



ADDENDUM NO. 02

Date: 29 August 2024

To: ALL BIDDERS OF RECORD

From: Frankfurt-Short-Bruza Associates, P.C.
5801 N. Broadway Ext., Suite 500
Oklahoma City, OK 73118

Subject: KELL169014: Construct Corrosion Control Facility, TX/ANG, JBSA Lackland, San Antonio, TX

FSB Project No.: 20190320

NOTE: This Addendum forms a part of the Contract Documents and modifies the Original Documents dated 2 August 2024. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

ATTACHMENTS

Items in this addendum take precedence over the original bid documents. Items not specifically revised remain in effect. This addendum consists of (1) pages and the following attachments:

Specifications:

08 34 16.10 – HORIZONTAL ROLLING STEEL DOORS

Drawings:

A-603 – GLAZING SCHEDULE

MODIFICATIONS TO THE SPECIFICATIONS

ITEM 01.1-1 Refer to attached Specification Section 08 34 16.10 – HORIZONTAL ROLLING STEEL DOORS, dated 29 August 2024:

- A. Specification Section 08 34 16.10 is hereby **revised and re-issued** in its entirety to revise the door type from floating group to Anchored Group doors. Additional specification updates are included and noted.
 - Replace Section 08 34 16.10 dated 2 August 2024 with attached revised Specification Section 08 34 16.10 dated 29 August 2024.

MODIFICATIONS TO THE DRAWINGS

ITEM 01.2-1 Refer to attached Sheet A-603 – GLAZING SCHEDULE, dated 29 August 2024:

- A. Sheet A-603 is hereby **revised and re-issued** in its entirety to revise keynote 1.
 - Replace Sheet A-603 dated 2 August 2024 with attached revised Sheet A-603 dated 29 August 2024.

SECTION 08 34 16.10
HORIZONTAL ROLLING STEEL DOORS
11/21

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.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

- AISC 325 (2017) Steel Construction Manual
AISC 360 (2016) Specification for Structural Steel Buildings

AMERICAN IRON AND STEEL INSTITUTE (AISI)

- AISI SG03-3 (2002; Suppl 2001-2004; R 2008)
Cold-Formed Steel Design Manual Set

AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (ASNT)

- ANSI/ASNT CP-189 (2020) ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

- ASCE 7-16 (2017; Errata 2018; Supp 1 2018) Minimum Design Loads and Associated Criteria for Buildings and Other Structures

AMERICAN WELDING SOCIETY (AWS)

- AWS D1.1/D1.1M (2020; Errata 1 2021) Structural Welding Code - Steel
AWS D1.8/D1.8M (2016) Structural Welding Code-Seismic Supplement

ASTM INTERNATIONAL (ASTM)

- ASTM A36/A36M (2019) Standard Specification for Carbon Structural Steel
ASTM A123/A123M (2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A325 (2014) Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

ASTM A449	(2014; R 2020) Standard Specification for Hex Cap Screws, Bolts, and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
ASTM A653/A653M	(2023) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A1008/A1008M	(2023) 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
ASTM A1011/A1011M	(2023) 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
ASTM C920	(2018) Standard Specification for Elastomeric Joint Sealants
ASTM E84	(2023) Standard Test Method for Surface Burning Characteristics of Building Materials

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 1	(2022) Standard for Industrial Control and Systems: General Requirements
NEMA ICS 2	(2000; R 2020) Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated 600 V
NEMA ICS 6	(1993; R 2016) Industrial Control and Systems: Enclosures
NEMA MG 1	(2021) Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2023; ERTA 7 2023; TIA 23-15) National Electrical Code
NFPA 220	(2024) Standard on Types of Building Construction
NFPA 409	(2022) Standard on Aircraft Hangars

U.S. DEPARTMENT OF DEFENSE (DOD)

MIL-R-5001	(1992, Rev B) Rubber Cellular Sheet, Molded And Hand-Built Shapes; Latex Foam
MIL-STD-889	(2021; Rev D) Galvanic Compatibility of

Electrically Conductive Materials

UFC 1-200-01	(2022; with Change 3, 2024) DoD Building Code
UFC 3-101-01	(2020; with Change 4, 2024) Architecture
UFC 3-301-01	(2023; with Change 1, 2023) Structural Engineering
UFC 4-010-06	(2023) Cybersecurity of Facility-Related Control Systems

