.06 FIELD CONDITIONS

A. Acclimate material at jobsite between 65 to 85 degrees F (18 to 29 degrees C) and 35 percent to 85 percent relative humidity for 48 hours prior to installation. Temperature and relative humidity should also be maintained at the same levels during installation,

and after installation.

- B. Spread unopened cartons no more than 6 cartons high and at least 4 inches (101 mm) apart.
- C. Keep away from heating and cooling ducts and direct sunlight.
- D. If permanent HVAC is not operational, temporary means should be used to maintain the recommended temperature and relative humidity levels.
- E. Close areas to traffic during installation of flooring and accessories.

## 1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Should only be installed by professional flooring mechanics that have demonstrated successful installations of jobs in similar size and scope.

#### 1.08 WARRANTY

A. Manufacturer's 10-Year Limited Commercial Warranty for Linear Vinyl Flooring

# **PART 2 PRODUCTS**

#### 2.01 MANUFACTURERS

- A. Linear Vinyl Tile Basis of Design: Tarkett, Event+ Series LVT
- B. Substitutions: See Section 01 6000 Product Requirements.

#### 2.02 RESILIENT TILE FLOORING

- A. Linear Vinyl Flooring: (LVT-1) for Basis of Design.
  - 1. Color: As selected from manufacturer's full range.
  - 2. Physical Properties:
    - a. Finish: Techtonic
    - b. Wear Layer Thickness: 30 mil (0.76 mm).
    - c. Total Thickness (Gauge): .120"; min. 3 mm
    - d. Style: Tile 18" x 18"

- e. Installation: Glue Down
- 3. Manufacturing, Performance, and Safety Standards:
  - a. ASTM F1700, Classification: Class III, Type B performance
  - b. ASTM F1914, Residual Indentation: Meets requirements.
  - c. ASTM F137, Flexibility: Meets requirements.
  - d. ASTM F1514, Resistance to Heat: Meets requirements.
  - e. ASTM F1515, Resistance to Light: Meets requirements.
  - f. ASTM E662, Smoke Density (Flaming and Non-Flaming): Passes requirements.
  - g. ASTM D2047, Coefficient of Friction (Dry): Greater than or equal to 0.65
  - h. ASTM F970, Static Load Limit: 250 psi
  - i. ASTM F925, Chemical Resitance: Meets requirements.
- B. Moldings, Transition and Edge Strips: See dwgs for transition details.
- C. Adhesive and Adhesive Encapsulators: As recommended by flooring manufacturer.
- D. Finishes and Cleaners: As recommended by flooring manufacturer.

## **PART 3 EXECUTION**

# 3.01 EXAMINATION \_\_\_\_

- A. Install flooring and accessories after other operations (including painting) have been completed.
- B. Acceptance of Conditions: Carefully examine all installation areas with installer/applicator present, for compliance with requirements affecting work performance.
  - 1. Verify that field measurements, product, adhesives, substrates, surfaces, structural support, tolerances, levelness, temperature, humidity, moisture content level, pH, cleanliness and other conditions are as required by the manufacturer, and ready to receive work.
- C. Verify that substrate is contaminant-free, including old adhesives and any chemicals.
- D. Test substrates as required by manufacturer to verify proper conditions exist.

#### Concrete:

- a. Check for concrete additives such as fly ash, curing compounds, hardeners, or other surface treatments that may prevent proper bonding of floor coverings.
- b. Moisture testing: Perform either the In-Situ Relative Humidity (RH) test (ASTM F2170) or Moisture Vapor Emission Rate (MVER) test (ASTM F1869). Refer to the Manufacturer's Installation Guide/Manual for the maximum allowable substrate moisture content. Substrates above the maximum allowable moisture content will require a moisture mitigation system.
- c. Perform alkalinity testing to verify pH level is between 5 to 9 per ASTM F710
- E. Verify that required floor-mounted utilities are in correct location.

## 3.02 PREPARATION

- A. Prior to installation, the flooring installer should plan and attend an on-site construction meeting with the General Contractor, Architect and Property Owner to review all requirements and inspect site conditions as outlined in the manufacturer's installation document, as well as to review the requirements of ASTM F710 and any relevant building codes, or local, state, or national regulations.
- B. Flooring installation should not begin until all site conditions have been assessed, testing has been completed and subfloor conditions have been approved.
- C. Prepare per manufacturer's written instructions, Section 01 7000, and as follows:
  - 1. Prepare substrates to ensure proper adhesion of Linear Vinyl Plank and Tile Flooring.
  - 2. Concrete Substrates: Prepare substrate per ASTM F710.
    - a. Verify that subfloor is clean, flat, smooth, free of dirt, rust, paint, oil, wax or any contaminant that will interfere with adhesive bonding.
    - b. Mechanically remove substrate coatings that are not compatible with adhesives, such as sealers, curing, hardening or parting compounds, soap, wax, oil, etc.
      - 1) Do not use solvents or adhesive removers.
    - c. Expansion joints, isolation joints, or other moving joints must be honored and must not be filled with underlayment products or other materials, and floor

- coverings must not be laid over them. Expansion joint covering systems should be detailed by the architect or engineer, and based upon intended usage and aesthetic considerations.
- d. Surface cracks, grooves, depressions, control joints or other non-moving joints, and other irregularities shall be filled or smoothed with high-quality Portland cement or calcium aluminate based patching or underlayment compound for filling or smoothing, or both.
  - 1) Do not skim-coat large areas with patching compound, especially slick power-troweled surfaces.
  - 2) Sand smooth per manufacturer's instructions.
- e. Slick surfaces such as power-troweled concrete shall be profiled as needed to allow for a mechanical bond between the adhesive and subfloor.
- f. Do not use gypsum-based underlayment products and do not skim coat concrete subfloors.
- g. Self-Leveling Underlayments: Provide a dry and smoothly-sanded underlayment substrate ready for installation of Linear Vinyl Plank Underlayment compound shall be moisture-resistant, mildew-resistant, and alkali-resistant and must have a minimum of 3,000 psi compressive strength per ASTM C109/C109M prior to installation of underlayment provide architect written approval by flooring manufacturer citing all specified warranties will be in affect.
- h. Lightweight concrete shall have a compressive strength greater than 90 pounds per cubic foot with minimum compression strength of 2,500 psi or greater.
- 3. Existing and Other Substrates:
  - a. Refer to manufacturer's professional installation guide and/or contact manufacturer, as special conditions may exist.

#### 3.03 INSTALLATION

- A. Installation per manufacturer's written instructions and as follows:
  - 1. Layout shall be specified by Architect, Designer or End User.
  - 2. Follow layout and ensure installation reference lines are square.

- 3. Field tiles shall be installed with directional arrows on back aligned in the same direction, or may be installed in quarter-turned fashion.
- 4. Check cartons for and do not mix dye lots.
- 5. Expansion Joints: Locate expansion, isolation, and other moving joints prior to installation.
  - a. Do not fill expansion, isolation, and other moving joints with patching compound nor cover with resilient flooring.
  - b. Install movement joint systems per manufacturer's instructions.
- 6. Adhesives: Adhere flooring to substrate using the full spread method resulting in a completed installation without gaps, voids, raised edges, bubbles or any other surface imperfections.
  - a. Select appropriate adhesive, trowel and follow manufacturer's instructions.
  - b. Periodically spot-check transfer of adhesive to back of tile during installation.
  - c. Roll floor with a 100 pound roller to ensure proper transfer of adhesive and bonding.
  - d. Protect floor from traffic per manufacturer's instructions.
  - e. Do not wet mop floor until the adhesive has properly set per written instructions.

## 3.04 FIELD QUALTITY CONTROL

- A. Site tests and inspections per Section 01 4000 and as follows:
  - 1. Inspect flooring installation for non-conforming work including (but not limited to) the following:
    - Lack of adhesion.
    - b. Bubbles, loose tiles or raised edges.
    - c. Dirt and debris underneath flooring.
    - d. Excessive gaps.
    - e. Improper substrate preparation (as indicated by telegraphing).

- f. Damage to tiles, including: dents/indentations, cuts, cracks, burns or punctures.
- B. Non-conforming work per General Conditions and as follows:
  - 1. Repair or replace damaged material if not acceptable to the Architect.

### 3.05 CLEANING

- A. Waste Management per Section 01 7000 and as follows:
  - 1. Coordinate material reclamation program with manufacturer, if applicable.
    - a. Store and return cartons and pallets to manufacturer or recycler for reuse or recycling.
- B. Provide progress cleaning per manufacturer's written instructions, Section 01 7000, and as follows:
  - 1. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the work.
    - a. Clean and protect completed construction until Date of Substantial Completion.
    - b. During installation, remove wet adhesive from surface of flooring per manufacturer's instructions.
  - 2. Site: Maintain project site free of waste materials and debris.
- C. Provide final cleaning immediately prior to Date of Final Completion inspection per manufacturer's written instructions and Section 01 7000 and 01 7800
  - 1. Protection: Remove manufacturer's and other installed protection immediately prior to Date of Final Completion inspection, unless required otherwise.
  - 2. Clean floor with a neutral 6-8 pH cleaner or as recommended by manufacturer.

## 3.06 MAINTENANCE

A. Initial maintenance per flooring manufacturer's written instructions.

## 3.07 PROTECTION

A. Protect materials from construction operations until Date of Final Completion or Owner occupancy, whichever occurs first.

- 1. Protect finished floor from abuse and damage by using heavy non-staining kraft paper, drop cloths or equivalent. Use additional, non-damaging protective materials as needed.
- 2. Light foot traffic on a newly installed floor can be permitted after 24 hours.
- 3. Keep heavy traffic and rolling loads off the newly installed LVT flooring for 48 hours.
- 4. Protect the floor from rolling loads by covering with protective boards.

This page intentionally left blank

### SECTION 09 6566 - RESILIENT ATHLETIC FLOORING

## PART 1 GENERAL

## 1.01 RELATED REQUIREMENTS

A. Section 09 6513 - Resilient Base.

## 1.02 REFERENCE STANDARDS

- A. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.
- B. ASTM D2240 Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).
- C. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- D. ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.
- E. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2017.
- F. ASTM F2772 Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems; 2011.
- G. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- H. CHPS (HPPD) High Performance Products Database; Current Edition at www.chps.net/.
- I. DIN EN 14904 Surfaces for Sports Areas Indoor Surfaces for Multi-Sports Use Specification; 2006.

## 1.03 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified.
- C. Selection Samples: Manufacturer's color charts for flooring materials specified, indicating full range of colors and textures available.

- D. Verification Samples: Actual flooring material specified, not less than 12 inch (305 mm) square, mounted on solid backing.
- E. Test Reports: Submit test reports showing compliance with DIN EN 14904.

## 1.04 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer certified in writing by the flooring manufacturer to be qualified for installation of specified flooring system.

## 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.
- B. Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

## 1.06 FIELD CONDITIONS

A. Maintain temperature in spaces to receive adhesively installed resilient flooring within range of 70 to 95 degrees F (21 to 35 degrees C) for not less than 48 hours before the beginning of installation and for not less than 48 hours after installation has been completed. Subsequently, do not allow temperature in installed spaces to drop below 50 degrees F (10 degrees C) or to go above 100 degrees F (38 degrees C).

#### PART 2 PRODUCTS

#### 2.01 PREFORMED ATHLETIC FLOORING

- A. Manufacturers: All products by the same manufacturer.
  - 1. Johnsonite, a Tarkett Company: https://commercial.tarkett.com/
  - 2. Substitutions: See Section 01 6000 Product Requirements.
- B. Rubber Athletic Tile Flooring
  - 1. Complies with requirements for ASTM F1344 Standard Specifications for Rubber Floor Tile lass 1-A and 1-B.
  - 2. Tile manufactured of dual durometer layers composed of 100% synthetic and natural rubber.
  - 3. Tile is two-ply vulcanized construction which incorporates a rubber wear layer and an elastic cushioned performance layer.

- 4. Spike and Skate Resistant
- 5. Wear layer thickness: .090" (2.3 mm)
- 6. Overall thickness: 3/8" [.375"(9.5 mm)
- 7. Tile size shall be 24"x24"
- 8. Tile shall be a glue-down application.
- 9. Tile Design texture and color to be determined by the Architect.
- 10. ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated FLooring of 0.6 or greater.
- 11. ASTM F 970, Standard Test Method for Static Load Limit passes 250 PSI.
- 12. ASTM D 3389 Standard Test Method for Coated Fabrics Abrasion Resistance: < 1.00 gram weight loss.
- 13. ASTM E 648 Standard Test method for Critical Radiant Flux of 0.45 watts/square centimeter or greater, Class I.

#### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Examine substrates with Installer present, for compliance with requirements of maximum moisture content and other conditions affecting performance of the work. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of athletic flooring to substrate.

# 3.02 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion or acceptance of resilient athletic flooring.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove substrate coatings and other substances that are incompatible with adhesives or contain soap, wax, oil, solvents, or silicone, using mechanical methods recommended by manufactuer. Do not use solvents.

- 3. Mechanically remove contamination on the substrate that may cuase damage to the resilient athletic flooring material. Permanent and non-permenant markers, pens, crayons, paint, etc. must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
- 4. Prepare substrates according to ASTM F 710 including the following:
  - a. Floor glue down tile:
    - 1) Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
    - 2) Perform anhydrous calcium test, ASTM F 1869. Results must not exceed 5 Ibs. Moisture Vapor Emission Rate per 1,000 sq. ft. in 24 hours. OR
      - (a) Perform relative humidity test using in situ probes, ASTM F 2170. Must not exceed 80%.
    - 3) A pH test for alkilinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.
- B. Fill cracks, holes, depressions, and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Floor covering shall not be installed over expansion joints.
- D. Do not install resilient products until they are the same temperature as the space where they will be installed. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

#### 3.03 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Comply with manufacturer;s written instructions for installing resilient athletic flooring..
- C. Resilient Athletic Rubber Tile Flooring

- 1. Installed with manufacturer's adhesive specified for the site conditions and follow adhesive label for proper use.
- 2. Do not Quarter Turn tile.
- 3. Roll the flooring in both directions using a 100 pound three-section roller.

### 3.04 CLEANING

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surface to removed marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixutes during remainder of construction period.
  - 1. No traffic for 24 hours after installation.
  - 2. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

## 3.05 PROTECTION

A. Protect finished athletic flooring from construction traffic to ensure that it is without damage upon Date of Final Acceptance.

#### END OF SECTION 09 6566

This page intentionally left blank

## **SECTION 09 9000 - PAINTING AND COATING**

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. Do Not Paint or Finish the Following Items:
  - 1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
  - 2. Pre-engineered prefinished metal building components. Including primed structural members, unless noted on finish schedule in a room as paint walls.
  - Items indicated to receive other finishes.
  - 4. Items indicated to remain unfinished.
  - 5. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
  - 6. Non-metallic roofing and flashing.
  - 7. Stainless steel, anodized aluminum, bronze, terne, and lead items.
  - 8. Floors, unless specifically so indicated. (refer to finish schedule)
  - 9. Toilet Accessories and Toilet Partitions+
  - 10. Concealed pipes, ducts, and conduits.

## 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 5000 Metal Fabrications: Shop-primed items.
- C. Section 09 2116 Gypsum Board Assemblies

#### 1.03 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

#### 1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- C. ASTM D4442 Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. GreenSeal GS-11 Paints and Coatings; 2013.

## 1.05 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:
  - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
  - 2. MPI product number (e.g. MPI #47).
  - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
- C. Product Data: Provide data on all finishing products, including VOC content.
- D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
- E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
- F. Samples: Provide samples of all colors and types of coatings, proceed only after receiving owner written approval and architect written approval.
- G. Manufacturer's Instructions: Indicate special surface preparation procedures.

- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 Product Requirements, for additional provisions.
  - 2. Extra Paint and Coatings: 1 gallon (4 L) of each color; store where directed.
  - 3. Label each container with color in addition to the manufacturer's label.

## 1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

#### 1.07 MOCK-UP

- A. See Section 01 4000 Quality Requirements, for general requirements for mock-up.
- B. Provide panel, 10 feet (10 m) long by 10 feet (\_\_\_\_ m) wide, illustrating special coating color, texture, and finish.
- C. Provide door and frame assembly illustrating paint coating color, texture, and finish.
- D. Locate where directed.
- E. Mock-up may remain as part of the work.

## 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

#### 1.09 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

## **PART 2 PRODUCTS**

#### 2.01 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Provide all paint and coating products from the same manufacturer to the greatest extent possible.

#### C. Paints:

- 1. Base Manufacturer: Sherwin-Williams.
- 2. Behr Process Corporation: www.behr.com/#sle.
- 3. Glidden Professional, a product of PPG Architectural Coatings: www.gliddenprofessional.com.
- 4. Benjamin Moore & Co: www.benjaminmoore.com/#sle.
- 5. PPG Paints: www.ppgpaints.com/#sle.
- 6. Pratt & Lambert Paints: www.prattandlambert.com/#sle.

## D. Transparent Finishes:

- 1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- E. Primer Sealers: Same manufacturer as top coats.
- F. Block Fillers: Same manufacturer as top coats.
- G. Substitutions: See Section 01 6000 Product Requirements.

#### 2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
  - 1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
  - 2. Supply each coating material in quantity required to complete entire project's work from a single production run.

- 3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
  - 1. Gypsum Board: Interior Latex Primer Sealer; MPI #50.
  - 2. Wood: Latex Primer for Interior Wood; MPI #39.
  - 3. Steel, Uncoated: Anti-Corrosive Alkyd Primer for Metal; MPI #79.
  - 4. Steel, Uncoated: Interior Rust-Inhibitive Water Based Primer; MPI #107.
  - 5. Steel -- Shop Primer: Interior/Exterior Quick Dry Alkyd Primer for Metal; MPI #76.
- C. Volatile Organic Compound (VOC) Content:
  - 1. Provide coatings that comply with the most stringent requirements specified in the following:
    - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
  - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Colors: To be selected from manufacturer's full range of available colors.

#### 2.03 PAINT SYSTEMS - EXTERIOR

- A. Paint E-OP All Exterior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including concrete.
  - 1. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
  - 2. Primer(s): As recommended by manufacturer of top coats.
- B. Paint CE-OP-3L Masonry/Concrete, Opaque
  - 1. Primer: B25W00025 PrepRite Block Filler White.
  - 2. \*\*Prime Coat if needed on raw block

- 3. 2 Coats: A05W00451 ConFlex XL High Build Coating Extra White
- 4. Elastomeric Coating
- 5. Colors as selected by Owner and Architect.
- C. Paint ME-OP-2A Ferrous Metals, Primed, Alkyd, 2 Coat:
  - 1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer equal to SW B50WZ0001 Kem Kromik Universal Metal Primer Off White.
  - 2. Gloss: Two coats of alkyd enamel; equal to SW B54W00151 Industrial Urethane Alkyd Enamal Extra White.
- D. Paint MgE-OP-3A Galvanized Metals, Alkyd, 3 Coat:
  - 1. One coat galvanize primer Equal to SW B66W00310 Pro Industrial Pro Cryl Universal Primer Off White.
  - 2. Gloss: Two coats of alkyd enamel; Equal to SW B54W00151 Industial Urethane Alkyd Enamel Extra White.

## 2.04 PAINT SYSTEMS - INTERIOR

- A. Paint I-OP All Interior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including gypsum board.
  - 1. Flat: MPI gloss level 1; use this sheen at all locations.
  - 2. Eggshell: MPI gloss level 3; use this sheen at all locations.
  - 3. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
  - 4. Primer(s): As recommended by manufacturer of top coats.
- B. Paint I-OP-DF Dry Fall: Metals; exposed structure and overhead-mounted services in utilitarian spaces, including shop primed steel deck, structural steel, and metal fabrications.
  - 1. Top Coat: Latex Dry Fall; MPI #118, 155, 226.
  - 2. Flat: MPI gloss level 1; use this sheen at all locations.
- C. Interior Concrete Floors Indicated to be Sealed. Refer to finish scedule. Provide clear sealer equal to Sherwin Williams general polymers 3477 water emulsion primer/sealer. 2 coats, 2 to 4 mils wft each. Install per manufacturers recommendations.

- D. Paint I-TR -W Transparent Finish on Wood, Unless Otherwise Indicated: for Decorative Wood Louver at Vestibule
  - 1. Stain: Semi-Transparent Stain for Wood; MPI #90.
- E. Paint WI-OP-3L Wood, Opaque, Latex, 3 Coat:
  - 1. One coat of latex primer sealer equal to SW B51W00020 PrepRite ProBlock Int/Ext Latex Primer/Sealer White.
  - Semi-gloss: Two coats of latex enamel; SW B31W02651 ProMar 200 Zero VOC Interior Latex Semi-Gloss Extra White.
  - 3. Eggshell: Two coats of latex enamel; \_\_\_\_\_\_.
- F. Paint CI-OP-3L Concrete/Masonry, Opaque, Latex, 3 Coat:
  - 1. One coat of block filler equal to SW B25W00025 Preprite Block Filter White.
  - 2. Semi-gloss: Two coats of latex enamel; SW B31W02651 ProMar 200 Zero VOC Interior Latex Semi-Gloss Extra White.
- G. Paint MI-OP-3L Ferrous Metals, Unprimed, Latex, 3 Coat:
  - 1. One coat of latex primer equal to SW B66W00310 Pro Industrial Pro-Cryl Universal Primer Off White.
  - 2. Semi-gloss: Two coats of latex enamel; SW B31W00051 ProClassic WaterBorne Interior Acrylic Semi-Gloss Extra White.
- H. Paint MI-OP-2L Ferrous Metals, Primed, Latex, 2 Coat:
  - 1. Touch-up with latex primer.
  - 2. Semi-gloss: Two coats of latex enamel; SW B31W00051 ProClassic WaterBorne Interior Acrylic Semi-Gloss Extra White.
- I. Paint GI-OP-3L Gypsum Board/Plaster, Latex, 3 Coat:
  - 1. One coat of laytex primer sealer equal to SW B28W08200 ProMar 200 Interior Latex Primer White.
  - 2. Eggshell: Two coats of latex enamel; SW B20W2651 ProMar 200 Zero VOC Egshell Extra White.
  - 3. Flat: Two coats of latex enamel; SW B30W02651 ProMar 200 Zero VOC Interior Latex Flat Extra White.

#### J. Sealed Concrete Floor

1. Provide general polymers 3477 or approved equal, water based clear epoxy, fully breathable, three (3) coats 4 mils WFT each coat, 0 VOC, provide sumittal to include written letter from manufacturer approving installer, Install per manufacturer's instructions, ASTM 84/NFDA 255

## K. Dry Fall Paint:

- 1. Paint ME- OP- 2A Ferrous Metals, Primed, Laytex, 2 Coat (Dry Fall)
  - a. Gloss: Two coats of Acrylic Primer and Finish Coats: Equal to SW
     B66W00501 Pro Industrial Multi Surface Acrylic Gloss Extra White
- 2. Paint MgE-OP-3A Galvanized Metal Laytex, 2 Coat (Dry Fall)
  - a. Gloss: Two coats of Acrylic Primer and Finish Coats: Equal to SWB66W00501 - Pro Industrial Multi Surface Acrylic Gloss Extra White
- 3. Refer to A7.7-A7.11. Provide paint to match dry fall paint(s) above for all surfaces indicated. Provide paint system as recommende by paint manufacturer for materials/surfaces to be painted.

## 2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

## **PART 3 EXECUTION**

#### 3.01 EXAMINATION

- A. Commencement of paint operations indicates applicators acceptance of surfaces and conditions.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.

- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  - 1. Gypsum Wallboard: 12 percent.
  - 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
  - 3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

## 3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- G. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- I. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).
- J. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

- K. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
- L. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

## 3.03 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Sand wood and metal surfaces lightly between coats to achieve required finish.
- E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- F. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- H. Interior walls and surfaces scheduled to receive paintings or coatings shall extend paintings/coatings a minimum of 6 inches above all drop ceilings unless noted otherwise in the drawings.

#### 3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

#### 3.05 PROTECTION

- A. Protect finished coatings until completion of project.
- B. Touch-up damaged coatings after Final Acceptance.

## END OF SECTION 09 9000

#### SECTION 10 1101 - VISUAL DISPLAY BOARDS

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Markerboards
- B. Visual Display Boards
  - 1. Marker Boards

## 1.02 RELATED REQUIREMENTS

- A. Section 06 1000 Rough Carpentry: Blocking and supports.
- B. Section 09 2116 Gypsum Board Assemblies: Concealed supports in metal stud walls.

#### 1.03 REFERENCE STANDARDS

- A. ANSI A135.4 American National Standard for Basic Hardboard; 2012.
- B. ANSI A208.1 American National Standard for Particleboard; 2009.
- C. ASTM A424/A424M Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.
- D. ASTM C36/C36M Standard Specification for Gypsum Wallboard; 2001.
- E. ASTM C208 Standard Specification for Cellulosic Fiber Insulating Board; 2012.
- F. ASTM C1396/C1396M Standard Specification for Gypsum Board; 2014.
- G. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- H. ASTM F793/F793M Standard Classification of Wall Coverings by Use Characteristics; 2015.
- I. FS L-P-1040 Plastic Sheets and Strips (Polyvinyl Fluoride); Federal Specifications and Standards; Revision B, 1977.
- J. PS 1 Structural Plywood; 2009.
- K. Provide GreenGuard Indoor Air Quality Certified

### 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on markerboard.
- C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.
- D. Samples: Submit color charts for selection of color and texture of markerboard.
- E. Samples: Submit two samples 2 by 2 inch (50 by 50 mm) in size illustrating materials and finish, color and texture of markerboard.
- F. Test Reports: Show compliance to specified surface burning characteristics requirements.
- G. Manufacturer's printed installation instructions.
- H. Maintenance Data: Include data on regular cleaning, stain removal, and \_\_\_\_\_.