UNDERWRITERS LABORATORIES (UL)

UL 489	(2016; Rev 2019) UL Standard for Safety Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
UL 506	(2017; Reprint Jan 2022) UL Standard for Safety Specialty Transformers

1.2 SUBMITTALS

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Manufacturer's Qualifications; G

Installer's Qualifications; G

SD-02 Shop Drawings sealed by the Door Manufacturer's Registered Professional Engineer

Horizontal Rolling Steel Doors; G

SD-05 Design Data sealed by the Door Manufacturer's Registered Professional Engineer

Horizontal Rolling Steel Doors; G

Door Compliance Matrix; G

SD-10 Operation and Maintenance Data

Horizontal Rolling Steel Doors, Data Package 2; G

1.3 DESIGN REQUIREMENTS

1.3.1 Door Design and Components

The Horizontal Rolling Steel Door system described in the construction documents are representative of a commercially available door. Design and provide the door to fit within the space allocated and in accordance with the criteria specified herein. Design doors to operate properly without

binding, interference, or damage to weather stripping or the adjacent structure. Door must be of limited combustible construction in accordance with NFPA 220 and NFPA 409.

Submit Calculations sealed by the door manufacturer's registered professional engineer for review.

Submit drawings showing details of construction, installation, and operation; size, shapes, and thickness of materials; joints and connections; reinforcing; hardware; mechanical devices; electrical devices; and design and detail data for work of other trades affected by these door system(s).

Submit a Door Compliance Matrix which references each specification requirement and the corresponding document and page number where compliance may be verified by the reviewer.

1.3.1.1 Steel Door Components

Design all supporting, steel bracing and framing steel members in accordance with the specified loads and the requirements of AISC 325 and AISC 360. Design all cold formed steel in accordance with AISI SG03-3. Weld steel in accordance with the AWS D1.1/D1.1M Standards.

1.3.2 Loads

Design the door for the loads in accordance with UFC 1-200-01, UFC 3-301-01 and all other applicable criteria.

1.3.2.1 Wind Loads

In the closed position, design the entire door system to withstand the component and cladding wind pressures as indicated by the Engineer of Record for a Partially Enclosed building, based upon the indicated design wind velocity, geometry and other factors. Design all elements of the door's components and cladding to withstand both the highest positive and negative pressures based upon the actual tributary area from the wind, as indicated.

In addition, design the entire door system to be both fully open and fully operational for wind velocities up to 77 mph. Calculate the applicable component and cladding wind pressures, including importance factor, and utilize the controlling wind pressures or utilize a positive and negative wind pressure of 15 psf on the surface of the door, whichever is greater.

Submit complete Calculations sealed by the door manufacturer's registered professional engineer for review.

1.3.3 Deflections

For any door member, the deflection due to design wind load shall not exceed the member's length divided by 120.

Design Doors as a system to withstand a minimum of 150 percent of both the upward and downward deflections of the door header structure, or as recommended by the door manufacturer. The total anticipated service level maximum vertical deflections which may be experienced during the life of the door and building are 3 inches upwards and 6 inches downwards.

For cantilevered truss structures, the camber to accommodate anticipated deadload is 6 inches downward.

Submit design drawings and structural including detail drawings to accommodate deflections described.

1.3.4 Door Structure and Connections

Design connections at top and bottom guide rails to withstand both the positive and negative design wind pressures and seismic loads and blast loads as required by the construction documents. Utilize the governing design loads in accordance with ASCE 7-16 load combinations.

1.3.5 Primary and Secondary Door Members and Connections

Design primary door members and their connections with hot-rolled steel members only. Design complete vertical and lateral load paths, including interconnection system load path from pickup bracket or cable system through the door bracing, to both the top and bottom door leaf members.

Pick Up Brackets for group doors: Connection of the bracket to the door will not use the torsion resistance of the frame to resist loading.

1.3.6 Wind Girt Members and Connections

Cold-formed members are not permitted for use in primary or secondary (main) framing of the door leaf and bracing. In addition, face skin finish materials cannot be utilized as part of the lateral force resisting system, including diaphragm action.

Door manufacturer may utilize cold-formed steel infill members as wind girts to support the cladding. If utilized, cold-formed members may be not be thinner than 14 GA in material thickness.

1.3.7 Cybersecurity

Design all control systems (including systems separate from a utility monitoring and control system) in accordance with UFC 4-010-06 and as required by Section 25 05 11.01 CYBERSECURITY FOR LOW IMPACT HVAC CONTROL SYSTEMS, 25 05 11.02 CYBERSECURITY FOR LOW IMPACT LIGHTING CONTROL SYSTEMS AND 25 05 11.04 CYBERSECURITY FOR MODERATE IMPACT FIRE PROTECTION CONTROL SYSTEMS. Implement cybersecurity requirements to mitigate vulnerabilities to all facility-related control systems.

1.4 QUALITY ASSURANCE

1.4.1 Manufacturer's Qualifications

Use a horizontal rolling steel door product from a manufacturer who is regularly engaged in the design, fabrication, erection, and service of horizontal rolling steel doors of type, complexity, and size required for this project. The manufacturer must have at least 5 years of similar horizontal rolling steel door design experience. Similar doors must have comparable function and design including size, configuration, type of use, retractable or moving elements, safety features, controls, and other key engineering elements as the door being specified. It is acceptable to show that a series of similar doors collectively meet all comparable elements to the door being specified, although not necessarily individually. Manufacturer must submit written evidence on similar past

door designs and installations listing the name, location, contact information of owners, installation dates, overall sizes, features, and other relevant information for experience and qualifications evaluation. Only manufacturers who can submit this evidence of actual installations where the products have proven practical, durable, and require a minimum of maintenance, will be qualified under this specification.

1.4.2 Installer's Qualifications

A manufacturer's representative, skilled and experienced in the erection of horizontal rolling steel steel doors of the type specified herein, is required to supervise installation of the door system(s) in accordance with approved shop drawings. For each installer submit written evidence of similar past door installations listing the name, locations, contact information of owners, installation dates, overall sizes, features, and other relevant information for experience and qualifications evaluation.

1.4.3 Warranty

Provide a three-year warranty for all mechanical and electrical components against defects in material and workmanship beginning on the date of Project Acceptance.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver materials which are not shop installed on the doors in original rolls, packages, containers, boxes, or crates bearing the manufacturer's name, brand, and model number. Store materials and equipment in dry locations with adequate ventilation, free from dust and water, and so as to permit access for inspection and handling. Handle doors carefully to prevent damage. Remove damaged items that cannot be restored to like-new condition and provide new items.

PART 2 PRODUCTS

2.1 HORIZONTAL ROLLING STEEL DOORS

2.1.1 Structural Steel

AISC 360 and ASTM A36/A36M.

2.1.2 Formed Steel

AISI SG03-3.

2.1.3 Galvanized Steel

Hot dipped galvanized frames in accordance with ASTM A123/A123M.

2.1.4 Sheet Steel

ASTM A1011/A1011M hot-rolled steel sheet, commercial quality,
ASTM A1008/A1008M cold-rolled steel sheet, commercial quality.

2.1.5 Galvanized Sheet Steel

ASTM A653/A653M, coating designation G 90 galvanized steel sheet, commercial quality.

2.1.6 Exterior Covering

Insulated Metal Wall Panels as specified in Section 07 42 63 FABRICATED WALL PANEL ASSEMBLIES.

2.1.7 Interior Covering

Preformed metal liner panel is specified in Section 07 42 63 FABRICATED WALL PANEL ASSEMBLIES with factory finish equal to the manufacturer's standard PVDF fluoropolymer. Provide interior panel full height of door.

2.1.8 Exterior Envelope

2.1.8.1 Insulation

Provide insulation that:

- a. Contains no asbestos;
- b. Is permanently secured in place behind the exterior covering; and
- c. Has a flame spread rating of 75 or less and a smoke-developed rating of 100 or less when tested in accordance with ASTM E84.

Do not use cellular plastics as exposed finish material. Design the doors to have an air-to-air U value of not more than and a sound transmission class (STC) of not less than .

Batt or blanket insulation as specified in Section 07 21 16 MINERAL FIBER BLANKET INSULATION.

Submit design drawings and U value calculations.