## 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

## 1.06 WARRANTY

- A. See Section 01 7700 Project Closeout, 01 3000 Submittals, and 01 7400 for additional warranty requirements.
- B. Provide five year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining. Warranty dated on Final Acceptance.

#### PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A.	Visual Display Boards:	
	1.	MooreCo, Inc;: www.moorecoinc.com.
	2.	Claridge Products and Equipment, Inc;: www.claridgeproducts.com/#sle.
	3.	Polyvision Corporation (Nelson Adams);: www.polyvision.com/#sle.
	4.	

#### 2.02 VISUAL DISPLAY BOARDS

- A. Markerboards: Porcelain enamel on steel, laminated to core.
  - 1. Steel Face Sheet Thickness: 24 gage, 0.0239 inch (0.61 mm).
  - 2. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
  - 3. Backing: Galvanized steel sheet, laminated to core.
  - 4. Height: 48 inches (1220 mm).
  - 5. Length: 6 feet (1830 mm), in one piece.
  - 6. Frame: Extruded aluminum, with concealed fasteners.
  - 7. Frame Finish: Anodized, natural.
  - 8. Accessories: Provide map rail and marker tray.
  - 9. Contractor to provide a total of four (4) Markerboards for installation. Final locations to be identified on site by Owner and Architect.
  - 10. Provide Blocking Location to be decided onsite with Owner and Architect.

# 2.03 ACCESSORIES

- A. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall (; 25 mm wide overall), full width of frame.
- B. Map Supports: Formed aluminum sliding hooks and roller brackets to fit map rail.
- C. Temporary Protective Cover: Sheet polyethylene, 8 mil (0.2 mm) thick.
- D. Cleaning Instruction Plate: Provide instructions for chalkboard cleaning on a metal plate fastened to perimeter frame near chalkrail.
- E. Chalk Tray: Aluminum, manufacturer's standard profile molded ends; concealed fasteners concealed fasteners, same finish as frame.
- F. Mounting Brackets: Concealed.

## PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Verify that field measurements are as indicated.

- B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.
- C. Verify flat wall surface for frameless adhesive-applied boards.

## 3.02 INSTALLATION

- A. Install boards in accordance with manufacturer's instructions.
- B. Install with top of chalk tray as directed by Owner's Representative above finished floor.
- C. Install with top of chalk tray as directed by owner's representative above finished floor.
- D. Secure units level and plumb.
- E. Butt Joints: Install with tight hairline joints.

#### 3.03 CLEANING

- A. Clean board surfaces in accordance with manufacturer's instructions.
- B. Cover with protective cover, taped to frame.
- C. Remove temporary protective cover at date of Final Acceptance.

## 3.04 SCHEDULE

A. As shown on drawings.

## **END OF SECTION 10 1101**

#### **SECTION 10 1400 - SIGNAGE**

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Room and door signs.
- B. Emergency evacuation maps.
- C. Building identification signs.

#### 1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. ICC A117.1 Accessible and Usable Buildings and Facilities; 2009.

## 1.03 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
  - 1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
  - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
  - 3. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- F. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 Product Requirements, for additional provisions.

# 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

## 1.05 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

## PART 2 PRODUCTS

# 2.01 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements. Requirements include, but are not limited to the following:
  - 1. Tactile copy must be all upper case and raised at least 1/32". Tactile characters must be san serif, not italic, not oblique, script or highly decorative.
  - 2. The strike width of the upper case "I" has to be 15% of the letter height or less. The character width of the uppercase "O" must be between 55% and 110% of the hieght of the corresponding uppercase "I".
  - 3. The copy height for tactile information must be between 5/8" and 2". If separate visual characters are provided, raised characters can be 1/2" and need not contrast with the background.
  - 4. The distance between characters on tactile copy must be a minimum of 1/8" and a maximum of 4 times the character stroke width. These distances are measured between the closest points of adjacent characters.

- 5. Spacing between lines of tactile copy needs to be a minimum of 135% and a maximum of 170% of the corresponding uppercase "I" height (Measured from baseline to baseline).
- 6. Braille must be Grade II and positioned directly below the corresponding raised characters. If text is multi-lined, BRaille is placed below the entire body of text and separated 3/8" from any other tactile characters and 3/8" minimum from raised borders and decorative elements.
- 7. Visual characters and symbols, and their background, are to have a non-glare finish. The color of raised characters must contrast as much as possible with their background to make sure signs are more legible for persons with low vision.
- 8. Pictograms, selected from International Standards, are to be located within a 6" vertical void and accompanying text descriptions are to be located directly below the pictogram.
- B. Provide signage that conforms to the requirements of all regulatory agencies holding jurisdiction.
- C. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
  - 1. Sign Type: Flat signs with engraved panel media as specified.
  - 2. Sign Height: As required to accomodate text, braille, windows, pictograms.
  - 3. Office Doors: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section for replaceable occupant name.
  - 4. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.
  - 5. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
  - 6. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.
- D. Emergency Evacuation Maps:
  - 1. Type and locations as directed by Owner and Architect.
  - 2. Provide clear acrylic holder to accomodate 8 1/2 inch x 11 inch sized insert.

3. Map content to be provided by Owner.

# E. Building Identification Signs:

- 1. Use individual metal letters.
- 2. Mount on outside walls or monument signs in location(s) indicated on the Drawings.
- 3. Finish: Colors as selected from manufacturer's standard color selection of not less than 10 colors.
- 4. Height: As indicated on on Drawings
- 5. Design: As indicated on Drawings.
- 6. Mounting: Concealed standoff type, stainless steel fasteners or as recommended b signage manufacturer.

## F. Interior Specialty Sign

- 1. Material: Plasma Cut, Brushed Aluminum
- 2. Submittals: Submit shop drawings showing materials, construction, detail, size, layout, mounting and anchoring details.
- 3. Mounting: Concealed standoff type, with 1/2" standoff from decorative wood louver.
- 4. Fasteners shall be concealed.
- 5. Thickness: Minimum thickness as indicated on the Drawings.
- 6. Graphic Design logo shall conform to the Alabama National Guard Logo as shown on the Drawings. Submit shop drawings for Architect and Owner's final approval.
- 7. Any colors, gloss, UV resistance and general appearance shall be unaffected by sun for a minimum of 10 years from installation.

#### 2.02 SIGN TYPES

- A. Flat Signs: Signage media without frame.
  - 1. Edges: Square.
  - 2. Corners: Square.
  - 3. Wall Mounting of One-Sided Signs: Tape adhesive.

- B. Color and Font: Unless otherwise indicated:
  - 1. Character Font: Helvetica, Arial, or other sans serif font.
  - 2. Character Case: Upper case only.
  - 3. Background Color: Contrasting color.
  - 4. Character Color: Contrasting color.

## 2.03 TACTILE SIGNAGE MEDIA

- A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
  - 1. Total Thickness: 1/16 inch (1.6 mm).

## 2.04 DIMENSIONAL LETTERS

- A. Metal Letters:
  - 1. Metal: Aluminum casting.
  - 2. Metal Thickness: 1/4 inch minimum (\_\_\_\_\_ mm).
  - 3. Letter Height: As indicated on the Drawings
  - 4. Street Address: Coordinate with the City of Huntsville, Alabama.
  - 5. Text and Typeface:
    - a. Character Font: Helvetica, Arial, or Sans Serif, unless instructed otherwise.
    - b. Character Case: Upper case only.
  - 6. Finish: Brushed, satin.
  - 7. Mounting: Standoff type. Epoxied concealed anchors into masonry.

## 2.05 ACCESSORIES

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Tape Adhesive: Double sided tape, permanent adhesive.

#### PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

## 3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs and mount at height in accordance with ADA Standards and ICC A117.1.
- D. Locate signs where indicated:
  - 1. Room and Door Signs: Locate on wall at latch side of door. Where a tactile sign is provided at double doors with two active leafs, the sign shall located to the right of the right hand door. 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. 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 open position.
  - 2. 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.
- E. Protect from damage until Final Acceptance; repair or replace damaged items.

## **END OF SECTION 10 1400**

# **SECTION 10 2113.19 - PLASTIC TOILET COMPARTMENTS**

## PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Toilet compartments.
- B. Urinal and vestibule screens.
- C. Urinal Privacy Screens:

# 1.02 RELATED REQUIREMENTS

- A. Section 05 1200 Structural Steel Framing: Concealed steel support members.
- B. Section 05 5000 Metal Fabrications: Coordination with overhead supports; steel beams above finished ceiling to secure Ceiling-Hung and floor-to-ceiling stiles.
- C. Section 06 1000 Rough Carpentry: Coordination with blocking in walls to secure panels, wall posts and stiles.
- D. Section 10 2800 Toilet, Bath, and Laundry Accessories.

## 1.03 REFERENCE STANDARDS

- A. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- B. NFPA 286 Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

## 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

## 1.05 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- C. Product Data: Provide data on panel construction, hardware, and accessories.
- D. Samples: Submit two samples of partition panels, 6 by 6 inch (\_\_\_by\_\_\_ mm) in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures.

# 1.06 QUALITY ASSURANCE

- A. Manufacturer: Provide products manufactured by a company with a minimum of 10 years successful experience manufacturing similar products.
- B. Single Source Requirements: To the greatest extent possible provide products from a single manufacturer.
- C. Accessibility Requirements: Comply with requirements applicable in the jurisdiction of the project, including but not limited to ADA and ICC/ANSI A117.1 requirements as applicable.

#### 1.07 WARRANTY

A. Manufacturer's Standard Warranty: Provide warranty for Solid polymer HDP"E Material: Against breakage, corrosion, and delamination for 25 years.

#### PART 2 PRODUCTS

## 2.01 MANUFACTURERS

- A. Substitutions: The Architect will consider products of comparable manufacturers as a substitution, pending the contractor's submission of adequate documentation of the substitution in accordance with procedures in Division 1 of the Project Manual. Documentation shall include a list of five similar projects of equivalent size where products have been installed for a minimum of two years, and manufacturer's certification that products are fabricated in the United States.
  - 1. Subject to compliance with the material performance requirements, solid plastic manufactured toilet partition systems or manufactured using the solid plastic materials stated below will be acceptable:
    - a. (basis of design) ASI Global Paritions; 900 Clary Connector; Eastanollee, GA 30438
    - b. Partition Systems International of South Carolina (PSISC); 825 Garland Street, Columbia, SC 29201.
    - c. hardrian; 7420 Clover Ave., Mentor, OH 44060.

#### 2.02 PLASTIC TOILET COMPARTMENTS

A. Solid Plastic Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance

with NFPA 286; floor-mounted unbraced.

- 1. Doors, Panels, Screens, and Pilasters: Single sheet solid, homogenous HDPE plastic material formed from waterproof, non-absorbent, high-density polyethylene resins; mark-resistant self-lubricating surface; edges finished smooth.
  - a. Material: Solid, homogenous HDPE; 1 inch (25 mm) thick.
  - b. Rating: Class "B" Fire Rated per ASTM E 84.
  - c. Material shall be NFPA 286 compliant.
  - d. Edges: 1/4" (6 mm) radius machined edges.
- B. Finish: Orange Peal textured homogenous color throughout material. Color as selected by Architect and Owner from manufacturer's standard colors.

## C. Doors:

- 1. Thickness: 1 inch (25 mm).
- 2. Width: 24 inch (610 mm).
- 3. Width for Handicapped Use: 36 inch (915 mm), out-swinging.
- 4. Height: 55 inch (1397 mm).

#### D. Panels:

- 1. Thickness: 1 inch (25 mm).
- 2. Height: 55 inch (1397 mm).

#### E. Pilasters:

- 1. Thickness: 1 inch (25 mm).
- 2. Width: As required to fit space; minimum 3 inch (76 mm).
- F. Urinal Screens: Without doors; to match compartments; mounted to wall with two solid full length polished stainless steel panel brackets.
  - 1. Width: 24 inches (610 mm).
  - 2. Height: 48 inches (1219 mm).

#### 2.03 PHENOLIC TOILET COMPARTMENTS

## 2.04 ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard design, institutional operating hardware and accessories.
  - 1. Material: Stainless Steel (Polished)
- B. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match hardware, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.
- C. Provide emergency access latch & hinges.

## 2.05 FABRICATION

- A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor conditions. Make provisions for setting and securing continuous head rail at top of each pilaster. Provide shoes at pilasters to conceal supports and leveling mechanism.
- B. Doors: Unless otherwise indicated, provide 24-inch- (610-mm-) wide in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide out-swinging doors with a minimum 32-inch- (813-mm-) wide clear opening for compartments indicated to be accessible to people with disabilities.
  - 1. Hinges: Manufacturer's standard (not self-closing type) that can be adjusted to hold doors open at any angle up to 90 degrees.
  - 2. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be accessible to people with disabilities.
  - 3. Coat Hook: Manufacturer's stainless steel combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.
  - 4. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with accessibility requirements of authorities having jurisdiction. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

- C. Pilaster Shoes: Formed ASTM A666 Type 304 stainless steel with No. 4 finish, 3 inch (76 mm) high, concealing floor fastenings. Pilaster shoes are anchored to the pilaster with No. 10 stainless steel, vandal-resistant screws.
- D. Head Rails: Extruded aluminum, anti-grip profile.
  - 1. Size: Manufacturer's standard size.
- E. Wall Brackets: Continuous type, polished stainless steel.
- F. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
- G. Hardware: 304 heavy duty stainless steel equal to Bobrick series 1092:
  - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
  - 2. Door Latch: Slide type with exterior emergency access feature.
  - 3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
  - 4. Coat hook with rubber bumper; one per compartment, mounted on door.

#### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

# 3.02 INSTALLATION

- A. A. Install products in strict compliance with manufacturer's written instructions and recommendations, including the following:
  - 1. Verify blocking and supports in walls and ceilings have been installed properly at points of attachment.
  - 2. Verify location does not interfere with door swings or use of fixtures.
  - 3. Use fasteners and anchors suitable for substrate and project conditions
  - 4. Install units rigid, straight, plumb, and level.
  - 5. Conceal evidence of drilling, cutting, and fitting to room finish.

6. Test for proper operation.

## 3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch (6 mm).
- B. Maximum Variation From Plumb: 1/8 inch (3 mm).

## 3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).
- B. Adjust hinges to position doors in partial opening position when unlatched. Return outswinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

## **END OF SECTION 10 2113.19**

## SECTION 10 2200 - MOVEABLE WALL SYSTEM

## **PART 1 - GENERAL SPECIFICATIONS**

#### 1.01 WORK INCLUDED

A. Operable wall system shall be furnished, installed and serviced by wall manufacturer's authorized distributor, in compliance with the architectural drawings and specifications contained herein.

## 1.02 RELATED WORK

- A. Structural Support: Structural support system required for suspending the operable wall shall be designed, installed and pre-punched by contractor, in accordance with ASTM E 557 and manufacturer's shop drawings.
- B. Insulation: Sound insulation and baffles for the plenum area above the track system, under the permanent floor, inside air ducts passing over or around the operable wall, and in permanent walls adjoining the operable wall system shall be by others, in accordance with ASTM E 557.
- C. Opening Preparation: Proper and complete preparation of the operable wall system opening shall be by contractor in accordance with ASTM E 557, and shall include floor leveling; plumbness of adjoining permanent walls; substrate and/or ceiling tile enclosures for the track system; and the painting and finishing of trim and other materials adjoining the head and jamb areas of the operable wall. Any permanent wall(s) receiving an adjustable or fixed wall jamb will require internal structural blocking in order to secure the jamb to the permanent wall.

## 1.03 SYSTEM DESCRIPTION

- A. The operable wall system shall consist of Hinged Pair Panels that are top supported by one (1) carrier. Featuring panels hinged together in evenly matched pairs (groups of two (2)), unless otherwise specified.
- B. The operable wall system shall consist of acoustically rated panels tested in accordance with ASTM E 90 and ASTM E 413 test procedures, and shall have achieved a STC rating as specified herein (see "Acoustical Performance" article listed under Part 2 Products).

## 1.04 QUALITY ASSURANCE

A. The operable wall shall have been tested in an independent acoustical testing laboratory in accordance with ASTM E 90 and ASTM E 413 test procedures.

- B. The operable wall panel construction and finish materials shall consist of Class A rated materials in accordance with ASTM E 84.
- C. The operable wall shall be installed by the manufacturer's authorized distributor in accordance with ASTM E 557.

### 1.05 REFERENCES

- A. ASTM E 90: Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions.
- B. ASTM E 413: Determination of Sound Transmission Class (STC).
- C. ASTM E 557: Architectural Application and Installation of Operable Partitions.
- D. ASTM E 84: Surface Burning Characteristics of Building Materials.
- E. ASTM A 653: Specification for General Requirements for Steel Sheet, Alloy-Coated (Galvannealed) by the Hot Dip Process.
- F. ASTM C 423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- G. CCC-W-408A-D: Federal Specification which applies to Vinyl Coated Wall Coverings.
- H. CFFA-W-101-B: Chemical Fabrics and Film Association Quality Standard for Vinyl Coated Fabric Wall Coverings.

### 1.06 SUBMITTALS

- A. Manufacturer shall provide written technical information and related detail drawings, which demonstrate that the products comply with contract documents for each type of operable partition specified.
- B. Manufacturer shall provide detailed engineering drawings featuring track plan, panel elevation, horizontal and vertical details and beam punching template as required.
- C. Manufacturer shall provide written test report of the independent acoustical testing laboratory certifying the attainment of the specified STC rating, upon request.
- D. Manufacturer shall provide written instructions specifying the proper operation and maintenance of the operable wall system.
- E. Manufacturer shall provide a color selector demonstrating the manufacturer's selections of the specified finish material. Samples shall consist of actual swatches of the specified finish material.

## 1.07 DELIVERY, STORAGE AND HANDLING

- A. Panels shall be individually wrapped in a protective plastic covering to keep panels clean during delivery, storage and handling.
- B. Panels shall be stored on edge and above the floor on cushioned blocking in a dry and ventilated area, protected from humidity and temperature extremes.

# 1.08 SEQUENCING / SCHEDULING

- A. Beam Punching: Manufacturer shall provide beam punching template drawing detailing the anchor locations for the suspended track system (as required for Drop Rod Mounting), as required for the fabrication and installation of structural overhead support by others.
- B. Track Installation: Scheduling of operable wall track installation shall occur after structural overhead support has been properly and completely fabricated and installed by others.
- C. Panel Installation: Operable wall panel installation shall occur after fixed wall substrate construction is properly and completely installed by others, as required to protect panels from ongoing adjacent construction.

### 1.09 WARRANTY

A. Manufacturer shall warrant each partition and its component parts to be free from defects in material and workmanship for a period of five (5) years from the date of final acceptance.

### PART 2 - PRODUCT SPECIFICATIONS

# 2.01 ACCEPTABLE MANUFACTURER

A. Operable walls shall be Series 2000, Model 2030 Hinged Pairs as manufactured by KWIK- WALL Company or Equal.

### 2.02 PANEL CONSTRUCTION

- A. Panel Dimensions: Standard panel dimension shall be a nominal 3" [76] thick.
- B. Panel Frame: Vertical steel frame members shall be minimum 18-guage galvanneal steel, horizontal top corss member shall be minimum 12-guage galvanneal steel, which meets or exceed ASTM A 653 requirements. Frame shall be all-welded construction with steel corner supports and cross bracing reinforcements. Panel frame shall be Class A rated fire retardant, non-combustible and non-corrosvie in accordance with ASTM E 84.

- C. Panel Skins: Panel skins shall be Class A rated in accordance with ASTM E 84. Panel skin material shall consist of:
  - 1. Standard Acoustical Substrate: consisting of structural acoustical substrate pressure laminated to both sides of the steel reinforced frame to form a rigid, unitized and structural panel.
- D. Panel Hinges: Panel hinges shall be:
  - 1. Architectural grade, full leave butt hinges. Hinges shall be attached to the steel frame of the panel and reinforced with a steel backer plate.
- E. Panel Weight: Maximum panel weight shall be 6.5 12.0 lb./ft.2 (32 59 kg/m2) depending on STC rating, size and options selected.

### 2.03 OPERATION

- A. Operation shall be Hinged Pairs, consiting of panels hinged together in groups of two (2), unless otherwise specified. Panels shall be top supported by one (1) carrier in each panel.
- B. Refer to drawings for additional requirements.

## 2.04 STACK ARRANGEMENTS

- A. Stack Type: Panel storage configuration shall be:
  - 1. Center Stack, consisting of panels stacked on center to the wall's installed position.
- B. Stack Quantity: Panels shall be stored at
  - 1. Standard One End: on one end of the wall run.

## 2.05 FINISHES

- 1. Finish Material Type: Panel finish material shall be Class A rated in accordance with ASTM E 84, consisting of:
  - a. Fabric, consiting of fade and tear resistant fabric that resists water-based stains weighing 13 oz. lin./yd (403 g. / lin/ m).
- 2. Finish Material Supplier: Finish material shall be:
  - a. Standard Factory Supplied: from manufacturer's standard selection of finish materials, as selected by Architect and Owner.
- 3. Finish Material Application: Finish material shall be (select):

a. Standard Factory Applied: by operable wall manufacturer.

## 2.06 PERIMETER TRIM AND SEALS

- A. Vertical Trim and Seals: Panels shall have vertical astragals containing flexible vinyl seals and incorporate reversible tongue-and-groove-type configurations for positive interlocking with adjacent panels. Vertical astragal type shall be:
  - 1. Standard Trimless Astragal: consisting of an aluminum extrusion with tongue-and-groove-type vertical astragals. Vertical trim shall not be permitted on the panel faces, resulting in a minimal groove appearance between adjacent panels.
- B. Horizontal Top Trim and Seals: Top seals shall consist of flexible vinyl sweep seals installed on both sides of the panel. The seals shall consist of a compressed bulb between two (2) fingers of vinyl. Top seal type shall be:
  - 1. Standard Fixed Top Seals: consisting of continuous-contact flexible vinyl, sealing against the bottom flange of the overhead track.
- C. Horizontal Bottom Trim and Seals: Bottom seals shall consist of multiple fingers of flexible vinyl for positive contact and sealing with various floor surfaces. Bottom seal type shall be:
  - 1. Standard Operable Bottom Seals: consisting of an edge-activated seal using a removable wrench as supplied by manufacturer. Bottom seals shall provide 2" [50.8] of nominal travel.
- D. Horizontal and Vertical Panel Trim: All exposed panel trim and hinges shall be of one (1) similar color:
  - 1. Color as selected by Architect and Owner from manufacturer's standard color selections.

## E. CLOSURE SYSTEMS

- 1. Initial Closure System: The lead panel (the first panel exiting the stack) shall form seal vertically against a rigid wall surface, as accomplished by a:
  - a. Standard Bulb Seal: consisting of continuous-contact, flexible vinyl bulb seals installed along the vertical edge of the lead panel for positive compression against a rigid wall surface.
- 2. Final Closure System: The final closure panel (the last panel exiting the stack) shall form a seal vertically against a rigid wall surface. The type of final closure panel shall be:

- a. Standard Expander Panel Closure: consisting of an expander mechanism with a nominal 5" [127] of travel, activated from the face of the panel using a removable wrench as supplied by manufacturer.
- b. The Expander Panel shall be equipped with an adjustable bottom seal (standard) and a flush pull handle.
- F. Pocket Door: Pocket door configuration shall be hinged to an adjustable jamb consisting of an aluminum extrusion which is permanently mounted to a structural wall surface and is field-adjustable to compensate for out-of-plumb conditions of the fixed wall. The adjustable jamb shall incorporate a tongue-and-groove-type vertical astragal for positive interlocking with a pocket door panel. To stabilize the pocket door(s) a surface mounted footbolt shall be furnished by the operable wall manufacturer and installed by others in the field.
- G. Bi-Fold Doors w/ Bulb Seal: consisting of a pair of panels hinged together and hinged to an adjustable jamb. The lead panel shall contain flexible vinyl bulb seals installed along the vertical edge of the lead panel for positive compression against a rigid wall surface. A roller support caster located at the bottom of one (1) panel shall be included to provide additional support for the pocket doors.

### 2.07 ACOUSTICAL PERFORMANCE

- A. Certification: The operable wall shall have been tested in an independent acoustical testing laboratory in accordance with ASTM E 90 and ASTM E 413 test procedures.
- B. STC Rating: The operable wall acoustical performance rating shall be based on:
  - 1. Standard Acoustical Substrate: with a standard rating of 49 STC.

## 2.08 PANEL ACCESSORIES

A. Pocket door and frame, furnished and installed by the operable wall manufacturer.

### 2.09 TRACK SYSTEMS

- A. Track Type: The operable wall track system shall be
  - 1. Standard Hinged Pairs Aluminum Track: extruded from structural aluminum alloy, which prohibits deterioration caused by rust or corrosion. The aluminum track shall have a durable anodized clear satin finish, which resists color fading and flaking. The track shall utilize grooves and interlocking steel pins for positive alignment of adjacent track sections. The track joints shall be reinforced overhead by a heavy-duty steel bracket made of hot-rolled, 3/8" [10] thick plate steel. Aluminum track shall include an integral nut slot to accept a hardened steel square

nut to facilitate attachment of each steel all-rod and splice brackets to the overhead structural support.