2.1.8.1.1 Air Barrier

The door manufacturer is responsible for the delegated requirement to design, provide and inspect the door cladding portion of the Air Barrier in accordance with UFC 3-101-01.

- a. When the door system is fully open, all door system components will be outside of the required clearance area for the door opening.
- b. When the door system is fully closed the door system will seal and form a portion of the building's exterior envelope.

The door manufacturer is responsible for the delegated requirement to design, provide and inspect the door flashings and weather stripping for their ability to seal to form a portion of the Air Barrier in accordance with UFC 3-101-01.

2.1.9 Hardware

Provide door hardware to accommodate all design loads specified. Provide top guide rollers, bottom wheels, interleaf bumpers, tractor pulls, track cleaners, and top bumpers as required for a complete and operational installation.

2.1.9.1 Wheel Assemblies

Provide steel plate bottom wheels having a minimum tread diameter as required for the actual wheel loading. Construct wheel assemblies to permit removal of the wheel without removing the door leaf from its position on the rail.

- a. Treads: Machine wheel treads concentric with bearing seats. The clear distance between flanges not exceeding the width of the rail by more than 1/8 inch at the tread nor more than 1/4 inch at the edge of the flange. Machine internal bearing seats accurately for a press fit. Heat treat wheels 18 inches or greater in diameter to obtain a rim hardness of 320 Brinell.
- b. Wheel bearings: Provide tapered roller or spherical bearings, either internal or cartridge type, arranged so that both horizontal and vertical loads are transferred to the rail only through the bearing. Provide bearings tightly sealed and equipped with high-pressure grease fittings.

2.1.9.2 Top Guide Rollers

Provide top guide rollers of suitable size and capacity for satisfactory performance under the design load conditions. In addition, provide the top guide roller type matching the top guide system to be used.

~~2.1.9.2.1 Fixed Pancake Top Guide Rollers~~

~~Horizontal type; to be used between two vertical steel surfaces formed by the top guide system. Provide adequate clearance for vertical deflection of top guide system. Provide rollers not allowing more than 1/4 inch of side to side movement of the door. Provide guide heads each with single or double steel rollers of a suitable diameter and thickness for satisfactory performance under the designated load conditions and top guide system used. Provide permanently lubricated bearings. Design doors to use no less than two top guide heads. Use fixed type head flashing when providing fixed pancake top guide rollers.~~

2.1.9.2.2 Vertical Floating Head Top Guide Rollers

Provide top-roller assemblies to:

- a. Move up and down within the specified positive and negative deflection of the roof in the vicinity of the door opening;
- b. Allow easy removal through the top of the guide system; and
- c. Include both horizontal and vertical rollers built into a frame which is connected in such a manner as to transmit the specified wind loads from the door to the building structure and to prevent disengagement of the door from the top guide; and
- d. Provide vertical floating head top guide rollers that use floating type head.

2.1.10 Personnel Doors

Personnel doors are not required within these Hangar doors.

The door manufacturer is responsible for providing structural frames and electrical interlock for personnel doors.

2.1.10.1 Doors and Frames

Specified in Section 08 11 13 STEEL DOORS AND FRAMES.

2.1.10.2 Hardware for Personnel Doors

Specified in Section 08 71 00 DOOR HARDWARE.

2.1.10.3 Electrical Interlock

Provide each personnel door with an electrical interlock switch to prevent motor operation of the leaf or group in which it is located when the personnel door is open. Provide an identified indicator light at each door leaf control station indicating when the personnel door is in the open position. The intent of this requirement is to prevent any other door leaf from bypassing the door leaf with an open personnel door.

2.1.11 Weather Stripping

Provide adjustable and readily replaceable material. Provide on vertical edges, sills, and heads to afford a weathertight installation. Weather stripping is bulb type.

Provide minimum double edge weather stripping between door leaf panels.

2.1.11.1 Rubber

Provide flexible weather stripping on vertical edges and sills. Provide clearance between metal parts on vertical edges of leaves and between leaves and jambs which are to be weather-stripped as indicated, or a minimum of 2 inches whichever is greater. Use either flap-type, two-ply, EPDM or double flap, single or dual opposed solid neoprene material.

For flap-type weather stripping, provide a two-ply cloth-inserted EPDM material with a minimum thickness of 1/8 inch and retained continuously for its full length and secured with rust-resistant fasteners spaced no more than 12 inches on center.

For double flap weather stripping, provide extruded neoprene with heavy center section attached at 12 inches on center.

2.1.11.2 Metallic

Form head weather stripping material between each leaf and the top guide system of not thinner than 18 gage galvanized sheet steel or flap-type, cloth-inserted neoprene, as indicated.

2.1.11.3 Head Flashing

Provide with the top guide system specified in Section 05 12 00 STRUCTURAL STEEL. Provide cloth-inserted neoprene weathering fastened to top of door leaves to engage the head flashing when doors are closed. Head flashing type is dictated by top guide system and top guide head type.

2.1.11.3.1 Hanging Head Flashing

Provide head flashing secured to top guide structure so as not to obstruct path of door movement.

2.1.11.3.2 Floating Head Flashing

Provide head flashing secured to top guide heads and travel with the guide heads as the guide system deflects under live load. Provide adequate clearance such that when the floating flashing moves, it does not crash into the door structure.

2.1.11.3.3 Fixed Head Flashing

Provide head flashing secured to the door structure and extending vertically upward until it creates an overlapping seal with the top guide structure. Select dimensions such that the top guide roller will contact the guide structure before the head flashing so that it does not drag during operation.

2.1.12 Fasteners

Fasteners are selected by the hangar door manufacturer in order to develop the full strength of the connection required. Bolted structural connections require ASTM A325 or ASTM A449 bolts. Bolt finish is zinc plated.

2.1.13 Sealant

Single-component or multicomponent elastomeric type conforming to ASTM C920, Type S or M, Grade NS, Class 12.5, Use NT. Provide a sealant that has been tested on the types of substrate to which it will be applied.

2.1.14 Primer

Zinc-Rich Epoxy Primer in accordance with Section 09 96 00 HIGH-PERFORMANCE COATINGS.

2.1.15 Variable Frequency Drives

Provide a variable frequency drive (VFD) in NEMA ICS 1, Type 4 enclosures equipped with access door-controlled, UL 489 Molded Case Circuit Breaker (MCCB) with a through-the-door disconnect switch. The control system includes but is not limited to a VFD equipped with overload and undervoltage protection, relays and timing devices as required, control circuit transformers, and a numbered terminal strip. Provide a control circuit transformer capable of reducing the voltage in the control circuits to 120 volts or less, and conforms to UL 506.

2.1.16 Electrical

Provide conduit, wire, flexible cables, boxes, devices, and accessories, and install trolley duct, under Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. If permanent electrical power is not available when door installation is complete, provide temporary power in accordance with distribution system requirements in Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM, for testing and adjusting the doors.

Submit the door manufacturer's complete schematic wiring diagram, field

wiring diagram, and a complete physical location drawing showing the location of controls with the runs of conduit, size of conduit, number and size of wires in each conduit, location of junction boxes, and full details of control mountings.

2.1.16.1 Electrical Classification

This building and these doors are required to adhere to a Class 1 Division \pm 2 electrical classification to a height of 18 inches feet as shown in the Contract Drawings.

2.2 FABRICATION

2.2.1 Doors

2.2.1.1 Frames and Framing

Provide welded or bolted construction in door leaves. Design joints to develop 100 percent of the strength of the framing members. Provide continuous vertical members throughout the height of the door. When required, prepare splices to facilitate field assembly in accordance with standard practice. Provide frames and framing members true to dimensions and square in all directions; no bowed leaves, warped, or out of line in the vertical or horizontal plane of the door opening by more than 1/8 inch in 20 feet. Provide diagonal bracing so that the completed leaf assembly will be braced to withstand shipping, assembly, and operational loads. Grind smooth any exposed welds and welds which interfere with the installation of various parts such as cover sheets. Prepare, prime, and coat structural framing and miscellaneous steel as specified in the paragraph FINISHES.

2.2.1.2 Exterior Covering and Interior Liner Sheets

Fasten flat sheets to the frame either by edge welding, plug welding, or threaded fasteners at no greater than 12 inches on center. The maximum area where flat sheets are attached as either exterior covering or interior liner sheets cannot exceed 25 square feet. Make edges of exterior sheets weathertight with sealant.