- B. Track Size: The track size shall be:
  - 1. Type 425 Multi-Directional Aluminum Track: certified to be capable of supporting up to 425 lb. (193 kg) of total live load weight per panel.

### 2.10 CARRIER SYSTEMS

- A. Carrier Type: Each Hinged Pair panel shall be top supported by one (1) carrier utilizing a 5/8" [16] diameter pendant bolt. The carr
  - 1. Type 425 Polymer Tire Carrier: consisting of four (4) permanently lubricated, precision ball bearing steel wheels with high strength polymer tires, as required for smooth and quiet operation.
- B. Carrier Size: The carrier size shall be:
  - 1. Type 425 Hinged Pairs Polymer Tire Carrier: certified to be capable of supporting up to 425 lb. (193 kg) of total live load weight per panel.

## 2.11 SUSPENSION SYSTEMS

- A. Mounting Systems: The track shall be supported by:
  - 1. Standard Drop Rod Mount: consisting of adjustable rods of grade 2, 3/8" [10] diameter threaded steel all-rod provided with 3/8" [10] serrated steel nuts.

## **PART 3 - EXECUTION**

## 3.01 INSPECTION

- A. Proper and complete preparation of the operable wall system opening shall be by others in accordance with the architectural drawings, manufacturers shop drawings and ASTM E 557. Any deviation of the actual opening from these specifications shall be called to the attention of the architect prior to the installation of the operable wall.
- B. Deficiencies in the operable wall opening shall be corrected by others prior to installation of the operable wall.

### 3.02 INSTALLATION

- A. The operable wall system shall be installed by manufacturer's authorized distributor.
- B. The operable wall shall be installed in accordance with manufacturer's written instructions, shop drawings and ASTM E 557 installation guidelines.

## 3.03 ADJUSTING AND CLEANING

A. The operable wall panels and track system shall be adjusted and cleaned in accordance with manufacturers written instructions.

## 3.04 PROTECTION

A. The operable wall panels shall be stored in the stacked (retracted) position prior to acceptance by the owner's representative.

## 3.05 DEMONSTRATION

A. The operable wall manufacturer's authorized distributor shall demonstrate proper operation and explain proper and necessary maintenance requirements of the operable wall system to the owner's representative.

# **END OF SECTION 10 2200**

### **SECTION 10 2213 - WIRE MESH PARTITIONS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

- A. Wire mesh systems for walls and ceilings.
- B. Fencing system complete with all hardware, infill mesh, union extrusions, posts, rails, gates, and accessories necessary for a complete and aesthetically balanced installation.
- C. Swinging gates and related hardware.

## 1.02 REFERENCE STANDARDS

- A. Note: It is the responsibility of the fence material supplier to confirm the use of the current "active standard" for all referenced standards in this document.
  - 1. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2014.
  - 2. ASTM A510/A510M Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel; 2013.
  - 3. ASTM A1008/A1008M Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.

### 1.03 SUBMITTALS

- A. Product Data: Provide data for screen materials, finishes. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for wire mesh items.
- B. Shop Drawings: Indicate plan and vertical dimensions, elevations, component details; head, jamb, and sill details; location of hardware. Provide component details, anchorage, and type and location of fasteners.
  - 1. Show field measurements on shop drawings.
  - 2. Include clearances required for operation of doors.

# 1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain wire mesh items from single source from single manufacturer.

- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."
  - 2. AWS D1.3, "Structural Welding Code Sheet Steel."

## 1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver wire mesh items to provide protection during transit and Project-site storage. Use vented plastic.

## 1.06 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with wire mesh units by field measurements before fabrication.

## PART 2 PRODUCTS

## 2.01 MANUFACTURERS

- A. Wire Mesh Partitions:
  - 1. Acorn Wire and Iron Works, Inc; \_\_\_\_: www.acornwire.com/#sle.
  - 2. American Woven Wire Corporation.
  - 3. Jesco Industries, Inc.
  - 4. Kenco Wire and Iron Products Inc.
  - 5. Standard Wire & Steel Works.
  - 6. WireCrafters, www.wirecrafters.com
  - 7. Substitutions: See Section 01 6000 Product Requirements.

## 2.02 WIRE MESH PARTITIONS

A. Wire Mesh Partitions: Factory-fabricated modular assemblies of panels, doors, anchors, hardware, and accessories as required to provide a complete system.

## 2.03 DESIGN CRITERIA

A. Design partition system to provide for movement of components without damage, undue stress on fasteners or other detrimental effects, when subject to design loads.

#### 2.04 WIRE MESH PARTITIONS

- A. Wire Mesh Partitions: Facory-assembled modular sized panels stacked between post uprights, complete with all components, accessories, hardware, and fasteners; interchangeable units that allow expansion without waste of components.
  - 1. Style: Full mesh.
  - 2. Provide fixed sections unless otherwise indicated.
  - 3. Post Spacing: As required to suit dimensions, using manufacturer's standard panel widths.
  - 4. Provide special panels of same construction as adjacent panels to achieve horizontal partition dimensions indicated.
  - 5. Panel frames bolted together and to posts.
  - 6. Height: varies, extend to underside of structure above.
  - 7. Toe Space 3-1/4 inch high open space below bottom panel.
  - 8. Finish: Electrostatic sprayed enamel, in manufacturer's standard color.
  - 9. Field bracing furnished by erector.
- B. Post: Square 2 by 2 inch 14 gauge steel tube.
  - 1. Factory drilled holes for attacheing panels.
  - 2. Welded-on base plate, 2 by 7 by 1/4 inch, with factory drilled holes for floor anchors.
  - 3. Corner Posts: Same as in-line posts.
  - 4. Provide appropriate hardware for attaching panels to posts and posts to floor.
- C. Wire Mesh Panels: Steel angle frames with wire mesh securely welded in place; frame joints coped at corner and securely welded; factory drilled holes for fasteners.
  - 1. Wire Mesh: 10 gauge, 0.135 inch steel wire woven into 1-1/2" diamond mesh.
  - 2. Frame: 1-1/4 by 1-1/4 by 1/8 inch hot rolled steel angle.
  - 3. Vertical Panel Stiffeners: 1/4 by 3/4 inch steel bar securely welded to frame behind mesh on panels 4 feet or wider.
  - 4. Panels shall extend continuous from floor to roof deck.

- D. Door Sections: Matching wire mesh panels.
  - 1. Frame: 1-1/4 by 1-1/4 by 1/8 inch hot rolled steel angle.
  - 2. Stiffeners: Two horizontal and one vertical stiffener of 1/4 by 3/4 inch flat hot rolled steel bar.
  - 3. Hinged Door and Panel in Open Position
    - a. Door Width: 48 inches.
    - b. Door Opening Height: 96 inches.
    - c. Door Hinges: Manufacturer's standard hinges, structurally capable of supporting gate leaf and allow opening and closing without binding. Non-liftoff type hinge design shall permit gate to swing 180 deg. Hinge pints shall be non-removable.
    - d. Door Latches: Each door shall have two lock hasps on a metal plate welded to the door and corresponding door frame. Locate one hasp at the third point from the bottom of the door and the other hasp at the third point from the top of the door. Lock to be provided by Owner.
    - e. Finish: Electrostatic sprayed enamel, in manufacturer's standard color.

## 2.05 MATERIALS

- A. Steel Wire: ASTM A 510.
- B. Steel Plates, Channels, Angles, and Bars: ASTM A 36/A 36M.
- C. Cold-Rolled Steel Seet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- D. Panel-to-Panel Fasteners: Manufacturer's standard steel bolts, nuts, and washers.
- E. Postinstalled Expansion Anchors: With capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
  - 1. Carbon Steel: Zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition (mild).
  - 2. For Postinstalled Anchors in Concrete: Capability to sustain without failure a load equal to four times the loads imposed.

### 2.06 COMPONENTS

## 2.07 FABRICATION

- A. General: Fabricate wire mesh items from components of sizes not less than those indicated. Use larger-sized components as recommended by wire mesh item manufacturer. As required for complete installation, provide bolts, hardware, and accessories with manufacturer's standard finishes.
  - 1. Fabricate wire mesh items to be readily disassembled.
  - 2. Welding: Weld corner joints of framing and grind smooth, leaving no evidence of joint.
- B. Wire Mesh Partitions: Fabricate wire mesh partitions with cutouts for pipes, ducts, beams, and other items indicated. Finish edges of coutouts to provide a neat, protective edge.
  - 1. Mesh: Securely clinch mesh to framing.
  - 2. Framing: Fabricate framing with mortise and tenon corner construction.
    - a. Provide horizontal stiffeners as indicated or, if not indicated, as required by panel height and as recommend by wire mesh partition manufacturer. Weld horizontal stiffeners to vertical framing.
    - b. Fabricate partition and door framing with slotted holes for connecting adjacent panels.
  - 3. Fabricate wire mesh partitions with 3 inches of clear space betwen finished floor and bottom horizontal framing.
  - 4. Doors: Align bottom of door with bottom of adjacent panels.
    - a. For doors that do not extend full height of partiton, provide transom over door, fabricated from same mesh and framing as partion panels.
  - 5. Hardware Preparation: Mortise, reinforce, drill, and tap doors and framing as required to install hardware.

# 2.08 GENERAL FINISHE REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Project mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

## 2.09 STEEL AND IRON FINISHES

- A. Preparation for Shop Priming: Prepare uncatoed ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:
  - 1. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
- B. Baked-Enamel or Power-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, baked-on finish, suitable for use indicated, consisitong of prime coat and themosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine floors for suitable conditions where wire mesh items will be insatlled.
- C. Examine walls to which wire mesh itmes will be attached for properly located blocking, grounds, and other solid backing for attachement of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 WIRE MESH PARTIONS ERECTION

- A. Anchor wire emsh partitions to floor with 3/8-icnh-diameter, postinstalled expansion anchors at 12 inches o.c. through floor shoes located at each post and corner. Adjust wire mesh partition posts in floor shoes to achieve level and plumb installation.
- B. Secure top capping bars to top framing channels with 1/4-inch-diameter "U" bolts spaced not more than 28 inches o.c.
- C. Provide line posts at locations indicated or, if not indicated, as follows:
  - 1. For partitions that are 7 to 9 feet high, spaced at 15 to 20 feet o.c.
  - 2. For partitions that are 10 to 12 feet high, located between every other panel.

- 3. For partitions that are more than 12 feet high, located between each panel.
- D. Where standared-width wire mesh partition panels do not fill entire length of run, provide adjustable filler panels to fill openings.
- E. Install doors complete with door hardware.

## 3.03 ADJUSTING AND CLEANING

- A. Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Remove and replace defective work including doors and framing that are warped, bowed, or otherwise unacceptable.
- C. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- D. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in and Section 09 9000.

## **END OF SECTION 10 2213**

This page intentionally left blank

## SECTION 10 2800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Accessories for toilet rooms and showers.
- C. Grab bars.

# 1.02 RELATED REQUIREMENTS

- A. Section 09 3000 Tiling: Ceramic washroom accessories.
- B. Section 10 2113.19 Plastic Toilet Compartments.

### 1.03 REFERENCE STANDARDS

- A. ASTM A269/A269M Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015.
- B. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- D. ASTM B456 Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011.
- E. ASTM C1036 Standard Specification for Flat Glass; 2011.
- F. ASTM C1503 Standard Specification for Silvered Flat Glass Mirror; 2008 (Reapproved 2013).
- G. GSA CID A-A-3002 Mirrors, Glass; U.S. General Services Administration; 1996.

# 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

### 1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Products listed are made by Bobrick or Georgia Pacific.
- B. Commercial Toilet, Shower, and Bath Accessories:

1.	<b>AJW</b>	Architectural	Products;	:	www.a	iw.com/#sle.

- 2. American Specialties, Inc; \_\_\_\_: www.americanspecialties.com/#sle.
- 3. Bradley Corporation; \_\_\_\_\_: www.bradleycorp.com/#sle.
- 4. Georgia-Pacific Professional; \_\_\_\_\_: www.blue-connect.com/#sle.
- 5. Substitutions: Section 01 6000 Product Requirements.

## 2.02 MATERIALS

- A. Accessories General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
  - 1. Grind welded joints smooth.
  - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide 2 keys for each accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- F. Mirror Glass: 1/4" thick Float glass, ASTM C 1036 Type I, Class 1, Quality Q2, with silvering, copper coating, and suitable protective organic coating to copper backing in accordance with GSA CID A-A-3002.
- G. Adhesive: Two component epoxy type, waterproof.

- H. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

### 2.03 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.

### 2.04 Commercial Toilet Accessories

- A. 18" Grab Bar: Equal to B-5806-18 concealed fasteners.
- B. 36" Grab Bar: Equal to B-5806-36 concealed fasteners.
- C. 48" Grab Bar: Equal to B-5806-48 concealed fasteners.
- D. Toilet Paper Holder, Equal to Taymor Toilet Paper Holder, Triple Post, Silver, Item #23MF55.
- E. Mirror 18"w X 36"h equal to Bobrick B-165 1836 Stainless Steel Channel framed Mirror.
- F. Utility shelf. Equal to B-239x34 one per each Janitors Closet.
- G. Stainless Steel Shelf 18" long x 5" wide, 18-guage, type 304 stainless steel, satin finish, equal to Bobrick B-295 x 18.
- H. Sanitary Napkin Disposal (surface mounted) Equal to B-270
- I. Double Robe Hook Equal to B-672
- J. Surface mounted Universal Hardwound ManualPaper Towel Dispenser Equal to Georgia Pacific Item GP 54338.
- K. Omit.
- L. Omit
- M. Shower Curtain Rod (Heavy Duty) Equal to B-6047 x 48 mount per manufacturer's recommended height and mounting methods.
- N. Where toilet accessories are located in CMU walls, comply with manufacturer's recommendations for mounting. Coordinate and provide filled CMU cells where applicable. Mount and locate per ADA. Coordinate with all other trades.

## PART 3 EXECUTION

# 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.

## 3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

## 3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
- D. Mounting Heights and Locations: As required by accessibility regulations
- E. Where installation of accessories is in metal stud walls provide concealed wood blocking in wall cavity prior to installation coordinate with rough carpentry.

## **END OF SECTION 10 2800**

## **SECTION 10 4400 - FIRE PROTECTION SPECIALTIES**

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Fire extinguisher cabinets.
- B. Accessories.

# 1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

# 1.03 REFERENCE STANDARDS

## 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide color and finish, anchorage details, and installation instructions.
- C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

## PART 2 PRODUCTS

# 2.01 MANUFACTURERS

A.	Fire	re Extinguisher Cabinets and Accessories:			
	1.	Ansul, a Tyco Business;: www.ansul.com/#sle.			
	2.	JL Industries, Inc;: www.jlindustries.com.			
	3.	Kidde, a unit of United Technologies Corp;: www.kidde.com/#sle.			
	4.	Larsen's Manufacturing Co;: www.larsensmfg.com/#sle.			
	5.	Nystrom, Inc;: www.nystrom.com/#sle.			
	6.	Potter-Roemer; : www.potterroemer.com/#sle.			

- 7. Pyro-Chem, a Tyco Business; \_\_\_\_\_: www.pyrochem.com/#sle.
- 8. Strike First Corporation of America; Equal to; EL-Elite Architectural Series Fire Extinguisher Cabinet, Non-Fire Rated: Surface Mounted 108-EL-S-Full Glass Door Style; Decal "Fire Ext." Small Vertical Font Red; Standard Chrome Handles and Clear Acrylic Glazing; www.strikefirstusa.com.
- 9. Substitutions: See Section 01 6000 Product Requirements.

## 2.02 FIRE EXTINGUISHER CABINETS

- A. Cabinet Construction: Non-fire rated.
  - 1. Formed primed steel sheet; 0.036 inch (0.9 mm) thick base metal.
- B. Cabinet Configuration: Semi-recessed type.
- C. Door: 0.036 inch (0.9 mm) metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinge.
- D. Door Glazing: Float glass, clear, 1/8 inch (3 mm) thick, and set in resilient channel glazing gasket.
- E. Finish of Cabinet Exterior Trim and Door: No. 4 Brushed stainless steel.

## 2.03 ACCESSORIES

A. Extinguisher Brackets: Formed steel, chrome-plated.

### PART 3 EXECUTION

## 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

# 3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings. *Mounting height shall be in accordance with the Drawings*.
- C. Secure rigidly in place.
- D. Position cabinet signage at above cabinet.

E. Final location of cabinet to be selected on site by Owner and Architect.

**END OF SECTION 10 4400** 

This page intentionally left blank

### **SECTION 10 7200 - ALUMINUM CANOPIES**

## **PART 1 - GENERAL**

### 1.01 Related Documents

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, shall apply to work specified in this section.

# 1.02 General Description of Work

A. Work in this section shall include design, fabrication and installation of complete welded, extruded aluminum canopy system. All work shall be in complete accordance with the drawings and this specification.

# 1.03 References

- A. Aluminum Design Manual 2000, Specifications & Guidelines for Aluminum Structures.
- B. ASCE 7, Minimum Design Loads for Buildings and Other Structures.
- C. American Architectural Manufacturers Association (AAMA)
- D. American Society for Testing and Materials (ASTM)

### 1.04 Related Sections

- A. Concrete Work Section 03 3000
- B. Masonry Work Section 04 2000
- C. Metal Fabrications- Section 05 5000
- D. Sheet Metal and Trim Section 07 6200
- E. Joint Sealants Section 07 9005

### 1.05 Submittals

- A. Product Data: Submit manufacturer's product information, specifications and installation instructions for components and accessories.
- B. Shop Drawings: Submit complete erection drawings showing attachment system, column and gutter beam framing, transverse cross sections, covering and trim details, and option installation details to clearly indicate proper assembly of components.

- Detailed shop drawings shall be submitted, sealed by a State Registered Structural Engineer registered in the state in which the work is being performed.
- C. Certification: Submit written Certification prepared and signed by a State Registered Structural Engineer verifying that framing design will safely resist wind uplift as computed by ANSI A58.1, IV=150, Exposure C, as well as meet indicated loading requirements of all applicable building codes for project location, latest edition as referenced in State Requirements for Educational Facilities 1999 and wind loading requirements of ANSI/ASCE 7-98, live and dead loads and other load requirements.
- D. Calculations: Submit complete structural design calculation sealed by State Registered Structural Engieer registered in the state in which the work is being performed.
- E. Design and engineering of footers and attachment surfaces are not covered in this specification and scope of work.

# 1.06 Quality Assurance

- A. Codes and standards: Comply with provisions of the following except as otherwise indicated: all applicable building codes for location project, 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 Qualifications: 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.
- E. Coordination: Coordinate work of this section with work of other sections which interface with covered walkway system (sidewalk, curbs, building fascias, etc.).

## 1.07 Warranty

A. Provide manufactures standard ten (10) year warranty that shall include, but not limited to, coverage for structural, water tightness and finish beginning the day of Owner's Final Acceptance.

### **PART 2 - PRODUCT**

## 2.01 Manufacturers

- A. Contract documents are based on products manufactured by:
  - 1. Tennessee Valley Metals, Inc., or equal.

190 Industrial Park Road.

Oneonta, AL 35121

205.274.9500

fax 205.274.9501

800.551.2579

sales@tvmetals.com

www.tvmetals.com

- 2. Equal Manufacturers:
  - a. Peachtree Protective Covers
    - 1) 1477 Rosedale Drive, Hiram Georgia 30141
    - 2) 800.341.3325
    - 3) ppc@peachtreecovers.com
  - b. Gulf South Metals
    - 1) 615 Wynn Road, Summerdale, AL 36580
    - 2) 251.989.6443
    - 3) mikesparks@gulfsouthmetals.com
- B. Interested manufacturers will be considered for per Division 01 Requirements.

# 2.02 Materials

- A. Aluminum Extrusions: All sections shall be extruded aluminum 6063 alloy, heat treated to T-6 temper. with Kynar Finish
- B. Sheet Metal Flashing and Trim: .032 Aluminum with Kynar Finish, AAMA 6005.2, two coats.

- C. Finishes: Standard or custom color as selected by Owner and Architect.
  - 1. For flouroplymer (Kynar) finish, specify AAMA 605.2, two coats
- D. Submit color samples for Owner and Architect's approval. Do not place order with manufacturer until receipt of written authorization from Owner and Architect approving color and design.
- E. Canopies Equal to Walkway Canopies by TVM Metals.

# 2.03 COMPONENTS, all with Kynar or equal finish

- A. Columns: Columns shall be radius cornered tubular extrusion as sized by manufacturer with cutout and internal diverter for drainage where indicated. Circular downspout opening in column is not acceptable.
- B. Beams: Beams shall be open-top tubular extrusion of size and shape shown on drawings, top edges thickened for strength and designed to receive deck members in self-flashing manner. Structural ties shall be installed in tops of all beams.
- C. Deck: Deck shall be extruded self-flashing sections interlocking into a composite unit.
- D. Fascia: Fascia shall be manufacturer's standard shape. Size as indicated on drawings.
- E. Flashing: Flashing shall be .032 aluminum (min.). All thru-wall flashing is completed by others.

#### 2.04 Fabrication

- A. Drainage: Water shall drain internally from deck to beams to columns, for discharge out to rain diverters at or below ground level as indicated on architectural drawings.
- B. Deck Construction: Deck shall be manufactured of extruded modules that interlock in a self-flashing manner. Interlocking joints shall be positively fastened at 18" O.C. creating a monolithic structural unit capable of developing the full strength of the sections. The fastenings must have minimum shear strength of 350 pounds each. Deck shall be assembled with sufficient camber to offset dead load deflection.

## **PART 3 - EXECUTION**

# 3.01 Preparation

A. Erection shall be performed after all concrete, masonry, and roofing work in the vicinity is complete and cleaned.

## 3.02 Installation

- A. Column Sleeves: Column sleeves (Styrofoam blockouts) or anchor bolts (if required) shall be furnished by canopy manufacturer and installed by the General Contractor.
- B. Erection: Protective cover shall be erected true to line, level and plumb.

# 3.03 Cleaning

A. All protective cover components shall be cleaned promptly after installation.

# 3.04 Protection

A. Extreme care shall be taken to protect materials during and after installation.

# END OF SECTION 10 7200

This page intentionally left blank

### SECTION 10 7202 - ROD SUPPORTED EXTRUDED ALUMINUM CANOPIES

## **PART 1 - GENERAL**

### 1.01 Related Documents

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, shall apply to work specified in this section.

# 1.02 General Description of Work

A. Work in this section shall include design, fabrication and installation of complete rod supported extruded aluminum canopy system. All work shall be in complete accordance with the drawings and this specification.

# 1.03 References

- A. Aluminum Design Manual 2000, Specifications & Guidelines for Aluminum Structures.
- B. ASCE 7, Minimum Design Loads for Buildings and Other Structures.
- C. American Architectural Manufacturers Association (AAMA)
- D. American Society for Testing and Materials (ASTM)

### 1.04 Related Sections

- A. Concrete Work Section 03 3000
- B. Masonry Work Section 04 2000
- C. Metal Fabrications- Section 05 5000
- D. Sheet Metal and Trim Section 07 6200
- E. Joint Sealants Section 07 9005

### 1.05 Submittals

- A. Product Data: Submit manufacturer's product information, specifications and installation instructions for components and accessories.
- B. Shop Drawings: Submit complete erection drawings showing attachment system, column and gutter beam framing, transverse cross sections, covering and trim details, and option installation details to clearly indicate proper assembly of components.

- Detailed shop drawings shall be submitted, sealed by a State Registered Structural Engineer registered in the state in which the work is being performed.
- C. Certification: Submit written Certification prepared and signed by a State Registered Structural Engineer verifying that framing design will safely resist wind uplift as computed by ANSI A58.1, IV=150, Exposure C, as well as meet indicated loading requirements of all applicable building codes for project location, latest edition as referenced in State Requirements for Educational Facilities 1999 and wind loading requirements of ANSI/ASCE 7-98, live and dead loads and other load requirements.
- D. Calculations: Submit complete structural design calculation sealed by State Registered Strutural Engineers registered in the state in which the work is being performed.
- E. Design and engineering of footers and attachment surfaces are not covered in this specification and scope of work.

# 1.06 Quality Assurance

- A. Codes and standards: Comply with provisions of the following except as otherwise indicated: all applicable building codes for location project, 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 Qualifications: 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.
- E. Coordination: Coordinate work of this section with work of other sections which interface with covered walkway system (sidewalk, curbs, building fascias, etc.).

# 1.07 Warranty

A. Provide manufactures standard ten (10) year warranty that shall include, but not limited to, coverage for structural, water tightness and finish beginning the day of Owner's Final Acceptance.

## **PART 2 - PRODUCT**

## 2.01 Manufacturers

- A. Contract documents are based on products manufactured by:
  - 1. Tennessee Valley Metals, Inc., or equal.

190 Industrial Park Road.

Oneonta, AL 35121

205.274.9500

fax 205.274.9501

800.551.2579

sales@tvmetals.com

www.tvmetals.com

- 2. Equal Manufacturers:
  - a. Peachtree Protective Covers
    - 1) 1477 Rosedale Drive, Hiram Georgia 30141
    - 2) 800.341.3325
    - 3) ppc@peachtreecovers.com
  - b. Gulf South Metals
    - 1) 615 Wynn Road, Summerdale, AL 36580
    - 2) 251.989.6443
    - 3) mikesparks@gulfsouthmetals.com
- B. Interested manufacturers will be considered for per Division 01 Requirements.

# 2.02 Materials

- A. Aluminum Extrusions: All sections shall be extruded aluminum 6063 alloy, heat treated to T-6 temper. with Kynar Finish
- B. Sheet Metal Flashing and Trim: .032 Aluminum with Kynar Finish

- C. Finishes: Standard or custom color as selected ny architect
  - 1. Flouroplymer (Kynar) finish, specify AAMA 605.2, two coats
- D. Submit color samples for Owner and Architect's approval. Do not place order with manufacturer until receipt of written authorization from Owner and Architect approving color and design.
- E. Canopies Equal to Rod Supported Extruded Aluminum Canopy Series 2100 Flat by TVM Metals.

# 2.03 COMPONENTS, all with Kynar or equal finish

- A. Support rods: Rods shall be 2" tubular shapes as per manufactuer's standard. (painted to match canopy).
- B. Deck: Deck shall be extruded self-flashing sections interlocking into a composite unit.
- C. Fascia: Fascia shall be manufacturer's standard shape. Size as indicated on drawings.
- D. Flashing: Flashing shall be .032 aluminum (min.). All thru-wall flashing is completed by others.
- E. Scuppers: Scupper plats shall be used to drain water from the canopy fasica.
- F. Fasteners: All exposed fasteners shall be stainless steel.

#### 2.04 Fabrication

- A. Drainage: Water shall drain internally from deck to beams to columns, for discharge out to rain diverters at or below ground level as indicated on architectural drawings.
- B. Deck Construction: Deck shall be manufactured of extruded modules that interlock in a self-flashing manner. Interlocking joints shall be positively fastened at 18" O.C. creating a monolithic structural unit capable of developing the full strength of the sections. The fastenings must have minimum shear strength of 350 pounds each. Deck shall be assembled with sufficient camber to offset dead load deflection.

## **PART 3 - EXECUTION**

# 3.01 Preparation

A. Erection shall be performed after all concrete, masonry, and roofing work in the vicinity is complete and cleaned.

# 3.02 Installation

A. Protective cover shall be erected true to line with adequate slope for drainage.

Adequate framing members and/or blocking shall be provided in the wall structure (by others) to safely support the canopy.

# 3.03 Cleaning

A. All protective cover components shall be cleaned promptly after installation.

# 3.04 Protection

A. Extreme care shall be taken to protect materials during and after installation.

# END OF SECTION 10 7202

This page intentionally left blank

### **SECTION 10 7500 - FLAGPOLES**

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

A. Aluminum Flagpoles.

# 1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete base and foundation construction.

### 1.03 REFERENCE STANDARDS

- A. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- B. ASTM B241/B241M Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2016.
- C. NAAMM FP 1001 Guide Specifications for Design Loads of Metal Flagpoles; 2007.

# 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pole, accessories, and configurations.
- C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.

# 1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed the State in which the Project is located.

# 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
- B. Protect flagpole and accessories from damage or moisture.

#### PART 2 PRODUCTS

### 2.01 FLAGPOLES

- A. Flagpoles: Designed in accordance with NAAMM FP 1001 Basis of design: Concord American Flagpole (Independence Series) or equal. (Two Flags on one Hylard)
  - 1. Material: Aluminum.
  - 2. Design: Cone tapered.
  - 3. Mounting: Steel Base Plate w/ Anchor Bolts.
  - 4. Outside Butt Diameter: 8 inches (203.2 mm).
  - 5. Nominal Wall Thickness: .188 inches (4.7752 mm).
  - 6. Nominal Height: Forty (40'-0") ft (12.192 m); measured from top of base.
  - 7. Halyard: Interior type.
  - 8. Flagpole Rigging System: Stainless Steel M-winch with removeable handle. Flush access door with hinge and cylinder lock.

# B. Performance Requirements:

1. Flagpole With Flag Flying: Resistant without permanent deformation to 120 miles/hr (193.121 km/hr) wind velocity; non-resonant, safety design factor of 2.5.

### 2.02 POLE MATERIALS

A. Aluminum: ASTM B241/B241M, 6063 alloy, T6 temper.

# 2.03 ACCESSORIES

- A. Finial Ball: Gold Anodized Aluminum, 6 inch (150 mm) diameter.
- B. Internal Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
- C. Halyard: 3/8 inch (9 mm) diameter stainless steel aircraft cable.
- D. Beaded Retainer Ring: Solid Neoprene ball retaining loop with Stainless Steel cable core, with Neoprene coated counterweight

#### 2.04 OPERATORS

A. Hand Crank: Removable <> type.

### 2.05 MOUNTING COMPONENTS

A. Foundation Mount: Cast aluminum shoe base. Coordinate anchorage requirements with concrete pandscape wall.

#### 2.06 FINISHING

- A. Metal Surfaces in Contact With Concrete: Asphaltic paint.
- B. Aluminum: Mill finish.
- C. Finial: Spun finish.

### PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

#### 3.02 PREPARATION

A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

# 3.03 INSTALLATION

A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.

# 3.04 TOLERANCES

A. Maximum Variation From Plumb: 1 inch (25 mm).

#### 3.05 ADJUSTING

A. Adjust operating devices so that halvard and flag function smoothly.

### 3.06 SCHEDULES

A. Main Entry: One 40 (12.192 m) feet pole with two (2) flags on one cable.

# **END OF SECTION 10 7500**

This page intentionally left blank

# **SECTION 11 4000 - FOODSERVICE EQUIPMENT**

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Drawings and specifications are to be considered as complementary each to the other. What is called for by one shall be as binding as if called for by both. The plans indicate the location of the equipment. Slight changes due to the varying dimensions of equipment and wall construction shall be permitted with approval by the Architect.
- C. Plans and specifications are based upon products and/or systems of first named manufacturer. Any modifications and/or substitutions, other than the first named, that require changes in plumbing, mechanical, or electrical shall be coordinated and paid for by the Food Service Equipment Contractor (hereinafter referred to as the F.S.E.C.).

#### 1.02 SUMMARY

- A. This Section includes food service equipment indicated on Drawings and schedules. Provide all equipment, labor, material and services necessary and reasonably incidental to furnishing and installing all equipment herein specified except where such items are noted, scheduled, or specified to be furnished and/or installed by others. Deliver all equipment of this section to its location on site with all transportation charges prepaid.
- B. Owner-Furnished Equipment: Where indicated, Owner will furnish equipment items. Special consideration should be applied in the execution of this work to assure that these items are protected, and stored in a timely manner. Such equipment is to be cleaned, adjusted, calibrated, and placed in the proper location as shown on plan.
  - 1. Contractor shall install all Owner-Furnished Equipment as indiciated on the Drawings and in the Equipment Schedules.
- C. Contractor shall be responsible for seeing that the equipment can be entered through openings before doors and walls are finished.

# 1.03 RELATED REQUIREMENTS

- A. Division 22 000 / 23 000 Mechanical / HVAC
  - 1. Provide all gas, water lines, drains, and other necessary work including final connections to equipment.

- 2. Provide all ducts, to exhaust and supply fans to those hood(s) specified in this Section of the Contract Documents.
- 3. Provide all faucets, special switches, valves, traps, labor and materials to make final connections to equipment unless specified in this Section

#### B. Division 26 000 - Electrical

1. Provide all electrical utility lines, disconnect switches and other work including final connections to equipment.

# 1.04 REFERENCE STANDARDS

- A. NFPA 17, "Dry Chemical Extinguishing Systems."
- B. NFPA 17A, "Wet Chemical Extinguishing Systems."
- C. NFPA 54, "National Fuel Gas Code."
- D. NFPA 70 National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2017.

# 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: The F.S.E.C. shall be a properly licensed and recognized distributor for the category of items on which he/she bids. The F.S.E.C. must be an established firm which has Food Service Equipment as it's principal business, which has been established for at least 5 years prior to the bid date and maintained a show room and a reasonable inventory, which has a full time manager who has experience in contract work as pertaining to Food Service Equipment. The supplier must have demonstrated willingness to coordinate field problems and follow-up service during the warranty period. The supplier must have a reputation for supplying quality material. The supplier shall be solely responsible for ALL EQUIPMENT (unless noted otherwise in these Specifications or the Drawings) and the installation of equipment specified in this section, even though the connections may be by others.
- B. Manufacturer Qualifications: Engage a firm experienced in manufacturing food service equipment similar to that indicated for this Project and with a record of successful inservice performance. It is required that all "Fabricated Special" items of equipment such as food service units, tables, sinks, countertops, etc., described in the following specifications other than by name and catalog numbers, be manufactured by a Food Service Equipment Fabricator who has the manufacturing plant, personnel and

engineering facility to properly design, detail and manufacture high quality food service equipment. The manufacturer shall be subject to the approval of the Architect and owner. All work in the above category shall be manufactured by one manufacturer and shall be of standard unit assembly and of uniform design and finish. The manufacturer of this equipment must be able to show that he has, for the past seven years, been engaged in the manufacture of and distribution of equipment as required under the contract as his principle product.

- C. Source Limitations: Obtain equipment of like families through one source from a single manufacturer.
- D. Product Options: Where equipment is specified by name of manufacturer and model number, it is intended that the designated name and number represents a standard of quality and is not intended to restrict competition in any way. The Architect reserves the right to accept or reject each proposed substitution and such decision shall be final and binding upon all parties. All proposed equipment substitutions shall be submitted at least ten (10) days prior to date of the bid to the Architect and all substitutions must acquire pre-bid approval. It is furthermore the intention of these specifications to produce a set of Food Service Equipment to meet the needs of the Owner. Among the primary requirements are sanitation, ready accessibility for cleaning, low cost maintenance and operation, strength and ruggedness. Any construction detail or evasion of any of the specification requirements shall be cause for rejection.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Review methods and procedures related to food service equipment including, but not limited to, the following:
  - 1. Review access requirements for equipment delivery.
  - 2. Review equipment storage and security requirements.
  - 3. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
  - 4. Review structural loading limitations.
  - 5. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- F. The Drawings indicated the desired basic arrangement and dimensions of the equipment. Minor deviations may be substituted for approval, provided basic requirements are met and no major rearrangement of service to the equipment is

- required to affect the proposed alteration. These deviations shall be made without expense to the Owner.
- G. Operational and functional tests of the installed equipment are required. Defects or deficiencies shall be corrected to the satisfication of the Architect or Owners at the expense of the Contractor. Consult the Mechanical and Electrical Connections Drawings and they're accompanying Specifications to determine additional requirements of the work, and shall cooperate with all trades to insure a satisfactory installation.
- H. The electrical wiring of motors, motor starters, switches and termostats of the equipment shall be an integral part of the unit which shall contain a junction box for connection of electrical service. All motor driven equipment shall have thermal overload and underload protection.

# 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver food service equipment as factory-assembled units with protective crating and covering.
- B. Store food service equipment in original protective crating and covering and in a dry location.

# 1.07 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions of food service equipment installation areas by field measurements before equipment fabrication and indicate measurements on Shop Drawings and Coordination Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

### 1.08 SUBMITTALS

- A. Product Data: Within 30 days after notice to proceed, and before equipment is purchased, submit Product Data for approval. Product Data shall include the manufacturer's literature for each equipment item along with a type written specification cover sheet identifying equipment characteristics, utility requirements, and specified options. Material shall be assembled in chronological order by item number as specified in the Equipment Schedule and in these Specifications.
- B. Shop Drawings: Verify all field measurements on the job site to insure proper fitting of all equipment. Within 30 days after notice to proceed, and before equipment is purchased, submit Shop Drawings for approval. Drawings, drawn on a scale of 1/4" equal 1 foot, showing and giving detailed information of mechanical and electrical utility service lines, each on separate sheets. Submit at the same time as Product Data

and technical data sheets.

- C. Coordination Drawings: For locations of food service equipment and service utilities. Key equipment with item numbers and descriptions indicated in Contract Documents. Include plans and elevations of equipment, access- and maintenance-clearance requirements, details of concrete or masonry bases and floor depressions, and serviceutility characteristics. The F.S.E.C. will submit for approval as soon as possible and within 30 days after notice to proceed, roughing-in drawings in a minimum scale of 1/4" = 1'-0". These drawings will indicate the size and where each hot and cold water, waste, steam, steam return, gas, indirect waste, and electric connection is to stub out of the walls or floor. All items including Future, Owner Furnished, and Not-In-Contract Items, mentioned in the Itemized Specifications shall be provided for on this drawing. Each stub-out point will be dimensioned so that the total of individual dimensions on a line will equal the known distance between walls or columns or two other reference points. The roughing-in drawings will also indicate the dimensions of floor depressions, raised bases and wall openings for equipment. The services will be roughed-in to suit the drawing and the F.S.E.C. shall be responsible for conforming to these conditions with his equipment and connections thereto. In addition to the roughing-in drawings, the F.S.E.C. shall submit to the Architect for approval a Food Service Equipment Schedule which will indicate in reasonable detail the pertinent mechanical information required to make the hook-ups, i.e., the maximum utility demands, the quantity, exact size and connection characteristic of all valves, faucets, etc. This shall include future and not-in-contract items.
- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for exposed products with color finishes.
- E. Samples for Verification: Of each type of exposed finish required, minimum 4-inch-(100-mm-) square or 6-inch-(150-mm-) long sections of linear shapes and of same thickness and material indicated for work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- F. Product Certificates: Manufacturers of refrigeration systems and walk-in cooler/freezer compartment structures shall provide a written document signed by a regularly employed representative certifying that systems and/or structures comply with factory standards for assembly and comply with requirements and will maintain operating temperatures indicated in the areas or equipment that they will serve. Fire system installer shall provide written certification that fire suppression system complies with all applicable codes.
- G. Maintenance & Operational Data: F.S.E.C. to furnish, prior to final acceptance, three (3) sets of dimensional prints, data sheets, spare parts lists and operating instructions for

each piece of equipment; each set bound in three-ring hard board cover. Operation, maintenance, and parts data for food service equipment to include in the maintenance manuals specified in Division 1. Provide video presentations to the owner (for future reference) on the care and operation of each piece of equipment. Include a product schedule as follows:

- 1. Product Schedule: For each food service equipment item, include item number and description indicated in Contract Documents, manufacturer's name and model number, and authorized service agencies' addresses and telephone numbers.
- H. A complete submittal is required to not delay review. Rough-In Drawings cannot be reviewed without cut sheets and all shop drawings requiring utility hook-ups.Partial Submittals will not be accepted.

#### 1.09 COORDINATION

- A. Coordinate equipment layout and installation with other work, including light fixtures, HVAC equipment, and fire-suppression system components.
- B. Coordinate location and requirements of service-utility connections.

#### 1.10 WARRANTY

- A. See Section 01 7700 Project Closeout, for additional warranty requirements.
- B. Workmanship and Guarantees:
  - 1. Equipment shall be delivered in an undamaged condition upon completion. All workmanship and labor shall be of the best in their respective fields and skilled mechanics of the trades involved.
- C. All equipment as specified in this Section shall be guaranteed for a period of one year from the start of Final Acceptance. If, at any time within this warranty period of one year, any equipment that is found to be faulty due to poor workmanship, inferior or defective materials, replace said pieces or correct each defective part at no cost to the Owner.
  - 1. Refrigerated items shall have an additional four-year warranty on the compressor unit. On extended compressor warranty, only labor charges after first year shall be paid.
- D. At the end of first year, assign extended warranties to Owners on equipment having more than 1 year from Manufacturer.

#### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Foodservice Equipment:
  - 1. Advance Tabco: advancetabco.com
  - 2. Bayonne Stainless Products Inc.: www.bayonnestainless.com
  - 3. Bunn-O-Matic Corp: www.bunn.com
  - 4. Carlisle Foodservice Products: carlislefsp.com
  - 5. Colorpoint: lowtempind.com
  - 6. Cleveland Range: www.clevelandrange.com
  - 7. Crathco by Grind Master: www.grindmaster.com/crathco
  - 8. Delfield: www.delfield.com
  - 9. Duke Manufacturing: www.dukemfg.com
  - 10. Edlund Co: www.edlundco.com
  - 11. Garland Group: www.garland-group.com
  - 12. Hobart Corp: www.hobartcorp.com.
  - 13. Manitowoc: www.manitowocice.com
  - 14. Masterbuilt Manufacturing: www.masterbuilt.com
  - 15. Metro: www.metro.com
  - 16. Scotsman Ice Systems: www.scotsman-ice.com
  - 17. Southbend: www.southbendnc.com
  - 18. Traulsen: www.traulsen.com
  - 19. True Manufacturing Co: www.truemfg.com
  - 20. Turboair Inc. www.turboairinc.com
  - 21. Victory Refrigeration: www.victoryrefrigeration.com
  - 22. Vulcan Hart Corp: www.vulcanhart.com

23. Substitutions: See Section 01 6000 - Product Requirements.

#### 2.02 MATERIALS

- A. Stanless steel shall be austenitic steel alloy, and must meet the requirements of the American Iron and Steel Institute Designations for Type 201 and Type 304 Stainless Steel. Type 430 Stainless Steel (straight chrome no nickel) shall not be acceptable fo custom built fabricated equipment.
- B. All sheets shall have genuine mill finish of not less than commercial No. 4 on exposed side and with not less than No. 2 on unexposed side. All stainless steel shall be stretcher leveled, with thickness of:
  - 1. 14 Gauge, 16 Gauge, 18 Gauge, or 20 Gauge.
- C. Welding shall be of electric arc or oxy-acetylene gas. Welding shall be done with rod of same material and full penetration in the entire length of the joint. Welds to be flat without buckles, voids or imperfections. All welds shall be ground flush with adjacent surfaces, conditioned to eliminate dangerous surfaces. All shear cuts or bends that tend to open the surface of the metal shall be rewelded, ground and polished. All edges are to be ground and filed to eliminate sharp or rought edges.
- D. When stainless steel sheets have grain running in different directions, the sheets shall be so jointed and welds run and finished in such a manner as to make the sheets appear as one continuous product.

### E. Gauges:

- 1. All gauges of metals, where specified, shall be manufactured to the standards set forth by the U.S. Standard for Sheet Metal.
- 2. Unless specified, no material shall be finished lighter than 20 gauge for custombuilt fabricated equipment.

# F. Sound-Deadening:

1. The undersides of dish tables shall be sound-deadened to no less than 1/8 inch thick and allowed to dry thoroughly before being finished with 2 coats of paint.

# 2.03 FABRICATION

# A. Metal Tops for Tables:

1. Shall be constructed of 14 gauge stainless stell with butt joints welded, ground and polished smooth, resulting in a one piece top without joints and crevices. Tops are to be reinforced by means of 14 gauge stainless steel channel irons, 1 inch by 5

inches by 1 inch. Securely fastened to underside, on 30 inch centers, by studs or welding in a vermin-proof manner. Free standing ends are to be turned down 1-3/4 inch on bull-noise edge or 2 inch rolled down edge with all exposed corners rounded on a 2 1/2 inch radius, or bull-noise corner. Where table borders on or is adjacent to wall, there is to be a 4 inch high backsplash with 1 inch turn back to wall with welded enclosed ends, unless otherwise specified.

#### 2. Sleeves:

a. Where legs, standards, pipes, or pipe chases come through a work area or table top, they shall pass through 3 inch high stainless steel sleeves, with the periphery fully welded and polished to match adjacent surfaces.

### B. Sinks:

- 1. Shall be constructed of 14 gauge stainless steel sheets with all interior corners rounded on at least a 1/2 inch radius. All bottom shall be fully coved. All joints to be welded, ground, polished, and made to match adjacent surfaces. Provide each sink with a 2 inch chromium plated waste outlet with a stainles steel strainer and Chromium Plated tailpiece. Provide with a rotary lever handle waste valve. Wastes are to be depressed in sink bottoms with bottoms inclining down towards the wastes.
- 2. Support sinks on legs and gussets, as specified, with braces from front to rear only
- 3. All backsplashes against the wall shall be sealed with polysulphide Sealant.
- 4. Each compartment shall have cut-out on rear to accommodate overflow assembly provided with drain assembly. Overflow and drain assemblies shall be installed and made watertight.

### C. Insert Sinks:

 Shall be sized and shaped as specified with same construction as required for other sinks except that no backsplash is required, The sinks are to be welded into tabletops. All welds are to be ground and polished smooth. Provide with wastes as specified for sinks. Legs and gussets shall be furnished where sinks are set at end of tables.

# D. Drain Tables and Drain Boards

1. Shall be constructed of 14 gauge stainless steel, size and shape as specified. They are to be made integral with sinks. The front and free ends are to be constructed with a minimum of 3 inches high 1-1/4 inch to 1-1/2 inch rolled rim on an 180

degree turn, unless otherwise specified. Backsplash shall be same height as for sinks, same construction, and integrally welded with sink. Construct drain tables or boards to allow liquids to drain into sinks.

#### E. Undershelves

1. Undershelves are to be constructed in sections of 18 gauge stainless steel and notched out to fit around legs, and be fixed type. Intermediate shelves are to be constructed of 18 gauge stainless steel and be fixed type construction, unless otherwise specified.

#### F. Overshelves

- 1. Overshelves shall be fabricated of 16 gauge stainless steel with edges rolled down or up and supported as specified.
- 2. Overshelves mounted on table tops shall be supported by 16 gauge stainless steel tubular legs.

#### G. Wall Shelves

1. Wall Shelves shall be fabricated of 16 gauge stainless steel and same construction as "overshelves". Secure brackets to wall with stainless steel screws with expansion shields. Brackets shall be spaced on a maximum of 4 feet on center.

### H. Legs, Braces, Gussets, Feet

- 1. Height of tables and other fabricated items of equipment shall be as specified. Legs shall be of 1 5/8 inch outside diameter, stainless steel 16 gauge tube spaced at intervals of 5 inch 6 inch centers.
- 2. Legs are to be braced by 1 5/8 inch outside diameter stainless steel 16 gauge tube undershelf welded to legs, 10 inch above the floor. Weld all around periphery at joint to legs and grind smooth. The braces shall be constructed to form rectangular, or "H" frames, and there shall be at least one brace welded to each leg.
- 3. Gussets shall be stainless steel NSF approved, cylinderical type with set screw. Leg gussets are to be welded to underside of tables, to reinforcing channels, and underside of sinks.
- 4. Feet shall be stainless steel adjustable bullet shape, fully enclosed, tightly fitting the leg. Provide 1 inch up and down adjustment from the central position, at no time exposing any threads. Adjustments are to be easily made by hand without the use of tools.

# 2.04 EQUIPMENT

- A. Equipment Schedule: Refer to the Drawings.
- B. Installation Accessories: Provide rough-in hardware, supports and connections, attachment devices, closure trim, and accessories as required for complete installation.

#### PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, service-utility connections, and other conditions affecting installation and performance of food service equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine roughing-in for piping, mechanical, and electrical systems to verify actual locations of connections before installation.

### 3.02 INSTALLATION

- A. Install food service equipment level and plumb, according to manufacturer's written instructions, original design, and referenced standards.
- B. Complete equipment field assembly, where required, using methods indicated.
  - 1. Provide closed butt and contact joints that do not require a filler.
  - Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish. Comply with welding requirements in "Fabrication, General" Article.
- C. Install equipment with access and maintenance clearances according to manufacturer's written instructions and requirements of authorities having jurisdiction.
- D. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections. Provide removable access doors for service as required.
- E. Except for mobile and adjustable-leg equipment, securely anchor and attach items and accessories to walls, floors, or bases with stainless-steel fasteners, unless otherwise indicated.
- F. Install hoods to comply with NFPA 96 requirements and to remain free from vibration when operating.

- G. Install trim strips and similar items requiring fasteners in a bed of sealant. Fasten with stainless-steel fasteners at 36 inches (1200 mm) o.c. maximum.
- H. Install sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Provide airtight, watertight, vermin-proof, sanitary joints.
- I. Provide light bulbs in all equipment where required.

### 3.03 PROTECTING

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure food service equipment is without damage or deterioration at the time of Final Acceptance.

#### 3.04 TESTING

- A. Startup Services: Engage factory-authorized service representatives to perform startup services and to demonstrate and train Owner's maintenance personnel as specified below.
  - Coordinate food service equipment startup with service-utility testing, balancing, and adjustments. Do not operate steam lines before they have been cleaned and sanitized.
  - 2. Remove protective coverings and clean and sanitize equipment, both inside and out, and relamp equipment with integral lighting. Where applicable, comply with manufacturer's written cleaning instructions.
  - 3. Test each equipment item for proper operation. Repair or replace equipment that is defective in operation, including units that operate below required capacity or that operate with excessive noise or vibration.
  - 4. Test refrigeration equipment's ability to maintain specified operating temperature under heavy-use conditions. Repair or replace equipment that does not maintain specified operating temperature.
  - 5. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - 6. Test motors and rotating equipment for proper rotation and lubricate moving parts according to manufacturer's written instructions.
  - 7. Test water, drain, gas, steam, oil, refrigerant, and liquid-carrying components for leaks. Repair or replace leaking components.