2.2.2 Locking Devices

Do not provide locking devices on motor-operated doors.

2.2.3 Tractor Pulls

Provide tractor pulls so that leaves can be towed by a tractor or similar equipment in the event of power failure. Design the tractor pull for drive force to tow door or 5000 pounds whichever is greater. Provide a minimum 3/8 inch thickness steel plate.

2.2.4 Track Cleaners

Provide a device to clear debris from the rail head and wheel flange grooves as the leaf is moved.

2.2.5 Insulation

Secure insulation to doors with clips, studs, or adhesive. Protect insulation within 8 feet of floor with steel liner sheets secured to

framing 12 inches on center at edges with hot dipped galvanized, self-tapping screws.

2.2.6 Interconnection of Door Leaves

2.2.6.1 Cable System for Group Doors

The minimum size for the cable which interconnects the leaves is 3/8 inch; provide cables containing either improved plow steel with lubricated hemp centers or wire rope cores. Sheaves over which the cables operate have a diameter of at least 18 cable diameters and either sealed ball- or roller-type bearings or graphite bronze bearings of a sufficient capacity for the operating loads. Grease fittings are provided for the sheave bearings unless permanently lubricated bearings are used. Operate cable sheave systems such that the lead door travels at 60 feet per minute.

2.3 OPERATION

2.3.1 Door Types

Provide ~~unidirectional as indicated door type~~. Provide ~~Floating Group Anchored Group doors~~. ~~Floating Group doors are interconnected by cable sheaves~~. **Anchored Group doors are interconnected by cable sheaves.**

2.3.1.1 Anchored Group Doors

Provide a traction-drive operating unit located in the lead leaf of the group and driving one or more wheels of the lead leaf. If connected by cable sheaves, design the leaves in each group to start to moving at the same time and arrive at their fully open or fully closed positions simultaneously. Provide necessary cables, fittings, sheaves, housings, guards, anchors, and miscellaneous hardware. Provide doors that require operating personnel to walk with the leaf as it moves. See operator requirements for cable sheave doors.

2.3.1.1.1 Push Buttons for Anchored Group Doors

Each group is controlled by a two-button push button station marked "OPEN" and "CLOSE" mounted near the inside leading edge of the lead leaf.

2.3.1.1.2 Lever Arm Type Limit Switches

Provide for anchored group doors to stop the travel of each group in the fully open and fully closed positions. Provide limit switches with:

- a. Positive acting, snap action, lever arm type with actuating cams designed with sufficient overtravel to permit the group to come to a complete stop without over traveling the limit switches.
- b. Mounted on the leaves, and the actuating cams mounted either on the top guides or on adjacent door leaves.

2.3.1.1.3 Safety Edges

Provide fail-safe safety edges on the leading edge of the drive leaf of anchored group doors.

2.3.1.1.4 Warning Device

Provide a clearly audible signal and clearly visible LED flashing light on each group of leaves.

2.3.2 Operating Units

Design each operating unit to move its lead leaf at a speed of approximately 60 feet per minute at zero wind load conditions. Design the operating units to consist of either a separate motor and gear reducer or a gearhead motor, high-speed shaft brake, and necessary roller chains and sprockets. Provide the systems with overload protection for the drive units and a means for emergency tractor towing operation.

- a. Provide NEMA MG 1, high-starting torque, reversible type motors with sufficient horsepower and torque output to operate the leaves in either direction from any position under zero wind load conditions at not more than 75 percent of their rated capacity. Motors shall operate on current voltage of the characteristics indicated at not more than 3600 rpm. Provide drip-proof type motor enclosures or NEMA totally-enclosed, fan-cooled (TEFC) type. Design motors using a minimum service factor of 1.2.
- b. Provide gear reduction units that allow a reversal of effort through the gears without damage to the units.
- c. Provide operating mechanisms covered on the interior of the leaf by a hinged 16 gage flat steel cover.

2.3.3 Braking Systems

Design braking systems to ensure stoppage of the leaves under normal, dry rail conditions within the safety edge overtravel limit. Provide either a magnetic, spring-set, solenoid-released brake or hydraulic type braking systems. Provide a hand release to release the brake when it becomes necessary to move the leaf with an outside force. Provide an automatic reset type hand release so that the brake will be operable during subsequent electrical operation of the door.