- 8. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance for each food service equipment item. Provide video cassettes of demos either on-site recording or Manufacturer produced to owner for his/her future reference.
- 9. Review data in the operation and maintenance manuals. Refer to Division 1 Section "Project Closeout."
- 10. Schedule training with Owner, through Architect, with at least 7 days' advance notice.

# **END OF SECTION 11 4000**

This page intentionally left blank

#### SECTION 12 2113 - HORIZONTAL LOUVER BLINDS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Horizontal slat louver blinds provide at each newly installed opening as follows:

  1. Readiness Center 1, 2, 3, 9, 10, HM 3, HM 4, HM 5, HM 10.

  2.Unit Supply/GPTB HM 10, HM 11, HM 12
- B. Operating hardware.

#### 1.02 REFERENCE STANDARDS

A. WCMA A100.1 - Safety of Corded Window Covering Products; Current Edition, Including All Revisions.

# 1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the placement of concealed blocking to support blinds. See Section 06 1000.

### 1.04 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating physical and dimensional characteristics.
- C. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.
- D. Samples: Submit two samples, 6 inch (152.4 mm) long illustrating slat materials and finish, cord type and color.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 Product Requirements, for additional provisions.

# 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

#### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Horizontal Louver Blinds Without Side Guides:
  - 1. Hunter Douglas: www.hunterdouglas.com.
  - 2. Levolor Contract: www.levolorcontract.com.
  - 3. Graber, division of Springs Window Fashions: www.graberblinds.com.
  - 4. Substitutions: See Section 01 6000 Product Requirements.

# 2.02 BLINDSAND BLIIND COMPONENTS

- A. Description: Horizontal slat louvers hung from full-width headrail with full-width bottom rail.
- B. Blinds: Horizontal slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cord with full range locking; blade angle adjustable by control wand; complying with WCMA A100.1.
- C. Plastic Slats: PVC foam, radiused slat corners.
  - 1. Width: 2 inch (50 mm).
  - 2. Color: As selected by Architect.
  - 3. Texture: Smooth.
- D. Slat Support: Woven polypropylene cord, ladder configuration.
- E. Head Rail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats.
- F. Bottom Rail: Pre-finished, formed PVC with top side shaped to match slat curvature; with end caps. Color: Same as headrail.
- G. Control Wand: Extruded hollow plastic; hexagonal shape.
- H. Headrail Attachment: Wall brackets.
- I. Accessory Hardware: Type recommended by blind manufacturer.

#### 2.03 FABRICATION

A. Determine sizes by field measurement.

- B. Fabricate blinds to cover window frames completely.
- C. At openings requiring multiple blind units, provide separate blind assemblies with space of 1/2" inch (\_\_\_\_ mm) between blinds, located at window mullion centers.

### PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that openings are ready to receive the work.
- B. Ensure structural blocking and supports are correctly placed. See Section 06 1000.

# 3.02 INSTALLATION

- A. Install blinds in accordance with manufacturer's instructions.
- B. Secure in place with flush countersunk fasteners.

### 3.03 TOLERANCES

- A. Maximum Variation of Gap at Window Opening Perimeter: 1/2" inch (\_\_\_\_ mm).
- B. Maximum Offset From Level: 1/8 inch (3 mm).

### 3.04 ADJUSTING

A. Adjust blinds for smooth operation.

# 3.05 CLEANING

A. Clean blind surfaces just prior to occupancy.

### **END OF SECTION 12 2113**

This page intentionally left blank

# SECTION 12 3600 - COUNTERTOPS, INTEGRAL LAVATORIES, AND WINDOW **SILLS**

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

- A. Countertops for architectural cabinet work.
- B. Wall-hung counters and vanity tops.
- C. Sinks molded into countertops.
- D. Window sills.
- E. Also see solid surface soap shelves and thresholds specified in Section 093000 Tiling.

# 1.02 RELATED REQUIREMENTS

- A. Section 06 4100 Architectural Wood Casework.
- B. Section 22 4000 Plumbing Fixtures: Sinks.

### 1.03 REFERENCE STANDARDS

- A. ANSI A208.1 American National Standard for Particleboard; 2009.
- B. ASTM D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2018.
- C. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- D. AWI/AWMAC/WI (AWS) Architectural Woodwork Standards; 2014.
- E. IAPMO Z124 Plastic Plumbing Fixtures; 2017.
- F. ISFA 2-01 Classification and Standards for Solid Surfacing Material; 2013.
- G. NEMA LD 3 High-Pressure Decorative Laminates; 2005.
- H. PS 1 Structural Plywood; 2009.

### 1.04 SUBMITTALS

- A. See Section 01 3001 Submittals, for submittal procedures.
- 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. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- F. Installation Instructions: Manufacturer's installation instructions and recommendations.
- G. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

# 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.06 FIELD 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.

#### PART 2 PRODUCTS

# 2.01 COUNTERTOPS

- A. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
  - 1. Flat Sheet Thickness: 3/4 inch (19 mm), minimum. See drawings for details.
  - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout

thickness.

- Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
- b. Sinks and Bowls: Integral castings; minimum 3/4 inch (19 mm) wall thickness; comply with IAPMO Z124.
  - 1) Provide seamed undermount solid surface lavatory bowl with the following characteristics:
    - (a) Equal to Corian 830 with integral overflow drain.
    - (b) Inside bowl dimensions:
      - (1) 20 13/16" Long
      - (2) 15-5/8 Wide
      - (3) 5-7/8" deep
    - (c) Coordinate lavatory with fixtures specified in plumbing.
    - (d) Color as selected from manufacturers standard colors.
- c. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
- d. Color and Pattern: As selected by Architect from manufacturer's full line.
- 3. Other Components Thickness: 3/4" inch (19 mm), minimum.
- 4. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high and 3/4" thick.

#### 2.02 MATERIALS

- A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
- B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- C. Joint Sealant: Mildew-resistant silicone sealant, clear.
- D. Window Sills: Provide solid surface material window sills matching characteristics lised in part 2.01 above. Refer to drawings for details. Provide colors as selected from

manufacturers standard colors.

### 2.03 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
  - 1. Join lengths of tops using best method recommended by manufacturer.
  - 2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
  - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
  - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
  - 2. Height: 4 inches (102 mm), unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops up to 144 inches (3657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings.

# **PART 3 EXECUTION**

#### 3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

#### 3.02 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.

### 3.03 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Seal joint between back/end splashes and vertical surfaces.

### 3.04 CLEANING

- A. Clean countertops surfaces thoroughly.
- B. Clean other solid surface material thoroughly.

# 3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

# END OF SECTION 12 3600

This page intentionally left blank

#### **SECTION 13 3419 - METAL BUILDING SYSTEMS**

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

- A. Manufacturer-engineered, shop-fabricated structural steel building frame.
- B. Metal wall and roof panels including gutters and downspouts.
- C. Coordination of exterior doors, windows, and louvers.

# 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 0000 Building Concrete Work
- C. Section 05 5000 Metal Fabrications.
- D. Section 07 6200 Sheet Metal Flashing
- E. Section 07 7123 Manufactured Gutters and Downspouts
- F. Section 07 9200 Joint Sealants: Sealing joints between accessory components and wall system.
- G. Section 08 1113 Hollow Metal Doors and Frames.
- H. Section 08 3323 Overhead Coiling Doors
- I. Section 08 4313 Aluminum-Framed Storefronts

#### 1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- D. ASTM A325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2014.
- E. ASTM A325M Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.

- F. ASTM A500/A500M Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- G. ASTM A501/A501M Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- H. ASTM A529/A529M Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2014.
- I. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- J. ASTM C665 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- K. ASTM C920 Standard Specification for Elastomeric Joint Sealants; 2014.
- L. ASTM C1107/C1107M Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.
- M. ASTM F3125/F3125M Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- N. AWS A2.4 Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- O. IAS AC472 Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2012.
- P. SSPC-Paint 20 Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

# 1.04 DESIGN REQUIREMENTS

A.	Installed Thermal	Resistance of	Wall System:	R value of 19	(RSI value of	_).
----	-------------------	---------------	--------------	---------------	---------------	-----

В.	Installed Therma	l Resistance of	f Roof Sys	stem: R val	lue of 30 (	RSI va	lue of )	
----	------------------	-----------------	------------	-------------	-------------	--------	----------	--

# 1.05 SYSTEM PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal building systems capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

- 1. Engineer metal building systems according to procedures in MBMA's "Metal Building Systems Manual."
- 2. Design Loads: As indicated on Drawings, as minimum.
- 3. Design Loads: As required by MBMA's "Metal Building Systems Manual." AISC Standards, IBC 2015.
- 4. Live Loads: Include vertical loads induced by the building occupancy indicated on Drawings. Include loads induced by maintenance workers, materials, and equipment for roof live loads.
- 5. Wind Loads: Include horizontal loads induced by a basic wind speed corresponding to a 10-year, mean-recurrence interval at project site as required by code. See drawings for minimum design wind load.
- 6. Collateral Loads: Include additional dead loads other than the weight of metal building system for permanent items such as sprinklers, mechanical systems, electrical systems, and ceilings.
- 7. Load Combinations: Design metal building systems to withstand the most critical effects of load factors and load combinations as required by MBMA, AISC and IBC 2015.
- 8. Deflection Limits: Engineer assemblies to withstand design loads with deflections no greater than the following:
  - a. Purlins and Rafters: Vertical deflection of 1/240 of the span.
  - b. Girts: Horizontal deflection of 1/240 of the span.
- 9. Design secondary framing system to accommodate deflection of primary building structure and construction tolerances, and to maintain clearances at openings.
- B. Seismic Performance: Design and engineer metal building systems capable of withstanding the effects of earthquake motions determined according to IBC'09

# 1.06 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

#### 1.07 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on profiles, component dimensions, fasteners.

- C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections; wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, installation; framing anchor bolt settings, sizes, and locations from datum, foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature for the state where project is located.
- D. Samples: Submit two samples of precoated metal panels for each color selected,
   \_2\_by\_\_2\_ inch (\_\_\_by\_\_\_ mm) in size illustrating color and texture of finish.
- E. Manufacturer Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472. Include statement that manufacturer designs and fabricates metal building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding components specifically designed to support and transfer loads and properly assembled components form a complete or partial building shell.
- F. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement, and all other information for correct and complete erection and installation of all componenets.
- G. Manufacturer Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472.
  - 1. Include statement that manufacturer designs and fabricates metal building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding components specifically designed to support and transfer loads and properly assembled components form a complete or partial building shell.
- H. Project Record Documents: Record actual locations of concealed components and utilities.
- I. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below.
  - 1. Accessories: Nominal 12 inch long Samples for each type of accessory.
- J. Product Certificates: For each type of metal building system, signed by product manufacturer.
  - 1. Letter of Design Certification: Signed and sealed by a qualified professional engineer licensed to practice in the State of Alabama. Include the following:

- a. Name and location of Project.
- b. Order number.
- c. Name of manufacturer.
- d. Name of Contractor.
- e. Building dimensions including width, length, height, and roof slope.
- f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
- g. Governing building code and year of edition.
- h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
- i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
- j. Building-Use Category: Indicate category of building use and its effect on load importance factors.
- k. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.
- K. Welding certificates.
- L. Erector Certificate: Signed by manufacturer certifying that erector complies with the following requirements:
  - 1. Qualification Data: Installation of the metal roofing panel and roof related accessories shall be performed by roofers, preferred, certified and authorized by the manufacturer as trained and qualified to erect the manufacturer's product. Certification of the contractor cannot exceed 3 years from date of original certification without proof of re-certification from the manufacturer. Roofing contractor must provide a certified project manager, full time, throughout the duration of the roofing installation. The project manager will represent the certification program provided by the manufacturer, representing the correct standards and procedures as detailed by the manufacturers specifications and designs.

- 2. Roofing contractor must submit a letter from the manufacturer of the standing seam metal roofing system, certifying the date of certification from the manufacturer and the dates and year the roofing contractor attended school for certification or re-certification.
- 3. Maintain a minimum of \$1,000,000 general liability coverage for each loss and/or provide Certificate of Insurance for Full Value of the project as directed by the Architect/Owner or Owner representative.
- 4. Maintain sufficient worker's compensation coverage as mandated by law.
- 5. Have no viable claims pending, regardless of negligent acts, defective workmanship on previously performed or current projects.
- 6. Have not filed for protection from creditors under any state or federal insolvency or debtor relief statues or codes.
- 7. Have installed five (5) projects of similar scope and magnitude that have been in service for minimum of 2 years with satisfactory performance of the entire roof system.
- 8. Installer must execute 100% of roof system installation, utilizing employees that are confirmed as full time employees of the contractor. Second and third tier subcontractors for the installation of the work in this section shall not be permitted.
- 9. Installer shall be identified as "primary source of business" for standing seam metal roof system.
- M. Material Test Reports: Signed by manufacturers certifying that the following products comply with requirements:
  - 1. Structural steel including chemical and physical properties.
  - 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
  - 4. Nonshrink grout.
- N. Source quality-control test reports.

# 1.08 QUALITY ASSURANCE

A. Erector Qualifications: An experienced erector who has specialized in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

- B. Manufacturer Qualifications: A qualified manufacturer and member of MBMA and AISC.
  - 1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
  - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer licensed in the State of Alabama. Affix engineering seal to all shop drawings and calculations and submit to architect.
- C. 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 surveying services of the kind indicated.
- D. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- E. Source Limitations: Obtain primary metal building system components, including structural framing and metal panel assemblies, through one source from a single manufacturer.
- F. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal building system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
  - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- G. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- H. Structural Steel: Comply with AISC's "Specification for Structural Steel Buildings-Allowable Stress Design, Plastic Design," or AISC's "Load and Resistance Factor Design Specification for Structural Steel Buildings," for design requirements and allowable stresses.
- I. Cold-Formed Steel: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members," or AISI's "Load and Resistance Factor Design Specification for Steel Structural Members," for design requirements and allowable stresses.

#### 1.09 WARRANTY

- A. See Section 01 7800 Closeout Submittals, for additional warranty requirements.
- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to reapir or replace components of metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures, including rupturing, cracking or puncturing.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty period: Twenty (25) years from date of Final Acceptance.
  - 3. Metal roof and wall panel warranties to be able to transfer a minumum of once and have No Dollar Limit.
  - 4. 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 teh Laws of the State of Alabama shall govern all such guarantees.
- C. Special Warranty on panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or reaplace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Finish Warranty Period: Thirty Five (35) years from date of Final Acceptance.
  - 2. 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.

#### PART 2 PRODUCTS

# 2.01 MANUFACTURERS

A. Metal Buildings:

1.	Butler Manufacturing Company;: www.butlermfg.com/#sle.
2.	Ceco Building Systems;: www.cecobuildings.com/#sle.
3.	Chief Buildings;: www.chiefbuildings.com/#sle.

4.	Kirby Building Systems;:	www.kirbybuildingsystems.com/#sle.
5.	Metallic Building Company;	: www.metallic.com/#sle.

- 6. Nucor Building Systems; \_\_\_\_\_: www.nucorbuildingsystems.com/#sle.
- 7. VP Buildings; \_\_\_\_: www.vp.com/#sle.
- 8. ACI Building Systems
- 9. Vulcan Steel Structures
- 10. American Buildings Company
- 11. United Steel Structures of America
- 12. Substitutions: See Section 01 6000 Product Requirements.

# 2.02 METAL BUILDING

- A. Single span rigid frame.
- B. Primary Framing: Rigid frame of rafter beams and columns, canopy beams, and wind bracing.
- C. Secondary Framing: Purlins, and other items detailed.
- D. Wall System: Preformed metal panels of horizontal profile, with sub-girt framing/anchorage assembly and insulation, and accessory components.
- E. Roof System: Preformed metal panels oriented parallel to slope, with sub-girt framing/anchorage assembly, insulation, and liner panels, and accessory components.
- F. Roof Slope: 1 inches in 12 inches (\_\_\_\_\_).

### 2.03 MATERIALS - FRAMING

- A. Structural Steel Members: ASTM A36/A36M.
- B. Structural Tubing: ASTM A500/A500M Grade B cold-formed.
- C. Plate or Bar Stock: ASTM A529/A529M, Grade 50.
- D. Anchor Bolts: ASTM A307, galvanized to ASTM A153/A153M.
- E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.

- F. Welding Materials: Type required for materials being welded.
- G. Primer: SSPC-Paint 20 zinc rich.
- H. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
  - 1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
  - 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).

# 2.04 MATERIALS - WALLS AND ROOF

#### A. Roof Panel

- 1. Concealed Finish: ASTM D 1005 Backer .5 mils minimum PVDF thickness.
- 2. Standing Seam Roof Panels equalt to MBCI, BattenLok HS. Refer to Section 07 4113 metal Roof Panels for additional requirements. Exposed fasteners are not acceptable, unless the owner gives written approval otherwise.
  - a. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), prepainted by the coil-coating process per ASTM A 755/A 755M.
    - 1) Nominal Coated Thickness: 22 gage.
    - 2) Panel Surface: Smooth with striations in pan
    - 3) Exterior Finish: Fluoropolymer two-coat metallic color system
    - 4) Color: As selected by Architect and Owner from manufacturer's standard colors.
  - b. Panel Width: 16 inches (406 mm).
  - c. Panel Seam Height: 2 inches (50.8 mm).
  - d. Joint Type: Mechanically seamed.
- 3. Comply with ASHRAE 90.1, provide thermal blocks as required between framing and roof system.
- 4. Insulation: Double Layer Banded Insulation System (Total R Value = R-29)

- a. (From outside to inside)
- b. Provide thermal space block. Prior to installation of materials, contractor to allow architect to field verify thermal block installation.
- c. Top Layer Unfaced insulation over purlins, R-10
- d. Bottom Layer: Vinyl-faced insulation between purlins, R-19, white
  - 1) Vinyl faced insulation to have 2 vinyl tab extensions of 12" minimum each for overlapping Z purlin.
  - 2) Contractors option to substitute bottom layer insulation with unfaced insulation between purlins, R-19, and provide continuous vinyl liner below bottom layer of insulation.
- e. Banded steel support system, white. Attached per manufacturers requirements.
- f. Insulation shall be Type II NAIMA 202-96 certified
- g. Flame spread index of 25 or less where exposed.
- B. Exterior Wall Panel: Equal to MBCI PBR panel, 24 gauge.
  - 1. Finishes equal to MBCI PBR panel Kynar 500 fluoropolymer.
  - 2. Insulation: Vinyl-faced insulation over girts, R-19
    - a. Provide thermal space block. prior to installation of materials, contractor to allow architect to field verify thermal block installation.
    - b. Insulation shall be Type II NAIMA 202-96 certified
    - c. Flame spread index of 25 or less where exposed.
- C. Joint Seal Gaskets: Manufacturer's standard type.
- D. Fasteners: Manufacturer's standard type, galvanized to comply with requirements of ASTM A153/A153M, finish to match adjacent surfaces when exterior exposed.
- E. Bituminous Paint: Asphaltic type.
- F. Sealant: ASTM C920, elastomeric sealant with movement capability of at least plus/minus 50 percent; 100 percent silicone; for exposed applications, match adjacent colors as closely as possible.

- G. Trim, Closure Pieces, Caps, Flashings, Gutters, Downspouts, Rain Water Diverter, Fascias, and Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- H. Plumbing Vent Flashing Aluminum bonded to Aluminum flange equal to MBCI.
- I. Ridge Cap Continuous non-ventilating, equal to MBCI.

#### 2.05 ACCESSORY COMPONENTS

A. Translucent roof panels as shown on Roof Plans designed to fit in manufacturers roof system.

#### 2.06 FABRICATION - FRAMING

- 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
- C. Plate or Bar Stock: Provide 42,000 psi minimum yield strength. Comply with ASTM A529, A570
- D. Members fabricated from Cold Form: Comply with requirements for ASTM A307 as necessary for design loads and connections details.
- E. Pre-engineered frame shapes to be per architectural sections.
- F. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.
- G. Provide framing for translucent panel openings.
- H. Provide wall opening framing for doors, windows, and other accessory components.
- I. Structural Framing General:
  - 1. Primary Framing: Shop fabricate framing components to indicated size and section with base plates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
    - a. Make shop connections by welding or by using high-strength bolts.
    - b. Join flanges to webs of built-up members by a continuous submerged arcwelding process.

- c. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
- d. Weld clips to frames for attaching secondary framing members.
- e. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary structural members with specified primer after fabrication.
- Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with base plates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
  - a. Make shop connections by welding or by using non-high-strength bolts.
  - b. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary structural members with specified primer after fabrication.
- J. Primary Framing: Manufacturer's standard structural primary framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
  - General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
    - a. Slight variations in span and spacing may be acceptable if necessary to meet manufacturer's standard, as approved by Architect.
  - 2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
  - 3. Frame Configuration: See drawings.
  - 4. Exterior Column Type: See drawings.
- K. Secondary Framing: Manufacturer's standard secondary framing members, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Fabricate framing from cold-

formed, structural-steel sheet or roll-formed, metallic-coated steel sheet pre painted with coil coating, unless otherwise indicated, to comply with the following:

- 1. Purlins: C- or Z-shaped sections; fabricated from minimum of 16ga thick steel sheet, built-up steel plates, or structural-steel shapes;
- 2. Girts: C- or Z-shaped sections; fabricated from minimum of 16ga steel sheet, built-up steel plates, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees to flange and with minimum 2-1/2-inchwide flanges.
- 3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from 16ga steel sheet, built-up steel plates, or structural-steel shapes; to provide adequate backup for metal panels.
- 4. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch diameter, cold-formed structural tubing to stiffen primary frame flanges.
- 5. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
- 6. Base or Sill Angles: Minimum 3-by-2-by-0.0598-inch zinc-coated (galvanized) steel sheet.
- 7. Purlin and Girt Clips: Minimum 0.0598-inch thick, steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
- 8. Secondary End-Wall Framing: Manufacturer's standard sections fabricated from minimum 0.0598-inch- thick,
- 9. Framing for Openings: Channel shapes; fabricated from minimum 0.0598-inchthick, cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings, and head, jamb, and sill of other openings.
- 10. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.
- L. Canopy Framing: Manufacturer's standard structural-framing system, designed to withstand required loads, fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide frames with attachment plates and splice members, factory drilled for field-bolted assembly.
  - 1. Type: Straight Column
- M. Bracing: Provide adjustable wind bracing as follows:

- 1. Rigid Portal Frames: Fabricate from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
- N. Bolts: Provide plain finish bolts for structural-framing components that are primed or finish painted. Provide zinc-plated bolts for structural-framing components that are galvanized.
- O. Factory-Primed Finish: Apply specified primer immediately after cleaning and pretreating.
  - 1. Prime primary, secondary, and end-wall structural-framing members to a minimum dry film thickness of 1 mil.
    - a. Prime secondary steel framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.
  - 2. Prime galvanized members with specified primer, after phosphoric acid pretreatment.

#### 2.07 MISCELLANEOUS MATERIALS

- A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
  - 1. Fasteners for Metal Panels: Self-drilling Type 410 stainless-steel or self-tapping Type 304 stainless-steel or zinc-alloy-steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal panels.
  - 2. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- C. Metal Flashing, Gutters, Downspouts as specified in Section 07600. The Metal Building System Manufacturer shall supply these materials as part of the metal building systems.
- D. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

- E. Sheet Metal and Flashing.
- F. Personal Dood Canopies Equal to Metallic Products 1(8800)356-7746, www.mpvent.com or Design Components, Inc. 1(800)868-9910, www.designcomponents.com
  - 1. Color as selected by Architect.

#### 2.08 FABRICATION - GUTTERS AND DOWNSPOUTS

- A. Fabricate of same material and finish as roofing metal.
- B. Form gutters and downspouts and scuppers of standard profile and size indicated to collect and remove water. Fabricate with connection pieces.
- C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.
- D. Fabricate support straps of same material and finish as roofing metal, color as selected.

## 2.09 FINISHES

- A. Framing Members: Clean, prepare, and shop prime. Do not prime surfaces to be field welded.
- B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone finish, \_\_\_\_\_ color as selected from manufacturer's standard range.
- C. Interior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone finish, \_\_\_\_\_ color as selected from manufacturer's standard range.
- D. All exposed sturcture to be painted white. Refer to paint specificaiton 09 9000.
- E. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- F. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

#### PART 3 EXECUTION

# 3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Erector present, for compliance with requirements for installation tolerances and other conditions affectin performance of work.
  - 1. For the record, prepare written report, endoresed by Erector, listing conditions detrimental to performance of work.
- B. Before erection proceeds, survey elevations and locations of concrete and masonry-bearing surface and locations of anchor rods, bearing plates, and other embedments to receive structural frmaing, with Erector present, for compliance with requirements and metal building systems manfufactures tolerances.
  - 1. Engage land surveyor to perform surveying.
- C. Proceed with erection only after unsatisfactory conditions have been corrected.

# 3.02 ERECTION - FRAMING

- A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Base Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

- E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
  - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.
- F. Primary Framing and End Walls: Erect framing true to line, level, plumb, rigid, and secure. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist cure grout for not less than seven days after placement.
  - Make field connections using high-strength bolts installed according to RCSC's
    "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of
    bolt and type of joint specified.
    - a. Joint Type: Snug tightened or pretensioned.
- G. Secondary Framing: Erect framing true to line, level, plumb, rigid, and secure. Fasten secondary framing to primary framing using clips with field connections using non-high-strength bolts.
  - 1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
  - 2. Locate and space wall girts to suit openings such as doors and windows.
  - 3. Locate canopy framing as indicated.
  - 4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings, use portal frames where required.
  - 1. Locate interior end-bay bracing only where indicated or where approved by A/E.
- I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

#### 3.03 ERECTION - WALL AND ROOF PANELS

- A. Install in accordance with manufacturer's instructions.
- B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.
- C. Fasten cladding system to structural supports, aligned level and plumb.
- D. Locate end laps over supports. End laps minimum 2 inches (50 mm). Place side laps over bearing.
- E. Provide expansion joints where indicated.
- F. Use concealed fasteners.
- G. Install sealant and gaskets, providing weather tight installation.

#### 3.04 ACCESSORY INSTALLATION

- A. Rigidly support and secure components. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.
- B. Install splash pans under each downspout.
- C. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
  - 1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
  - 2. Install components for a complete metal wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
  - 3. Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

#### 3.05 INSTALLATION - ACCESSORY COMPONENTS IN WALL SYSTEM

A. Install door frames, doors, overhead doors, and windows and glass in accordance with manufacturer's instructions.

B. Seal wall and roof accessories watertight and weather tight with sealant in accordance with Section 07 9005.

# 3.06 TOLERANCES

- A. Framing Members: 1/4 inch (6 mm) from level; 1/8 inch (3 mm) from plumb.
- B. Siding and Roofing: 1/8 inch (3 mm) from true position.

# 3.07 CLEANING AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing and accessories.
  - 1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or SSPC-SP 3, "Power Tool Cleaning."
  - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections. NOTE: Requirement to paint metal building components prior to installation of roof

# 3.08 FIELD QUALITY CONTROL

- A. Roofing Consulting Services:
  - 1. The Contractor shall engage the services of a Professional Roof Consultant. The Consultant must be listed as a Professional Member of the International Institute of Building Enclosure Consultants (IIBEC) and provide a certificate of adequate error and omissions insurance. The Consultant shall attend the pre-roofing meeting and perform no less than three (3) inspections during the installation of the new metal roof systems at each building (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 job projgress and any dificiencies noted during the inspections. Upon completion of all punch list items, the Roof Consultant shall provide a letter of certification to the Architect/Owner stating the new wall/roof system has been installed per the requirements of the contract documents, manufacturer's requirements, and all warranty requirements.

- 2. Pre-approved Roof Consultants:
  - a. Williamson & Associates, Inc.

Alex Murray

5120 Roswell Road

Suite 100 South

Atlanta, Georgia 30342

(404) 256-2388

b. Smith Seckman Reid, Inc.

Michael Spach

2995 Sidco Drive

Nashville, TN 37204

(615) 460-0596

c. Nashville Roof Consultants

James R. Oldham

1411 Winding Way Road

Nashville, TN 37216

(615) 238-5737

3. Note: Non-specified Roof Consulting firms must be pre-approved by the Architect. Request for a substituting firm must be submitted "in writting" 5 (five) days prior to the bid opening.

# **END OF SECTION 13 3419**

This page intentionally left blank

# SECTION 135000 - STANDARD PRE-ASSEMBLED PRECAST CONCRETE BUILDING

#### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. There are (2) buildings required.
  - 1. Controlled Waste Facility (approximately 20'-0" x 15'-0").
  - 2. Flammable Materials Storage (approximately 15'-0" x 15'-0").
- B. Building to be delivered and placed on general contractor prepared foundation in accordance with manufacturer's recommendations (PART 3). Precast building to be manufactured by AES PRECAST CO, INC, 3851 17th Street, Northport, AL 35476 (1-800-342-3274), or approved equal. Building to be provided by manufacturer with all necessary openings appurtenances, accessories and electrical and mechanical requirements specified here in and shown on drawings and shown in conformance with manufacturer's structural requirements.

# 1.02 QUALITY ASSURANCE

- A. ACI-318-2002, "Building Code Requirements for Reinforced Concrete". Concrete Reinforcing Institute, "Manual of Standard Practice".
- B. ANSI/ASCE-7-02 "Building Code Requirements for Minimum Design Loads in Buildings and Other Structures".
- C. State Building Code 2015 IBC- Design to withstand wind/suction load of 150psf without damage to components. Provide doors and components specifically designed and tested to meet the performance-based provisions of the Florida Building Code (FBC) and the South Florida Building Code (SFBC) along with the Alabama Building Code and IBC 2015 coastal wind loading requirements.
- D. UL-752 Test Method Level Four (4) for Bullet Resistance certified by an Independent Structural Engineer.
- E. Concrete Reinforcing Institute, "Manual of Standard Practice".
- F. Building fabricator must have a minimum of 5-years experience manufacturing and setting transportable precast concrete buildings.
- G. PCI Design Handbook 6<sup>th</sup> Edition.
- H. International Building Code 2015.
- I. National Electrical Code 2009.
- J. Manual of Steel Construction LRFD AISC 3<sup>rd</sup> Edition.
- K. Manual of Steel Construction ASD AISC 9<sup>th</sup> Edition.

#### 1.03 DIMENSIONS & DESIGN LOADS

- A. Walls are 3" Thick; Floor is 6" Thick with metal grate as detailed; Roof is 4" @ edge and 6" @ center, giving a 2" slope from center to edge.
- B. Design Loads:
  - 1. Seismic load performance category 'C', Exposure Group III
  - 2. Standard Live Roof Load 60 PSF
  - 3. Standard Floor Load 250 PSF
  - 4. Standard Wind Loading 140 MPH
- C. Roof: (Flat) Roof panel shall slope 2" from center to sides. The roof shall extend a minimum of 2 1/2" beyond the wall panel on each side.

- D. Roof, floor and wall panels single component monolithic panels. No roof, floor, or vertical wall joints will be allowed, except at corners. Wall panels shall set on top of floor panel.
- E. Interior height shall be 12'-0".
- F. Walls and roof: 2 hour rated.

#### **PART 2 - PRODUCTS**

#### 2.01 MATERIALS

- A. Concrete: Steel-reinforced, polypropylene fiber reinforced, 4000 PSI minimum 28-day compressive strength, air-entrained (ASTM C260).
- B. Reinforcing Steel: ASTM A615, grade 60 unless otherwise indicated.
- C. Reinforcing Fiber: Polypropylene fiber, Fibermesh @ 1.5 pounds per cubic yard.
- D. Caulking: All joints between panels shall be caulked on the exterior and interior surface of the joints. Caulking shall be SIKAFLEX-1A elastic sealant or equal.
- E. Panel Connections: All panels shall be securely welded together with 1/4" thick steel brackets. Steel is to be of structural quality, hot-rolled carbon complying with ASTM A283, Grade C. Cast-in anchors used for panel connections to be Dayton-Superior #F-63, or equal.

#### 2.03 FINISHES

- A. Interior of Building: Walls and Ceiling to be smooth precast concrete. Floor to be sealed concrete with silicone caulk bead at base of wall and shall have depressed well and galvanized grating with supports as shown on drawings.
- B. Exterior of Building: Wall panels and trim shall be smooth with elastomeric coating in color as selected by Architect.
- C. Roof to have smooth trowel finish, sealed with Hydro-Stop liquid applied roofing system, white.

# **PART 3 - EXECUTION**

### 3.01 SITE PREPARATION

- A. AES Precast Building shall bear fully on concrete slab that has length and width equal to or greater than that of the floor of the building.
- B. Substrate below pavement or slab must have a vertical soil capacity of 1,500 pounds per square foot, and covered with 6 mil vapor barrier. Concrete slab should be poured 4" thick with 12" turndown footing on all sides, using 3,000 PSI concrete, and reinforced with W4 x W4 4" x 4" wire mesh.
- C. Pad or slab should be level to 1/8" in all directions.
- D. 6" concrete spill containment.

# 3.02 ACCESS

A. Contractor must provide level unobstructed area large enough for crane and tractor trailer to park adjacent to pad. Crane must be able to place outriggers within 3'-0" of edge of pad and truck and crane must be able to get side-by-side under their own power. No overhead lines may be within 75' radius of center of pad. Firm roadbed with turns that allow 65' low bed tractor and trailer must be

provided directly to site.

# **3.03 ELECTRICAL** (By precast manufacturer)

- A. 125 Amp single phase breaker panel, exterior mounted.
- B. EMT surface mounted conduit.
- C. (4) 300 watt hazardous location incandescent fixtures with external switch per room.
- D. (6) hazardous location duplex receptacles, 120v 20 amp per room.
- E. (2) 70w exterior light fixture with photocell, HPS.
- F. Interior grounding cable with exterior access, copper.

# 3.04 MECHANICAL / ENVIRONMENTAL

- A. 12" ventilation fan with hazardous location thermostat and external override switch per room.
- B. (2) 16" wall louvers with gravity dampers, rain hoods and screens per room.

# 3.05 ACCESSIBILITY

- A. 4'0" x 9'0" 3 hour fire rated 18 gauge steel door with 16 ga. cast-in-place frame, drip edge, NRP hinges, mortise lockset, hydraulic door closer, aluminum threshold, galvanized, primed and painted.
- B. Conduit entry plate as required. See electrical drawings for coordination of number and size of conduits, etc.

#### 3.06 MISCELLANEOUS

A. DOT and NFPA warning signs.

# **END OF SECTION 13500**

# SECTION 21 0513 - COMMON MOTOR REQUIREMENTS FOR FIRE SUPPRESSION EQUIPMENT

#### PART 1 - GENERAL

# 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on alternating-current power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

# 1.3 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
  - 1. Motor controllers.
  - 2. Torque, speed, and horsepower requirements of the load.
  - 3. Ratings and characteristics of supply circuit and required control sequence.
  - 4. Ambient and environmental conditions of installation location.

#### **PART 2 - PRODUCTS**

# 2.1 GENERAL MOTOR REQUIREMENTS

- A. Comply with requirements in this Section except when stricter requirements are specified in equipment schedules or Sections.
- B. Comply with NEMA MG 1 unless otherwise indicated.

## 2.2 MOTOR CHARACTERISTICS

- A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
- B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

## 2.3 POLYPHASE MOTORS

A. Description: NEMA MG 1, Design B, medium induction motor.

- B. Efficiency: Premium efficient, as defined in NEMA MG 1.
- C. Service Factor: 1.15.
- D. Multispeed Motors: Variable torque.
  - 1. For motors with 2:1 speed ratio, consequent pole, single winding.
  - 2. For motors with other than 2:1 speed ratio, separate winding for each speed.
- E. Multispeed Motors: Separate winding for each speed.
- F. Rotor: Random-wound, squirrel cage.
- G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- H. Temperature Rise: Match insulation rating.
- I. Insulation: Class F.
- J. Code Letter Designation:
  - 1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
  - 2. Motors Smaller Than 15 HP: Manufacturer's standard starting characteristic.
- K. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

# 2.4 ADDITIONAL REQUIREMENTS FOR POLYPHASE MOTORS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Motors Used with Variable-Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
  - 1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width-modulated inverters.
  - 2. Premium-Efficient Motors: Class B temperature rise; Class F insulation.
  - 3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
  - 4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

# 2.5 SINGLE-PHASE MOTORS

- A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
  - 1. Permanent-split capacitor.
  - 2. Split phase.
  - 3. Capacitor start, inductor run.
  - 4. Capacitor start, capacitor run.

- B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
- C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
- D. Motors 1/20 HP and Smaller: Shaded-pole type.
- E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

# **PART 3 - EXECUTION (Not Applicable)**

END OF SECTION

#### SECTION 21 05 17 - SLEEVES AND SLEEVE SEALS FOR FIRE-SUPPRESSION PIPING

# **PART 1 - GENERAL**

#### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

# 1.2 SUMMARY

- A. Section Includes:
  - 1. Sleeves.
  - 2. Stack-sleeve fittings.
  - 3. Sleeve-seal systems.
  - 4. Sleeve-seal fittings.
  - 5. Grout.
  - 6. Silicone sealants.

#### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

## 1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

#### **PART 2 - PRODUCTS**

## 2.1 SLEEVES

- A. Cast-Iron Pipe Sleeves: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop.
- B. Steel Pipe Sleeves: ASTM A53/A53M, Type E, Grade B, Schedule 40, anticorrosion coated or galvanized, with plain ends and integral welded waterstop collar.
- C. Galvanized-Steel Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- D. PVC Pipe Sleeves: ASTM D1785, Schedule 40.
- E. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.
- F. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

#### 2.2 STACK-SLEEVE FITTINGS

- A. Description: Manufactured, Dura-coated or Duco-coated galvanized cast-iron sleeve with integral clamping flange for use in waterproof floors and roofs. Include clamping ring, bolts, and nuts for membrane flashing.
  - 1. Underdeck Clamp: Clamping ring with setscrews.

#### 2.3 SLEEVE-SEAL SYSTEMS

#### A. Description:

- 1. Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
- 2. Designed to form a hydrostatic seal of 20 psig minimum.
- 3. Sealing Elements: Nitrile (Buna N) interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size.
- 4. Pressure Plates: Carbon steel or Stainless steel.
- 5. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, ASTM B633 or Stainless steel of length required to secure pressure plates to sealing elements.

#### 2.4 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall.
- B. Plastic or rubber waterstop collar with center opening to match piping OD.

# 2.5 GROUT

- A. Description: Nonshrink, for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

# 2.6 SILICONE SEALANTS

- A. Silicone, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 25, Use NT.
- B. Silicone, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T and NT. Grade P Pourable (self-leveling) formulation is for opening in floors and other horizontal surfaces that are not fire rated.

C. Silicone Foam: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

# **PART 3 - EXECUTION**

#### 3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
  - 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
  - 1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
  - 2. Cut sleeves to length for mounting flush with both surfaces.
    - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
  - 3. Using grout or silicone sealant, seal space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
  - 1. Cut sleeves to length for mounting flush with both surfaces.
  - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
  - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint.
- E. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke Barrier Penetrations: Maintain indicated fire or smoke rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with fire- and smoke-stop materials. Comply with requirements for firestopping and fill materials.

# 3.2 STACK-SLEEVE-FITTING INSTALLATION

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
  - 1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
  - 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 07 6200 "Sheet Metal Flashing and Trim."
  - 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level
  - 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.

- 5. Use silicone sealant to seal around the outside of stack-sleeve fittings.
- B. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke Barrier Penetrations: Maintain indicated fire or smoke rating of floors at pipe penetrations. Seal pipe penetrations with fire- or smoke-stop materials. Comply with requirements for firestopping.

# 3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

# 3.4 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Use grout or silicone sealant, to seal the space around outside of sleeve-seal fittings.

# 3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
  - 1. Leak Test: After allowing for a full cure, test sleeves and sleeve seals for leaks. Repair leaks and retest until no leaks exist.
- B. Sleeves and sleeve seals will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

#### 3.6 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
  - 1. Exterior Concrete Walls above Grade:
    - a. Piping Smaller Than NPS 6: Cast-iron pipe sleeves, Steel pipe sleeves or Sleeve-seal fittings.
    - b. Piping NPS 6 and Larger: Cast-iron pipe sleeves, Steel pipe sleeves or Sleeve-seal fittings.
  - 2. Exterior Concrete Walls below Grade:

- a. Piping Smaller Than NPS 6: Cast-iron pipe sleeves with sleeve-seal system, Steel pipe sleeves with sleeve-seal system, or Sleeve-seal fittings.
  - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
- b. Piping NPS 6 and Larger: Cast-iron pipe sleeves with sleeve-seal system or Steel pipe sleeves with sleeve-seal system.
  - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.

#### 3. Concrete Slabs-on-Grade:

- a. Piping Smaller Than NPS 6: Cast-iron pipe sleeves with sleeve-seal system, Steel pipe sleeves with sleeve-seal system, or Sleeve-seal fittings.
  - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
- b. Piping NPS 6 and Larger: Cast-iron pipe sleeves with sleeve-seal system, Steel pipe sleeves with sleeve-seal system, or Sleeve-seal fittings.
  - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.

# 4. Concrete Slabs above Grade:

- a. Piping Smaller Than NPS 6: Steel pipe sleeves, PVC pipe sleeves, Stack-sleeve fittings, Sleeve-seal fittings, Molded-PE or -PP sleeves, or Molded-PVC sleeves.
- b. Piping NPS 6 and Larger: Steel pipe sleeves, PVC pipe sleeves, or Stack-sleeve fittings.

# 5. Interior Partitions:

- a. Piping Smaller Than NPS 6: Steel pipe sleeves.
- b. Piping NPS 6 and Larger: Galvanized-steel sheet sleeves.

#### END OF SECTION

#### SECTION 21 05 18 - ESCUTCHEONS FOR FIRE-SUPPRESSION PIPING

#### **PART 1 - GENERAL**

# 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Escutcheons.
  - 2. Floor plates.

#### 1.3 **DEFINITIONS**

A. Existing Piping to Remain: Existing piping that is not to be removed and that is not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

# 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

# **PART 2 - PRODUCTS**

#### 2.1 ESCUTCHEONS

- A. One-Piece, Steel Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Stainless-Steel Type: With polished stainless-steel finish.
- C. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- D. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished, chrome-plated finish and spring-clip fasteners.
- E. One-Piece, Stamped-Steel Type: With polished, chrome-plated finish and spring-clip fasteners.
- F. Split-Plate, Stamped-Steel Type: With polished, chrome-plated finish; concealed hinge; and spring-clip fasteners.

# 2.2 FLOOR PLATES

A. Split Floor Plates: Steel with concealed hinge.

#### **PART 3 - EXECUTION**

# 3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
  - 1. Escutcheons for New Piping and Relocated Existing Piping:
    - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep pattern.
    - b. Chrome-Plated Piping: One-piece cast brass with polished, chrome-plated finish.
    - c. Insulated Piping: One-piece cast brass with polished, chrome-plated finish.
    - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece cast brass with polished, chrome-plated finish.
    - e. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece cast brass with polished, chrome-plated finish.
    - f. Bare Piping in Unfinished Service Spaces: One-piece cast brass with polished, chrome-plated finish.
    - g. Bare Piping in Equipment Rooms: One-piece cast brass with polished, chrome-plated finish.
  - 2. Escutcheons for Existing Piping to Remain:
    - a. Bare Piping at Wall and Floor Penetrations in Finished Spaces: Split-plate, stamped steel with concealed hinge with polished, chrome-plated finish.
    - b. Bare Piping in Unfinished Service Spaces: Split-plate, stamped steel with concealed hinge with polished, chrome-plated finish.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
  - 1. New Piping and Relocated Existing Piping: One-piece, floor plate.
  - 2. Existing Piping: Split floor plate.

# 3.2 FIELD QUALITY CONTROL

A. Using new materials, replace broken and damaged escutcheons and floor plates.

#### END OF SECTION

# SECTION 21 05 23 - GENERAL-DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION PIPING

#### **PART 1 - GENERAL**

# 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Two-piece ball valves with indicators.
  - 2. Bronze butterfly valves with indicators.
  - 3. Iron butterfly valves with indicators.
  - 4. Check valves.
  - 5. Bronze OS&Y gate valves.
  - 6. Iron OS&Y gate valves.
  - 7. NRS gate valves.
  - 8. Indicator posts.
  - 9. Trim and drain valves.

# 1.3 **DEFINITIONS**

- A. NRS: Nonrising stem.
- B. OS&Y: Outside screw and yoke.
- C. SBR: Styrene-butadiene rubber.

#### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of valve.

# 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
  - 1. Protect internal parts against rust and corrosion.
  - 2. Protect threads, flange faces, and weld ends.
  - 3. Set valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
  - 1. Maintain valve end protection.
  - 2. Store valves indoors and maintain at higher-than-ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.
- D. Protect flanges and specialties from moisture and dirt.

#### **PART 2 - PRODUCTS**

# 2.1 SOURCE LIMITATIONS

A. Obtain each type of valve from single manufacturer.

# 2.2 PERFORMANCE REQUIREMENTS

- A. UL Listed: Valves shall be listed in UL's "Online Certifications Directory" under the headings listed below and shall bear UL mark:
  - 1. Fire Main Equipment: HAMV Main Level
    - a. Indicator Posts, Gate Valve: HCBZ Level 1
    - b. Ball Valves, System Control: HLUG Level 3
    - c. Butterfly Valves: HLXS Level 3
    - d. Check Valves: HMER Level 3
    - e. Gate Valves: HMRZ Level 3
  - 2. Sprinkler System & Water Spray System Devices: VDGT Main Level
    - a. Valves, Trim and Drain: VQGU Level 1
- B. FM Global Approved: Valves shall be listed in its "Approval Guide," under the headings listed below:
  - 1. Automated Sprinkler Systems:
    - a. Indicator posts.
    - b. Valves.
      - 1) Gate valves.
      - 2) Check valves
      - 3) Miscellaneous valves.
- C. ASME Compliance:
  - 1. ASME B1.20.1 for threads for threaded-end valves.
  - 2. ASME B16.1 for flanges on iron valves.
  - 3. ASME B31.9 for building services piping valves.
- D. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.
- E. NFPA Compliance for valves:
  - 1. Comply with NFPA 13, NFPA 14, NFPA 20, and NFPA 24.

- F. Valve Pressure Ratings: Not less than the minimum pressure rating indicated or higher, as required by system pressures.
- G. Valve Sizes: Same as upstream piping unless otherwise indicated.

#### H. Valve Actuator Types:

- 1. Worm-gear actuator with handwheel for quarter-turn valves, except for trim and drain valves
- 2. Handwheel: For other than quarter-turn trim and drain valves.
- 3. Handlever: For quarter-turn trim and drain valves NPS 2 and smaller.

#### 2.3 TWO-PIECE BALL VALVES WITH INDICATORS

#### A. Description:

- 1. UL 1091, except with ball instead of disc and FM Global approved for indicating valves (butterfly or ball type), Class Number 1112.
- 2. Minimum Pressure Rating: 175 psig.
- 3. Body Design: Two piece.
- 4. Body Material: Forged brass or bronze.
- 5. Port Size: Full or standard.
- 6. Seats: PTFE.
- 7. Stem: Bronze or stainless steel.
- 8. Ball: Chrome-plated brass.
- 9. Actuator: Worm gear
- 10. Supervisory Switch: Internal or external.
- 11. End Connections for Valves NPS 1 through NPS 2: Threaded ends.
- 12. End Connections for Valves NPS 2-1/2: Grooved ends.

## 2.4 BRONZE BUTTERFLY VALVES WITH INDICATORS

# A. Description:

- 1. Standard: UL 1091 and FM Global standard for indicating valves, (butterfly or ball type), Class Number 1112.
- 2. Minimum: Pressure rating: 175 psig.
- 3. Body Material: Bronze.
- 4. Seat Material: EPDM.
- 5. Stem Material: Bronze or stainless steel.
- 6. Disc: Stainless steel.
- 7. Actuator: Worm gear.
- 8. Supervisory Switch: Internal or external.
- 9. Ends Connections for Valves NPS 1 through NPS 2: Threaded ends.
- 10. Ends Connections for Valves NPS 2-1/2: Grooved ends.

# 2.5 IRON BUTTERFLY VALVES WITH INDICATORS

# A. Description:

- 1. Standard: UL 1091 and FM Global standard for indicating valves, (butterfly or ball type), Class Number 112.
- 2. Minimum Pressure Rating: 175 psig.

- 3. Body Material: Cast or ductile iron with nylon, EPDM, epoxy, or polyamide coating.
- 4. Seat Material: EPDM.
- 5. Stem: Stainless steel.
- 6. Disc: Ductile iron, nickel plated and EPDM or SBR coated.
- 7. Actuator: Worm gear.
- 8. Supervisory Switch: Internal or external.
- 9. Body Design: Lug or wafer Grooved-end connections.

#### 2.6 CHECK VALVES

# A. Description:

- 1. Standard: UL 312 and FM Global standard for swing check valves, Class Number 1210.
- 2. Minimum Pressure Rating: 175 psig.
- 3. Type: Single swing check.
- 4. Body Material: Cast iron, ductile iron, or bronze.
- 5. Clapper: Bronze, ductile iron, or stainless steel with elastomeric seal.
- 6. Clapper Seat: Brass, bronze, or stainless steel.
- 7. Hinge Shaft: Bronze or stainless steel.
- 8. Hinge Spring: Stainless steel.
- 9. End Connections: Flanged, grooved, or threaded.

#### 2.7 BRONZE OS&Y GATE VALVES

# A. Description:

- 1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y-and NRS-type gate valves).
- 2. Minimum Pressure Rating: 175 psig.
- 3. Body and Bonnet Material: Bronze or brass.
- 4. Wedge: One-piece bronze or brass.
- 5. Wedge Seat: Bronze.
- 6. Stem: Bronze or brass.
- 7. Packing: Non-asbestos PTFE.
- 8. Supervisory Switch: External.
- 9. End Connections: Threaded.

# 2.8 IRON OS&Y GATE VALVES

#### A. Description:

- 1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y-and NRS-type gate valves).
- 2. Minimum Pressure Rating: 175 psig.
- 3. Body and Bonnet Material: Cast or ductile iron.
- 4. Wedge: Cast or ductile iron, or bronze with elastomeric coating.
- 5. Wedge Seat: Cast or ductile iron, or bronze with elastomeric coating.
- 6. Stem: Brass or bronze.
- 7. Packing: Non-asbestos PTFE.
- 8. Supervisory Switch: External.
- 9. End Connections: Flanged or Grooved.