2.3.4 Controls

Provide doors controlled by constant pressure push buttons mounted on the door leaves. Removing pressure from the button shall stop the movement of the leaves. Provide control equipment conforming to NEMA ICS 1 and NEMA ICS 2. Provide mushroom head type interior push buttons, mounted in heavy-duty, oil-tight enclosures conforming to NEMA ICS 6, Type 4, except that enclosure for the VFD with disconnect switch requires Type 12 for interior application. Provide watertight enclosures for exterior push buttons conforming to NEMA ICS 6, Type 4.

2.3.5 Limit Switches

Provide limit switches to prevent overtravel and bumping. Safety edges are not to be used as limit switches.

Submit in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA. Include wiring and control diagrams.

2.3.6 Safety Edges

Provide fail-safe safety edges on door leaves from one inch above the floor to the top of the door leaf. For leaves 12 inches thick (including siding) or less, provide a single run of safety edge the full width of door. For leaves over 12 inches thick (including siding,) provide a double run of safety edge spaced to provide the maximum degree of safety in stopping the leaves. For leaves over 12 inches thick (including siding) provide a double run of safety edges on the outer edge of each side of door leaf covering no less than 80 percent of leaf.

- a. Design: Provide safety edges to provide a minimum of 3-1/2 inches of overtravel after actuation until solid resistance is met and door motion comes to a complete stop. If door requires more than 3-1/2 inches to come to a complete stop, provide additional overtravel built into safety edge the distance required for door motion to come to a complete stop. Use pneumatic or electric safety edges.
- b. Specs: Use sensing edges of reinforced polyvinyl chloride cover or other Government-approved material with chemical resistance to diesel and JP-4 fuel, hydraulic fluids, SAE-30 oil and salt water. Use cover that provides hermetic seal for weather and moisture resistant protection of internal foam and contact elements. Internal foam may be polyurethane and/or latex foam in accordance with military specification MIL-R-5001, medium density. Use natural gum rubber hose, plugged on one end or other Government -approved materials and design to perform the switching function when the sensing edge encounters an obstruction along any portion of its active length.
- c. Operation: Verify that actuation of the safety edge on leading edge of a group of leaves stops movement of the group. Actuation of a safety edge locks out the motor control in the direction of travel until reset, but shall permit the door to be reversed away from the obstruction which tripped the safety edge. Design safety edges to reset by moving doors away from the obstruction. Design the lower portion of the safety edges to a height of approximately 5 feet to be independently removable for convenience in servicing or repair. The remainder of the edge may be in one piece up to a maximum of 20 feet.
- d. Door Edge Protection
 - (1) Bumper(s): Protect each door leaf edge provided with a safety edge with a spring type bumper(s). Design bumper to absorb 150 percent of the door drive force when door is pushed in an emergency. For continuous safety edges, extend bumpers to the sides. For sectional safety edges, the bumper can interrupt the safety edge for a distance not greater than 12 inches.
 - (2) Tow Bar(s): Provide rigid tow bar for each door leaf edge provided with a safety edge. Design rigid tow bar assembly for 150 percent of the door drive force when door is pushed or pulled in an emergency. Provide swivel connection at door end and hook pintle hitch at opposite end.
- e. Keyed bypass: Provide a keyed bypass to the door controls to render the safety edges in a temporary "repair" mode, if necessary. The door drive shall be restored from its "fail safe" mode by activation of the keyed bypass.

2.3.6.1 Electrical Safety Edges

Connect the safety edge in series with the necessary relays and resistors to make the system complete. The service shall be not more than 24 volts and the circuit shall be normally energized so that the malfunction of any of the component parts will make the door inoperative. Wire sensing edges to provide for control reliable 4-wire operation of door so that any power loss to the sensing edges is experienced, then the door becomes inoperable until power is restored and a reset operation is initiated. Install sensing edges to operate through a normally energized relay so that when the sensing edge is compressed the relay contacts open. Install relay contacts to also open if any component in the sensing edge control circuit is broken so as to break continuity. Use 24 volts electrical service to the control circuit. Ensure service to the sensing edge does not exceed a nominal 24 volts. Install a large red indicator light and/or a loud siren, to be simultaneously activated with the actuation of any sensing edge, to indicate the presence of an obstruction.