#### 2.9 NRS GATE VALVES

# A. Description:

- 1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y-and NRS-type gate valves).
- 2. Minimum Pressure Rating: 175 psig.
- 3. Body and Bonnet Material: Cast or ductile iron.
- 4. Wedge: Cast or ductile iron with elastomeric coating.
- 5. Wedge Seat: Cast or ductile iron, or bronze with elastomeric coating.
- 6. Stem: Brass or bronze.
- 7. Packing: Non-asbestos PTFE.
- 8. Supervisory Switch: External.
- 9. End Connections: Flanged or Grooved.

#### 2.10 INDICATOR POSTS

# A. Description:

- 1. Standard: UL 789 and FM Global standard for indicator posts.
- 2. Type: Upright.
- 3. Base Barrel Material: Cast or ductile iron.
- 4. Extension Barrel: Cast or ductile iron.
- 5. Cap: Cast or ductile iron.
- 6. Operation: Wrench.

#### 2.11 TRIM AND DRAIN VALVES

#### A. Ball Valves:

- 1. Description:
  - a. Pressure Rating: 175 psig.
  - b. Body Design: Two piece.
  - c. Body Material: Forged brass or bronze.
  - d. Port size: Full or standard.
  - e. Seats: PTFE.
  - f. Stem: Bronze or stainless steel.
  - g. Ball: Chrome-plated brass.
  - h. Actuator: Handlever.
  - i. End Connections for Valves NPS 1 through NPS 2-1/2: Threaded ends.
  - j. End Connections for Valves NPS 1-1/4 and NPS 2-1/2: Grooved ends.

# B. Angle Valves:

- 1. Description:
  - a. Pressure Rating: 175 psig.
  - b. Body Material: Brass or bronze.
  - c. Ends: Threaded.
  - d. Stem: Bronze.
  - e. Disc: Bronze.
  - f. Packing: Asbestos free.
  - g. Handwheel: Malleable iron, bronze, or aluminum.

#### C. Globe Valves:

# 1. Description:

- a. Pressure Rating: 175 psig.
- b. Body Material: Bronze with integral seat and screw-in bonnet.
- c. Ends: Threaded.
- d. Stem: Bronze.
- e. Disc Holder and Nut: Bronze.
- f. Disc Seat: Nitrile.
- g. Packing: Asbestos free.
- h. Handwheel: Malleable iron, bronze, or aluminum.

# **PART 3 - EXECUTION**

#### 3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

# 3.2 INSTALLATION, GENERAL

- A. Comply with requirements in the following Sections for specific valve-installation requirements and applications:
  - 1. Section 21 1313 "Wet-Pipe Sprinkler Systems" for application of valves in wet-pipe, fire-suppression sprinkler systems.
  - 2. Section 21 1316 "Dry-Pipe Sprinkler Systems" for application of valves in dry-pipe, fire-suppression sprinkler systems.
- B. Install listed fire-protection shutoff valves supervised-open, located to control sources of water supply, except from fire-department connections. Install permanent identification signs, indicating portion of system controlled by each valve.
- C. Install double-check valve assembly in each fire-protection water-supply connection.
- D. Install valves having threaded connections with unions at each piece of equipment arranged to allow easy access, service, maintenance, and equipment removal without system shutdown. Provide separate support where necessary.
- E. Install valves in horizontal piping with stem at or above the pipe center.

- F. Install valves in position to allow full stem movement.
- G. Install valve tags. Comply with requirements in Section 21 0553 "Identification for Fire-Suppression Piping and Equipment" for valve tags and schedules and signs on surfaces concealing valves; and the NFPA standard applying to the piping system in which valves are installed. Install permanent identification signs indicating the portion of system controlled by each valve.

# **END OF SECTION**

# SECTION 21 05 29 - HANGERS AND SUPPORTS FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT

#### **PART 1 - GENERAL**

## 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

#### A. Section Includes:

- 1. Metal pipe hangers and supports.
- 2. Trapeze pipe hangers.
- 3. Metal framing systems.
- 4. Thermal hanger-shield inserts.
- 5. Fastener systems.
- 6. Equipment supports.

## B. Related Requirements:

- 1. Section 05 5000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
- 2. Section 21 0516 "Expansion Fittings and Loops for Fire-Suppression Piping" for pipe guides and anchors.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
  - 1. Trapeze pipe hangers.
  - 2. Metal framing systems.
  - 3. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers 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. Detail fabrication and assembly of trapeze hangers.
  - 2. Include design calculations for designing trapeze hangers.

#### 1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

## 1.5 **QUALITY ASSURANCE**

- A. Structural-Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M.
- B. Pipe Welding Qualifications: Qualify procedures and operators according to 2015 ASME Boiler and Pressure Vessel Code, Section IX.

#### **PART 2 - PRODUCTS**

# 2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Comply with NFPA 13.
- B. UL Compliance: Comply with UL 203.

#### 2.2 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
  - 1. Description: Factory-fabricated components, NFPA approved, UL listed, or FM approved for fire-suppression piping support.
  - 2. Galvanized Metallic Coatings: Pregalvanized or hot-dip galvanized.
  - 3. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
- B. Copper Pipe and Tube Hangers:
  - 1. Description: Copper-coated-steel, factory-fabricated components, NFPA approved, UL listed, or FM approved for fire-suppression piping support.
  - 2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

#### 2.3 TRAPEZE PIPE HANGERS

A. Description: MSS SP-58, Type 59, shop- or field-fabricated pipe-support assembly, made from structural-carbon-steel shapes, with NFPA-approved, UL-listed, or FM-approved carbon-steel hanger rods, nuts, saddles, and U-bolts.

#### 2.4 METAL FRAMING SYSTEMS

- A. MFMA Manufacturer Metal Framing Systems:
  - 1. Description: Shop- or field-fabricated pipe-support assembly, made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
  - 2. Standard: Comply with MFMA-4, factory-fabricated components for field assembly.
  - 3. Channels: Continuous slotted carbon-steel channel with inturned lips.
  - 4. Channel Width: Selected for applicable load criteria.
  - 5. Channel Nuts: Formed or stamped nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
  - 6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
  - 7. Metallic Coating: No coating.

- B. Non-MFMA Manufacturer Metal Framing Systems:
  - 1. Description: Shop- or field-fabricated pipe-support assembly, made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
  - 2. Standard: Comply with MFMA-4, factory-fabricated components for field assembly.
  - 3. Channels: Continuous slotted carbon-steel channel with inturned lips.
  - 4. Channel Width: Select for applicable load criteria.
  - 5. Channel Nuts: Formed or stamped nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
  - 6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
  - 7. Metallic Coating: No coating.

#### 2.5 THERMAL HANGER-SHIELD INSERTS

- A. Insulation-Insert Material: Water-repellent-treated, ASTM C533, Type I calcium silicate with 100-psi minimum compressive strength.
- B. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- C. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- D. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

## 2.6 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: NFPA-approved, UL-listed, or FM-approved threaded-steel stud, for use in hardened portland cement concrete, with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: NFPA-approved, UL-listed, or FM-approved, insert-wedge-type anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
  - 1. Indoor Applications: Zinc-coated or Stainless steel.
  - 2. Outdoor Applications: Stainless steel.

## 2.7 EQUIPMENT SUPPORTS

A. Description: NFPA-approved, UL-listed, or FM-approved, welded, shop- or field-fabricated equipment support, made from structural-carbon-steel shapes.

## 2.8 MATERIALS

- A. Aluminum: ASTM B221.
- B. Carbon Steel: ASTM A1011/A1011M.
- C. Structural Steel: ASTM A36/A36M, carbon-steel plates, shapes, and bars; black and galvanized.
- D. Stainless Steel: ASTM A240/A240M.

- E. Grout: ASTM C1107/C1107M, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout, suitable for interior and exterior applications.
  - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
  - 2. Design Mix: 5000-psi, 28-day compressive strength.

#### **PART 3 - EXECUTION**

#### 3.1 APPLICATION

- A. Comply with requirements in Section 07 8413 "Penetration Firestopping" for firestopping materials and installation, for penetrations through fire-rated walls, ceilings, and assemblies.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components, so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

## 3.2 INSTALLATION OF HANGERS AND SUPPORTS

- A. Metal Pipe-Hanger Installation: Comply with installation requirements of approvals and listings. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-58. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
  - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size, or install intermediate supports for smaller-diameter pipes as specified for individual pipe hangers.
  - 2. Field fabricate from ASTM A36/A36M carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal strut systems.
- D. Thermal Hanger-Shield Installation: Install in pipe hanger or shield for insulated piping.
- E. Fastener System Installation:
  - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete, after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual. Install in accordance with approvals and listings.
  - 2. Install mechanical-expansion anchors in concrete, after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions. Install in accordance with approvals and listings.
- F. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

- H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- I. Install lateral bracing with pipe hangers and supports to prevent swaying.
- J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms, and install reinforcing bars through openings at top of inserts.
- K. Load Distribution: Install hangers and supports, so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

# M. Insulated Piping:

- 1. Attach clamps and spacers to piping.
  - a. Piping Operating Above Ambient Air Temperature: Clamp may project through insulation.
  - b. Piping Operating Below Ambient Air Temperature: Use thermal hanger-shield insert with clamp sized to match OD of insert.
  - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
- 2. Install MSS SP-58, Type 39 protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
  - a. MSS SP-58, Type 39 Option: Thermal hanger-shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
- 3. Install MSS SP-58, Type 40 protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
  - a. MSS SP-58, Type 40 Option: Thermal hanger-shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
- 4. Shield Dimensions for Pipe: Not less than the following:
  - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
  - b. NPS 4: 12 inches long and 0.06 inch thick.
  - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
  - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
  - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
- 5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
- 6. Thermal Hanger Shields: Install with insulation of same thickness as piping insulation.

## 3.3 INSTALLATION OF EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment, and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

#### 3.4 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Finish welds at exposed connections, so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

# 3.5 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

## 3.6 PAINTING

## A. Touchup:

- 1. Clean field welds and abraded, shop-painted areas. Paint exposed areas immediately after erecting hangers and supports. Use same materials as those used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - a. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas, and apply galvanizing-repair paint to comply with ASTM A780/A780M.

#### 3.7 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with NFPA requirements for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finishes.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers and metal framing systems and attachments for general service applications.
- F. Use stainless-steel pipe hangers and attachments for hostile environment applications.
- G. Use copper-plated pipe hangers and copper or stainless-steel attachments for copper piping and tubing.
- H. Use thermal hanger-shield inserts for insulated piping and tubing.
- I. Horizontal-Piping Hangers and Supports: Comply with NFPA requirements. Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
  - 2. Steel Pipe Clamps (MSS Type 4): For suspension of NPS 1/2 to NPS 24 if little or no insulation is required.
  - 3. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
  - 4. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
  - 5. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
  - 6. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
  - 7. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
  - 8. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
  - 9. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
- J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24
  - 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- K. Hanger-Rod Attachments: Comply with NFPA requirements.

- L. Building Attachments: Comply with NFPA requirements. Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Steel or Malleable-Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
  - 2. C-Clamps (MSS Type 23): For structural shapes.
  - 3. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
- M. Saddles and Shields: Comply with NFPA requirements. Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
  - 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
  - 3. Thermal Hanger-Shield Inserts: For supporting insulated pipe.
- N. Comply with NFPA requirements for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- O. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- P. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

## **END OF SECTION**

# SECTION 21 05 48 - VIBRATION AND SEISMIC CONTROLS FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT

#### PART 1 - GENERAL

# 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Isolation pads.
  - 2. Isolation mounts.
  - 3. Restrained elastomeric isolation mounts.
  - 4. Restraining braces.

#### 1.3 **DEFINITIONS**

- A. IBC: International Building Code.
- B. ICC-ES: ICC-Evaluation Service.
- C. OSHPD: Office of Statewide Health Planning and Development for the State of California.

# 1.4 PERFORMANCE REQUIREMENTS

- A. Seismic-Restraint Loading:
  - 1. Component Importance Factor: 1.25
  - 2. Component Response Modification Factor: 2
  - 3. Component Amplification Factor: 1
  - 4. Design Spectral Response Acceleration at Short Periods (0.2 Second): .304.
  - 5. Design Spectral Response Acceleration at 1-Second Period: .151.

## 1.5 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
  - 2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.

# 1.6 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the IBC and NFPA 13 unless requirements in this Section are more stringent.
- B. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
- C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

#### **PART 2 - PRODUCTS**

## 2.1 VIBRATION ISOLATORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
  - 1. Ace Mountings Co., Inc.
  - 2. Amber/Booth Company, Inc.
  - 3. California Dynamics Corporation.
  - 4. Isolation Technology, Inc.
  - 5. Kinetics Noise Control.
  - 6. Mason Industries.
  - 7. Vibration Eliminator Co., Inc.
  - 8. Vibration Isolation.
  - 9. Vibration Mountings & Controls, Inc.
- D. Pads: Arranged in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
  - 1. Resilient Material: Oil- and water-resistant neoprene.
- E. Mounts: Double-deflection type, with molded, oil-resistant rubber, hermetically sealed compressed fiberglass, or neoprene isolator elements with factory-drilled, encapsulated top plate for bolting to equipment and with baseplate for bolting to structure. Color-code or otherwise identify to indicate capacity range.
  - 1. Materials: Cast-ductile-iron or welded steel housing containing two separate and opposing, oil-resistant rubber or neoprene elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.

- 2. Neoprene: Shock-absorbing materials compounded according to the standard for bridge-bearing neoprene as defined by AASHTO.
- F. Restrained Mounts: All-directional mountings with seismic restraint.
  - 1. Materials: Cast-ductile-iron or welded steel housing containing two separate and opposing, oil-resistant rubber or neoprene elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.
  - 2. Neoprene: Shock-absorbing materials compounded according to the standard for bridge-bearing neoprene as defined by AASHTO.

#### 2.2 SEISMIC-RESTRAINT DEVICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
  - 1. Amber/Booth Company, Inc.
  - 2. California Dynamics Corporation.
  - 3. Cooper B-Line, Inc.; a division of Cooper Industries.
  - 4. Hilti, Inc.
  - 5. Kinetics Noise Control.
  - 6. Loos & Co.; Cableware Division.
  - 7. Mason Industries.
  - 8. TOLCO Incorporated; a brand of NIBCO INC.
  - 9. Unistrut; Tyco International, Ltd.
- D. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an evaluation service member of ICC-ES.
  - 1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- E. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
- F. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections or Reinforcing steel angle clamped to hanger rod.
- G. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchor bolts and studs.
- H. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices used.

- I. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- J. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- K. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

#### 2.3 FACTORY FINISHES

- A. Finish: Manufacturer's standard prime-coat finish ready for field painting.
- B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
  - 1. Powder coating on springs and housings.
  - 2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
  - 3. Baked enamel or powder coat for metal components on isolators for interior use.
  - 4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

#### **PART 3 - EXECUTION**

## 3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 APPLICATIONS

- A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application.
- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

#### 3.3 VIBRATION-CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

# A. Equipment Restraints:

- 1. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
- 2. Install seismic-restraint devices using approved methods.

# B. Piping Restraints:

- 1. Comply with requirements in MSS SP-127 and NFPA 13.
- 2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
- 3. Brace a change of direction longer than 12 feet.
- C. Install cables so they do not bend across edges of adjacent equipment or building structure.
- D. Install seismic-restraint devices using methods approved by an evaluation service member of ICC-ES providing required submittals for component.
- E. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- F. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- G. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

## H. Drilled-in Anchors:

- 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
- 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
- 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
- 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
- 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
- 6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

#### 3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one

supporting the connections as they approach equipment. Comply with requirements in Section 21 1312 Fire-Suppression Piping.

# **END OF SECTION**

## SECTION 21 05 53 - IDENTIFICATION FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT

#### **PART 1 - GENERAL**

#### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Equipment labels.
  - 2. Warning signs and labels.
  - 3. Pipe labels.
  - 4. Stencils.
  - 5. Valve tags.
  - 6. Warning tags.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment-Label Schedule: Include a listing of all equipment to be labeled and the proposed content for each label.
- D. Valve Schedules: Valve numbering scheme.

## **PART 2 - PRODUCTS**

# 2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
  - 1. Material and Thickness: Brass, 0.032 inch, stainless steel, 0.025 inch, aluminum, 0.032 inch or anodized aluminum, 0.032 inch thick, with predrilled holes for attachment hardware.
  - 2. Letter Color: Red.
  - 3. Background Color: White.
  - 4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  - 5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering

for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

- 6. Fasteners: Stainless-steel rivets or self-tapping screws.
- 7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

## B. Plastic Labels for Equipment:

- 1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, with predrilled holes for attachment hardware.
- 2. Letter Color: Red.
- 3. Background Color: White.
- 4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- 7. Fasteners: Stainless-steel rivets or self-tapping screws.
- 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- D. Equipment-Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

## 2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, with predrilled holes for attachment hardware.
- B. Letter Color: Red.
- C. Background Color: White.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

#### 2.3 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service and showing flow direction according to ASME A13.1.
- B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe-Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
  - 1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
  - 2. Lettering Size: Size letters according to ASME A13.1 for piping.

## E. Pipe-Label Colors:

- 1. Background Color: Safety Red.
- 2. Letter Color: White.

## 2.4 STENCILS

- A. Stencils for Piping:
  - 1. Lettering Size: Size letters according to ASME A13.1 for piping.
  - 2. Stencil Material: Fiberboard or metal.
  - 3. Stencil Paint: Safety Red, exterior, gloss, alkyd enamel. Paint may be in pressurized spray-can form.
  - 4. Identification Paint: White, exterior, alkyd enamel. Paint may be in pressurized spray-can form

#### 2.5 VALVE TAGS

- A. Description: Stamped or engraved with 1/4-inch letters for piping-system abbreviation and 1/2-inch numbers.
  - 1. Tag Material: Brass, 0.032 inch or anodized aluminum, 0.032 inch thick, with predrilled holes for attachment hardware.
  - 2. Fasteners: Brass wire-link chain or S-hook.
  - 3. Valve-Tag Color: Safety Red.
  - 4. Letter Color: White.
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
  - 1. Valve-tag schedule shall be included in operation and maintenance data.

#### **PART 3 - EXECUTION**

## 3.1 PREPARATION

A. Clean piping and equipment surfaces of incompatible primers, paints, and encapsulants, as well as dirt, oil, grease, release agents, and other substances that could impair bond of identification devices.

## 3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be installed.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

# 3.3 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

#### 3.4 PIPE LABEL INSTALLATION

- A. Stenciled Pipe-Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.
  - 1. Identification Paint: Use for contrasting background.
  - 2. Stencil Paint: Use for pipe marking.
- B. Pipe-Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
  - 1. Near each valve and control device.
  - 2. Near each branch connection excluding short takeoffs. Where flow pattern is not obvious, mark each pipe at branch.
  - 3. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
  - 4. At access doors, manholes, and similar access points that permit a view of concealed piping.
  - 5. Near major equipment items and other points of origination and termination.
  - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
  - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- C. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes including pipes where flow is allowed in both directions.

# 3.5 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in fire-suppression piping systems. List tagged valves in a valve-tag schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and with captions similar to those indicated in "Valve-Tag Size and Shape" Subparagraph below:
  - 1. Valve-Tag Size and Shape:

a. Wet-Pipe Sprinkler System: 1-1/2 inches.b. Dry-Pipe Sprinkler System: 1-1/2 inches.

# **END OF SECTION**

#### SECTION 21 11 19 – FIRE DEPARTMENT CONNECTIONS

#### **PART 1 - GENERAL**

#### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Exposed-type fire-department connections.
  - 2. Flush-type fire-department connections.
  - 3. Yard-type fire-department connections.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each fire-department connection.

#### **PART 2 - PRODUCTS**

## 2.1 EXPOSED-TYPE FIRE-DEPARTMENT CONNECTION

- A. Standard: UL 405.
- B. Type: Exposed, projecting, for wall mounting.
- C. Pressure Rating: 175 psig minimum.
- D. Body Material: Corrosion-resistant metal.
- E. Inlets: Brass with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, brass lugged swivel connections, and check devices or clappers.
- F. Caps: Brass, lugged type, with gasket and chain.
- G. Escutcheon Plate: Round, brass, wall type.
- H. Outlet: Back, with pipe threads.
- I. Number of Inlets: Two.
- J. Escutcheon Plate Marking: Similar to "AUTO SPKR & STANDPIPE."

- K. Finish: Rough brass or bronze.
- L. Outlet Size: NPS 4.

#### 2.2 FLUSH-TYPE FIRE-DEPARTMENT CONNECTION

- A. Standard: UL 405.
- B. Type: Flush, for wall mounting.
- C. Pressure Rating: 175 psig minimum.
- D. Body Material: Corrosion-resistant metal.
- E. Inlets: Brass with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, brass lugged swivel connections, and check devices or clappers.
- F. Caps: Brass, lugged type, with gasket and chain.
- G. Escutcheon Plate: Rectangular, brass, wall type.
- H. Outlet: With pipe threads.
- I. Body Style: Horizontal.
- J. Number of Inlets: Two.
- K. Escutcheon Plate Marking: Similar to "AUTO SPKR & STANDPIPE."
- L. Finish: Rough brass or bronze.
- M. Outlet Size: NPS 4.

# 2.3 YARD-TYPE FIRE-DEPARTMENT CONNECTION

- A. Standard: UL 405.
- B. Type: Exposed, freestanding.
- C. Pressure Rating: 175 psig minimum.
- D. Body Material: Corrosion-resistant metal.
- E. Inlets: Brass with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, brass lugged swivel connections, and check devices or clappers.
- F. Caps: Brass, lugged type, with gasket and chain.
- G. Escutcheon Plate: Round, brass, floor type.
- H. Outlet: Bottom, with pipe threads.

I. Number of Inlets: Two.

J. Sleeve: Brass.

K. Sleeve Height: 18 inches.

L. Escutcheon Plate Marking: Similar to "AUTO SPKR & STANDPIPE."

M. Finish, Including Sleeve: Rough brass or bronze.

N. Outlet Size: NPS 4.

#### **PART 3 - EXECUTION**

## 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fire-department connections.
- B. Examine roughing-in for fire-suppression standpipe system to verify actual locations of piping connections before fire-department connection installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

- A. Install wall-type fire-department connections.
- B. Install yard-type fire-department connections in concrete slab support. Comply with requirements for concrete in Section 03 3000 "Cast-in-Place Concrete."
- C. Install two protective pipe bollards around each fire-department connection. Comply with requirements for bollards in Section 05 5000 "Metal Fabrications."
- D. Install automatic (ball-drip) drain valve at each check valve for fire-department connection.

# **END OF SECTION**

#### **SECTION 21 1313 - WET-PIPE SPRINKLER SYSTEMS**

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

#### A. Section Includes:

- 1. Pipes, fittings, and specialties.
- 2. Cover system for sprinkler piping.
- 3. Specialty valves.
- 4. Sprinklers.
- 5. Alarm devices.
- 6. Manual control stations.
- 7. Control panels.
- 8. Pressure gauges.

# B. Related Requirements:

- 1. Section 21 1119 "Fire Department Connections" for exposed-, flush-, and yard-type fire department connections.
- 2. Section 23 0523 "General-Duty Valves for Water-Based Fire-Suppression Piping" for ball, butterfly, check, gate, post-indicator, and trim and drain valves.

#### 1.3 **DEFINITIONS**

- A. High-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure higher than standard 175 psig, but not higher than 250 psig.
- B. Standard-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure of 175-psig maximum.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

# B. Sustainable Design Submittals:

- 1. Product Data: For adhesives, indicating VOC content.
- 2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

- C. Shop Drawings: For wet-pipe sprinkler systems.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Include diagrams for power, signal, and control wiring.
- D. Delegated-Design Submittal: For wet-pipe sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Sprinkler systems, or BIM model, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved.
- B. Qualification Data: For qualified Installer and professional engineer.
- C. Design Data:
  - 1. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.
- D. Welding certificates.
- E. Field Test Reports:
  - 1. Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
  - 2. Fire-hydrant flow test report.
- F. Field quality-control reports.

#### 1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wet-pipe sprinkler systems and specialties to include in emergency, operation, and maintenance manuals.

#### 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of six spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

# 1.8 QUALITY ASSURANCE

# A. Installer Qualifications:

- 1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
  - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.
- B. Welding Qualifications: Qualify procedures and operators according to 2010 ASME Boiler and Pressure Vessel Code.

#### 1.9 FIELD CONDITIONS

- A. Interruption of Existing Sprinkler Service: Do not interrupt sprinkler service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sprinkler service according to requirements indicated:
  - 1. Notify Owner no fewer than two days in advance of proposed interruption of sprinkler service.
  - 2. Do not proceed with interruption of sprinkler service without Owner's written permission.

## **PART 2 - PRODUCTS**

## 2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with NFPA 13.
- C. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.
- D. High-Pressure Piping System Component: Listed for 250-psig minimum working pressure.
- E. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 4000 "Quality Requirements," to design wet-pipe sprinkler systems.
  - 1. Sprinkler system design shall be approved by authorities having jurisdiction.
    - a. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
    - b. Sprinkler Occupancy Hazard Classifications:
      - 1) Automobile Parking Areas: Ordinary Hazard, Group 1.
      - 2) Building Service Areas: Ordinary Hazard, Group 1.
      - 3) Electrical Equipment Rooms: Ordinary Hazard, Group 1.
      - 4) Elevator Machine Room and Hoistway: Ordinary Hazard, Group 1.
      - 5) General Storage Areas: Ordinary Hazard, Group 1.

- 6) Mechanical Equipment Rooms: Ordinary Hazard, Group 1.
- 7) Office and Public Areas: Light Hazard.
- 8) Restaurant Service Areas: Ordinary Hazard, Group 1.
- 2. Minimum Density for Automatic-Sprinkler Piping Design:
  - a. Residential (Dwelling) Occupancy: 0.05 gpm over 400-sq. ft. area.
  - b. Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. area.
  - c. Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. area.
  - d. Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm over 1500-sq. ft. area.
  - e. Extra-Hazard, Group 1 Occupancy: 0.30 gpm over 2500-sq. ft. area.
  - f. Extra-Hazard, Group 2 Occupancy: 0.40 gpm over 2500-sq. ft. area.
  - g. Special Occupancy Hazard: As determined by authorities having jurisdiction.
- 3. Maximum protection area per sprinkler according to UL listing.
- 4. Maximum Protection Area per Sprinkler:
  - a. Residential Areas: 400 sq. ft..
  - b. Office Spaces: 120 sq. ft..
  - c. Storage Areas: 130 sq. ft..
  - d. Mechanical Equipment Rooms: 130 sq. ft..
  - e. Electrical Equipment Rooms: 130 sq. ft..
  - f. Other Areas: According to NFPA 13 recommendations unless otherwise indicated.

#### 2.2 STEEL PIPE AND FITTINGS

- A. Standard-Weight, Galvanized- and Black-Steel Pipe: ASTM A53/A53M,.. Pipe ends may be factory or field formed to match joining method.
- B. Schedule 30, Galvanized- and Black-Steel Pipe: ASTM A135/A135M; ASTM A795/A795M, Type E; or ASME B36.10M wrought steel, with wall thickness not less than Schedule 30 and not more than Schedule 40. Pipe ends may be factory or field formed to match joining method.
- C. Thinwall Galvanized- and Black-Steel Pipe: ASTM A135/A135M or ASTM A795/A795M, threadable, with wall thickness less than Schedule 30 and equal to or greater than Schedule 10. Pipe ends may be factory or field formed to match joining method.
- D. Galvanized- and Black-Steel Pipe Nipples: ASTM A733, made of ASTM A53/A53M, standard-weight, seamless steel pipe with threaded ends.
- E. Galvanized- and Uncoated-Steel Couplings: ASTM A865/A865M, threaded.
- F. Galvanized and Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- G. Malleable- or Ductile-Iron Unions: UL 860.
- H. Cast-Iron Flanges: ASME 16.1, Class 125.
- I. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.
  - 1. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or EPDM rubber gasket.

- a. Class 125 and Class 250, Cast-Iron, Flat-Face Flanges: Full-face gaskets.
- b. Class 150 and Class 300, Ductile-Iron or -Steel, Raised-Face Flanges: Ring-type gaskets.
- 2. Metal, Pipe-Flange Bolts and Nuts: Carbon steel unless otherwise indicated.
- J. Steel Welding Fittings: ASTM A234/A234M and ASME B16.9.
  - 1. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- K. Grooved-Joint, Steel-Pipe Appurtenances:
  - 1. Pressure Rating: 175-psig minimum.
  - 2. Galvanized Grooved-End Fittings for Steel Piping: ASTM A47/A47M, malleable-iron casting or ASTM A536, ductile-iron casting, with dimensions matching steel pipe.
  - 3. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213 rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.
- L. Steel Pressure-Seal Fittings: UL 213, FM Global-approved, 175-psig pressure rating with steel housing, rubber O-rings, and pipe stop; for use with fitting manufacturers' pressure-seal tools.

#### 2.3 COPPER TUBE AND FITTINGS

- A. Drawn-Temper Copper Tube: ASTM B88, Type K (ASTM B88M, Type A) and ASTM B88, Type M.
- B. Cast-Copper, Solder-Joint Fittings: ASME B16.18 pressure fittings.
- C. Wrought-Copper, Solder-Joint Fittings: ASME B16.22 pressure fittings.
- D. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
- E. Cast Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.
- F. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.
- G. Copper-Tube, Mechanically Formed Tee Fitting: For forming T-branch on copper water tube.
  - 1. Description: Tee formed in copper tube according to ASTM F2014.
- H. Grooved, Mechanical-Joint, Copper-Tube Appurtenances:
  - 1. Standard: UL 213.
  - 2. Grooved-End Copper Fittings: ASTM B75 copper tube or ASTM B584 bronze castings.
  - 3. Grooved-End-Tube Couplings: To fit copper tube dimensions; rigid pattern unless otherwise indicated; gasketed fitting EPDM-rubber gasket rated for minimum 180 deg F for use with ferrous housing and steel bolts and nuts; 300 psig minimum CWP pressure rating.
- I. Copper-Tube, Pressure-Seal-Joint Fittings:

- 1. Fittings: Cast-brass, cast-bronze, or wrought-copper with EPDM O-ring seal in each end.
- 2. Minimum 200-psig working-pressure rating at 250 deg F.

#### 2.4 COVER SYSTEM FOR SPRINKLER PIPING

- A. Description: System of support brackets and covers made to protect sprinkler piping.
- B. Brackets: Glass-reinforced nylon.
- C. Covers: Extruded-PVC sections of length, shape, and size required for size and routing of CPVC piping.

#### 2.5 SPECIALTY VALVES

- A. Listed in UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
- B. Pressure Rating:
  - 1. Standard-Pressure Piping Specialty Valves: 175-psig minimum.
  - 2. High-Pressure Piping Specialty Valves: 250-psig minimum.
- C. Body Material: Cast or ductile iron.
- D. Size: Same as connected piping.
- E. End Connections: Flanged or grooved.
- F. Alarm Valves:
  - 1. Standard: UL 193.
  - 2. Design: For horizontal or vertical installation.
  - 3. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gauges, retarding chamber, and fill-line attachment with strainer.
  - 4. Drip cup assembly pipe drain without valves and separate from main drain piping with check valve to main drain piping.
  - 5. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Deluge Valves:
  - 1. Standard: UL 260.
  - 2. Design: Hydraulically operated, differential-pressure type.
  - 3. Include trim sets for alarm-test bypass, drain, electrical water-flow alarm switch, pressure gauges, drip cup assembly piped without valves and separate from main drain line, and fill-line attachment with strainer.
  - 4. Wet, Pilot-Line Trim Set: Include gauge to read diaphragm-chamber pressure and manual control station for manual operation of deluge valve, and connection for actuation device.
- H. Automatic (Ball Drip) Drain Valves:
  - 1. Standard: UL 1726.
  - 2. Pressure Rating: 175-psig minimum.

- 3. Type: Automatic draining, ball check.
- 4. Size: NPS 3/4.
- 5. End Connections: Threaded.

#### 2.6 AIR VENT

# A. Manual Air Vent/Valve:

- 1. Description: Ball valve that requires human intervention to vent air.
- 2. Body: Forged brass.
- 3. Ends: Threaded.
- 4. Minimize Size: 1/2 inch.
- 5. Minimum Water Working Pressure Rating: 300 psig.

## B. Automatic Air Vent:

- 1. Description: Automatic air vent that automatically vents trapped air without human intervention.
- 2. Standard: UL listed or FM Global approved for use in wet-pipe fire sprinkler systems.
- 3. Vents oxygen continuously from system.
- 4. Float valve to prevent water discharge.
- 5. Minimum Water Working Pressure Rating: 175 psig.

## C. Automatic Air Vent Assembly:

- 1. Description: Automatic dual air vent assembly that automatically vents trapped air without human intervention, including Y-strainer and ball valve in a pre-piped assembly.
- 2. Standard: UL listed or FM Global approved for use in wet-pipe fire sprinkler system.
- 3. Vents oxygen continuously from system.
- 4. Float valve to prevent water discharge.
- 5. Minimum Water Working Pressure Rating: 175 psig.

#### 2.7 SPRINKLER PIPING SPECIALTIES

## A. Branch Outlet Fittings:

- 1. Standard: UL 213.
- 2. Pressure Rating: 175-psig minimum.
- 3. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
- 4. Type: Mechanical-tee and -cross fittings.
- 5. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
- 6. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
- 7. Branch Outlets: Grooved, plain-end pipe, or threaded.

# B. Flow Detection and Test Assemblies:

- 1. Standard: UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
- 2. Pressure Rating: 175-psig minimum.
- 3. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
- 4. Size: Same as connected piping.
- 5. Inlet and Outlet: Threaded or grooved.

## C. Branch Line Testers:

- 1. Standard: UL 199.
- 2. Pressure Rating: 175 psig.
- 3. Body Material: Brass.
- 4. Size: Same as connected piping.
- 5. Inlet: Threaded.
- 6. Drain Outlet: Threaded and capped.
- 7. Branch Outlet: Threaded, for sprinkler.

# D. Sprinkler Inspector's Test Fittings:

- 1. Standard: UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
- 2. Pressure Rating: 175-psig minimum.
- 3. Body Material: Cast- or ductile-iron housing with sight glass.
- 4. Size: Same as connected piping.
- 5. Inlet and Outlet: Threaded.

## E. Adjustable Drop Nipples:

- 1. Standard: UL 1474.
- 2. Pressure Rating: 250-psig minimum.
- 3. Body Material: Steel pipe with EPDM-rubber O-ring seals.
- 4. Size: Same as connected piping.
- 5. Length: Adjustable.
- 6. Inlet and Outlet: Threaded.

## F. Flexible Sprinkler Hose Fittings:

- 1. Standard: UL 1474.
- 2. Type: Flexible hose for connection to sprinkler, and with bracket for connection to ceiling grid.
- 3. Pressure Rating: 175-psig minimum.
- 4. Size: Same as connected piping, for sprinkler.

# 2.8 SPRINKLERS

- A. Listed in UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
- B. Pressure Rating for Residential Sprinklers: 175-psig maximum.
- C. Pressure Rating for Automatic Sprinklers: 175-psig minimum.
- D. Pressure Rating for High-Pressure Automatic Sprinklers: 250-psig minimum.
- E. Automatic Sprinklers with Heat-Responsive Element:
  - 1. Early-Suppression, Fast-Response Applications: UL 1767.
  - 2. Nonresidential Applications: UL 199.
  - 3. Residential Applications: UL 1626.
  - 4. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.

- F. Open Sprinklers with Heat-Responsive Element Removed: UL 199.
  - 1. Nominal Orifice:
    - a. 1/2 inch, with discharge coefficient K between 5.3 and 5.8.
    - b. 17/32 inch with discharge coefficient K between 7.4 and 8.2.
- G. Sprinkler Finishes: Chrome plated.
- H. Special Coatings: Wax lead and corrosion-resistant paint.
- I. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.
  - 1. Ceiling Mounting: Chrome-plated steel, one piece, flat.
  - 2. Sidewall Mounting: Plastic, white finish, one piece, flat.
- J. Sprinkler Guards:
  - 1. Standard: UL 199.
  - 2. Type: Wire cage with fastening device for attaching to sprinkler.

#### 2.9 ALARM DEVICES

- A. Alarm-device types shall match piping and equipment connections.
- B. Water-Motor-Operated Alarm:
  - 1. Standard: UL 753.
  - 2. Type: Mechanically operated, with Pelton wheel.
  - 3. Alarm Gong: Cast aluminum with red-enamel factory finish.
  - 4. Size: 8-1/2-inches diameter.
  - 5. Components: Shaft length, bearings, and sleeve to suit wall construction.
  - 6. Inlet: NPS 3/4.
  - 7. Outlet: NPS 1 drain connection.
- C. Electrically Operated Notification Appliances:
  - 1. Electric Bell:
    - a. Standard: UL 464.
    - b. Type: Vibrating, metal alarm bell.
    - c. Size: 6-inch minimum- diameter.
    - d. Voltage: 120 V ac, 60 Hz, 1 phase.
    - e. Finish: Red-enamel or polyester powder-coat factory finish, suitable for outdoor use with approved and listed weatherproof backbox.
  - 2. Strobe/Horn:
    - a. Standard: UL 464.
    - b. Tone: Selectable, steady, Temporal-3 (T-3) in accordance with ISO 8201 and ANSI/ASA S3.41, 2400 Hz, electromechanical, broadband.
    - c. Voltage: 120 V ac, 60 Hz.

- d. Effective Intensity: 110 cd.
- e. Finish: Red, suitable for outdoor use with approved and listed weatherproof backbox. White letters on housing identifying device as for "Fire."
- f. Sign, Integrated: Mount between backbox and strobe/horn with text visible on both sides, above and below strobe/horn. Housing to be shaped to cover surface-mounted weatherproof backbox. Sign is to consist of white lettering on red plastic identifying it as a "Sprinkler Fire Alarm" and instructing viewers to call 911, police, or fire department.

## D. Water-Flow Indicators:

- 1. Standard: UL 346.
- 2. Water-Flow Detector: Electrically supervised.
- 3. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
- 4. Type: Paddle operated.
- 5. Pressure Rating: 250 psig.
- 6. Design Installation: Horizontal or vertical.

#### E. Pressure Switches:

- 1. Standard: UL 346.
- 2. Type: Electrically supervised water-flow switch with retard feature.
- 3. Components: Single-pole, double-throw switch with normally closed contacts.
- 4. Design Operation: Rising pressure signals water flow.

# F. Valve Supervisory Switches:

- 1. Standard: UL 346.
- 2. Type: Electrically supervised.
- 3. Components: Single-pole, double-throw switch with normally closed contacts.
- 4. Design: Signals that controlled valve is in other than fully open position.
- 5. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.10 MANUAL CONTROL STATIONS

- A. Listed in UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide" for hydraulic operation, with union, NPS 1/2 pipe nipple, and bronze ball valve.
- B. Include metal enclosure labeled "MANUAL CONTROL STATION," with operating instructions and cover held closed by breakable strut to prevent accidental opening.

## 2.11 CONTROL PANELS

A. Description: Single-area, two-area, or single-area cross-zoned control panel as indicated, including NEMA ICS 6, Type 1 enclosure, detector, alarm, and solenoid-valve circuitry for operation of deluge valves.

- 1. Listed in UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide" when used with thermal detectors and Class A detector circuit wiring.
- 2. Electrical characteristics are 120-V ac, 60 Hz, with 24-V dc rechargeable batteries.
- 3. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Manual Control Stations, Electric Operation: Metal enclosure, labeled "MANUAL CONTROL STATION," with operating instructions and cover held closed by breakable strut to prevent accidental opening.
- C. Manual Control Stations, Hydraulic Operation: With union, NPS 1/2 pipe nipple, and bronze ball valve. Include metal enclosure labeled "MANUAL CONTROL STATION," with operating instructions and cover held closed by breakable strut to prevent accidental opening.

## D. Panels Components:

- 1. Power supply.
- 2. Battery charger.
- 3. Standby batteries.
- 4. Field-wiring terminal strip.
- 5. Electrically supervised solenoid valves and polarized fire-alarm bell.
- 6. Lamp test facility.
- 7. Single-pole, double-throw auxiliary alarm contacts.
- 8. Rectifier.

#### 2.12 PRESSURE GAUGES

- A. Standard: UL 393.
- B. Dial Size: 3-1/2- to 4-1/2-inch diameter.
- C. Pressure Gauge Range: 0- to 250-psig minimum.
- D. Label: Include "WATER" label on dial face.

#### **PART 3 - EXECUTION**

## 3.1 PREPARATION

- A. Perform fire-hydrant flow test according to NFPA 13 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

## 3.2 SERVICE-ENTRANCE PIPING

A. Connect sprinkler piping to water-service piping for service entrance to building. Comply with requirements for exterior piping in Section 21 1100 "Facility Fire-Suppression Water-Service Piping" for exterior piping.

- B. Install shutoff valve, backflow preventer, pressure gauge, drain, and other accessories indicated at connection to water-service piping.
- C. Install shutoff valve, check valve, pressure gauge, and drain at connection to water service.

#### 3.3 WATER-SUPPLY CONNECTIONS

- A. Connect sprinkler piping to building's interior water-distribution piping. Comply with requirements for interior piping in Section 22 1116 "Domestic Water Piping."
- B. Install shutoff valve, backflow preventer, pressure gauge, drain, and other accessories indicated at connection to water-distribution piping.
- C. Install shutoff valve, check valve, pressure gauge, and drain at connection to water supply.

## 3.4 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated on approved working plans.
  - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
  - 2. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.
- B. Piping Standard: Comply with NFPA 13 requirements for installation of sprinkler piping.
- C. Install seismic restraints on piping. Comply with NFPA 13 requirements for seismic-restraint device materials and installation.
- D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- E. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- G. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.
- H. Install sprinkler piping with drains for complete system drainage.
- I. Install sprinkler control valves, test assemblies, and drain risers adjacent to standpipes when sprinkler piping is connected to standpipes.
- J. Install automatic (ball drip) drain valve at each check valve for fire-department connection, to drain piping between fire-department connection and check valve. Install drain piping to and spill over floor drain or to outside building.
- K. Install alarm devices in piping systems.

- L. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13. In seismic-rated areas, refer to Section 21 0548 "Vibration and Seismic Controls for Fire-Suppression Piping and Equipment."
- M. Install pressure gauges on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gauges with connection not less than NPS 1/4 and with softmetal seated globe valve, arranged for draining pipe between gauge and valve. Install gauges to permit removal, and install where they are not subject to freezing.
- N. Pressurize and check preaction sprinkler system piping and air-pressure maintenance devices.
- O. Fill sprinkler system piping with water.
- P. Install electric heating cables and pipe insulation on sprinkler piping in areas subject to freezing. Comply with requirements for heating cables in Section 21 0533 "Heat Tracing for Fire-Suppression Piping" and for piping insulation in Section 21 0700 "Fire-Suppression Systems Insulation."
- Q. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 21 0517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- R. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 21 0517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- S. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 21 0518 "Escutcheons for Fire-Suppression Piping."

#### 3.5 **JOINT CONSTRUCTION**

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads.

- 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Twist-Locked Joints: Insert plain end of steel pipe into plain-end-pipe fitting. Rotate retainer lugs one-quarter turn or tighten retainer pin.
- I. Steel-Piping, Pressure-Sealed Joints: Join lightwall and Schedule 5 steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.
- J. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
  - 1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.
- K. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- L. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.
- M. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Brazed Joints" Chapter.
- N. Copper-Tubing Grooved Joints: Roll rounded-edge groove in end of tube according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join copper tube and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.
- O. Copper-Tubing, Pressure-Sealed Joints: Join copper tube and copper pressure-seal fittings with tools recommended by fitting manufacturer.
- P. Extruded-Tee Connections: Form tee in copper tube according to ASTM F2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.
- Q. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.
- R. Plastic-Piping, Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
  - 2. CPVC Piping: Join according to ASTM D2846/D2846M Appendix.

#### 3.6 INSTALLATION OF COVER SYSTEM FOR SPRINKLER PIPING

A. Install cover system, brackets, and cover components for sprinkler piping according to manufacturer's "Installation Manual" and NFPA 13 or NFPA 13R for supports.

#### 3.7 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.
- B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.
- C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.

## D. Specialty Valves:

- 1. Install valves in vertical position for proper direction of flow, in main supply to system.
- 2. Install alarm valves with bypass check valve and retarding chamber drain-line connection.
- 3. Install deluge valves in vertical position, in proper direction of flow, and in main supply to deluge system. Install trim sets for drain, priming level, alarm connections, ball drip valves, pressure gauges, priming chamber attachment, and fill-line attachment.

## E. Air Vent:

- 1. Provide at least one air vent at high point in each wet-pipe sprinkler system in accordance with NFPA 13 requirements. Connect vent into top of fire sprinkler piping.
- 2. Provide dielectric union for dissimilar metals, ball valve, and strainer upstream of automatic air vent.
- 3. Pipe from outlet of air vent to drain.

#### 3.8 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of acoustical ceiling panels.
- B. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.
- C. Install sprinklers into flexible, sprinkler hose fittings, and install hose into bracket on ceiling grid.

## 3.9 **IDENTIFICATION**

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

## 3.10 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

- 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
- 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
- 4. Energize circuits to electrical equipment and devices.
- 5. Coordinate with fire-alarm tests. Operate as required.
- 6. Coordinate with fire-pump tests. Operate as required.
- 7. Verify that equipment hose threads are same as local fire department equipment.
- B. Sprinkler piping system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

#### 3.11 CLEANING

- A. Clean dirt and debris from sprinklers.
- B. Only sprinklers with their original factory finish are acceptable. Remove and replace any sprinklers that are painted or have any other finish than their original factory finish.

#### 3.12 **DEMONSTRATION**

A. Train Owner's maintenance personnel to adjust, operate, and maintain specialty valves and pressure-maintenance pumps].

## 3.13 PIPING SCHEDULE

- A. Piping between Fire Department Connections and Check Valves: Galvanized, standard-weight steel pipe with grooved ends, grooved-end fittings, grooved-end-pipe couplings, and grooved joints.
- B. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.
- C. Copper-tube, extruded-tee connections may be used for tee branches in copper tubing instead of specified copper fittings. Branch-connection joints must be brazed.
- D. Standard-pressure, wet-pipe sprinkler system, NPS 2 and smaller, shall be one of the following:
  - 1. Standard-weight or Schedule 30, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
  - 2. Standard-weight or Schedule 30, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
  - 3. Standard-weight or Schedule 30, black-steel pipe with plain ends; uncoated, plain-end-pipe fittings; and twist-locked joints.
  - 4. Standard-weight or Schedule 30, galvanized-steel pipe with plain ends; galvanized, plain-end-pipe fittings; and twist-locked joints.
  - 5. Standard-weight or Schedule 30, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

- 6. Standard-weight or Schedule 30, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
- 7. Standard-weight or Schedule 30, black-steel pipe with plain ends; steel welding fittings; and welded joints.
- 8. Thinwall Schedule 10 nonstandard OD, thinwall or hybrid black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
- 9. Thinwall Schedule 10 or hybrid black-steel pipe with plain ends; uncoated, plain-end-pipe fittings; and twist-locked joints.
- 10. Thinwall Schedule 10 nonstandard OD, thinwall or hybrid black-steel pipe with plain ends; welding fittings; and welded joints.
- 11. Type L, hard copper tube with plain ends; cast- or wrought-copper, solder-joint fittings; and brazed joints.
- 12. Type L, hard copper tube with plain ends; copper pressure-seal fittings; and pressure-sealed joints.
- 13. NPS 2, Type L, hard copper tube with roll-grooved ends; copper, grooved-end fittings; grooved-end-tube couplings; and grooved joints.
- E. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2 to NPS 4, shall be one of the following:
  - 1. Standard-weight or Schedule 30, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
  - 2. Standard-weight or Schedule 30, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
  - 3. Standard-weight or Schedule 30, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
  - 4. Standard-weight or Schedule 30, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
  - 5. Standard-weight or Schedule 30, black-steel pipe with plain ends; steel welding fittings; and welded joints.
  - 6. Thinwall Schedule 10 nonstandard OD, thinwall or hybrid black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
  - 7. Thinwall Schedule 10 nonstandard OD, thinwall or hybrid black-steel pipe with plain ends; welding fittings; and welded joints.
  - 8. Type L, hard copper tube with plain ends; cast- or wrought-copper, solder-joint fittings; and brazed joints.
  - 9. Type L, hard copper tube with plain ends; copper pressure-seal fittings; and pressure-sealed joints.
  - 10. Type L, hard copper tube with roll-grooved ends; copper, grooved-end fittings; grooved-end-tube couplings; and grooved joints.
- F. Standard-pressure, wet-pipe sprinkler system, NPS 5 and larger, shall be one of the following:
  - 1. Standard-weight or Schedule 30, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
  - 2. Standard-weight or Schedule 30, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.

- 3. Standard-weight or Schedule 30, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
- 4. Standard-weight or Schedule 30, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
- 5. Standard-weight or Schedule 30, black-steel pipe with plain ends; steel welding fittings; and welded joints.
- 6. Thinwall Schedule 10 or hybrid black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
- 7. Thinwall Schedule 10 or hybrid black-steel pipe with plain ends; welding fittings; and welded joints.
- 8. Type L, hard copper tube with plain ends; cast- or wrought-copper, solder-joint fittings; and brazed joints.
- 9. Type L, hard copper tube with roll-grooved ends; copper, grooved-end fittings; grooved-end-tube couplings; and grooved joints.

#### 3.14 SPRINKLER SCHEDULE

- A. Use sprinkler types in subparagraphs below for the following applications:
  - 1. Rooms without Ceilings: Upright sprinklers.
  - 2. Rooms with Suspended Ceilings: Concealed sprinklers.
  - 3. Wall Mounting: Sidewall sprinklers.
  - 4. Spaces Subject to Freezing: Upright, pendent, dry sprinklers; and sidewall, dry sprinklers as indicated.
  - 5. Special Applications: Extended-coverage, flow-control, and quick-response sprinklers where indicated Attic sprinklers Combustible concealed space sprinklers.
- B. Provide sprinkler types in subparagraphs below with finishes indicated.
  - 1. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
  - 2. Flush Sprinklers: Bright chrome, with painted white escutcheon.
  - 3. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
  - 4. Residential Sprinklers: Dull chrome.
  - 5. Upright Pendent and Sidewall Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view; wax coated where exposed to acids, chemicals, or other corrosive fumes.

#### END OF SECTION