2.3.6.2 Pneumatic Safety Edges

Pneumatic safety edges operate by means of displaced air actuating air switches. Provide a minimum of one air switch for each 20 feet of vertical edge. Provide a pneumatic sensing hose utilizing a natural gum rubber with a 3/4 inch inside diameter. Provide electrical service to the air switch no more than 120V. Locate all air switches, associated wire, and conduit above 18 inches minimum above the floor.

2.3.7 Warning Device

Provide warning device that complies to the following:

- a. Operate when the push button is actuated for movement of the door in either direction;
- b. Sound 5 seconds before the door moves, and while the door is moving; and
- c. Be distinctly different than the fire alarm and be a minimum of 100 dB within 30 feet.

2.3.8 Emergency Operation

Provide doors constructed and equipped so that they can be operated-manually or by tractors from the ground level in case of power failure. Design the manual operation of doors to avoid damage to safety edges.

2.3.9 Electrical Work

It is the door manufacturer's responsibility to provide the proper electrical equipment and controls built in accordance with the latest NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6 standards. Provide equipment, control circuits, and safety edge circuits that conform to NFPA 70. Where located 18 inches or less above the floor, meet the requirements to be explosion-proof as defined in NFPA 70, Article 513. Provide manual or automatic control devices necessary for motor operation of the doors, including push button stations, limit switches, variable frequency drive with UL 489 MCCB motor circuit protection, control circuit transformers, relays, timing devices, warning devices, and trolley ducts with collectors

or trolleys .

~~2.3.9.1 Trolley Ducts~~

~~Provide one or more runs of trolley duct as required for the door system provided. Provide ducts with solid copper conductors in a protective steel or polyvinyl chloride housing. Locate ducts as shown on door manufacturer's drawings. Provide adequate clearances in the top guide system for the ducts.~~

- ~~a. Provide each run with the required number of sections of straight track, a section of dropout track, feed boxes, end caps, couplings, hangers, and other accessories to make the system complete and workable. If required, provide expansion tracks in each run where the system crosses a building expansion joint in the roof construction and in the top guides.~~
- ~~b. Furnish one track supported tandem trolley or self supporting collector for each individually motor operated door, complete with spring loaded brush contacts. Provide trolley pulling brackets and corrosion protected chains attached from each side of the pulling bracket to each side of the tandem trolley or support bracket for self supporting collectors.~~

2.3.9.2 Electrical Cables

Provide festoon flexible cables with support system or cable reels with Type SO cable with strain relief connections and support system in accordance with the door manufacturer's approved drawings and wiring diagrams.

2.3.9.3 Door Pocket Safety Device

Provide illuminated push/pull emergency stop button for bi-parting and unidirectional doors at the pockets where the doors stack together.

2.4 FINISHES

2.4.1 Ferrous Metal

Clean, prepare, and coat all exposed and non-exposed ferrous metal surfaces as part of the Section 09 96 00 HIGH-PERFORMANCE COATINGS work, including all requirements, submittals, certifications, testing, and inspections required by Section 09 96 00 HIGH-PERFORMANCE COATINGS. Do not coat finished bearing surfaces. Alternate coating systems or products will not be considered. Prepare surface and apply coatings in the shop, following all temperature, humidity, and testing requirements listed in the Section 09 96 00 HIGH-PERFORMANCE COATINGS. After installation of the door, prep and touch up surfaces damaged during assembly and installation of the door. Prep and coat unfinished ferrous metal accessories such as bolts and brackets.

2.4.2 Factory-Finished Panels

Provide galvanized G90 per ASTM A653/A653M on all factory-finished ferrous metal panels to be exposed to the interior or exterior.

2.5 SIGNAGE

Provide a placard sign immediately adjacent to all control panels explaining how to operate the door and indicating the below notices. The Notice posts the service level wind speed which corresponds to the ultimate wind speed used in design of the open/operational door in paragraph WIND LOADS.

a. Notice:

- (1) Horizontal Rolling Steel Doors must be closed and not operated when wind speeds above 60 mph are expected.

PART 3 EXECUTION

3.1 ERECTION

Provide all work associated with these door systems under the direct supervision and control of the fabricator for safety, control of product liability, and Engineer of Record responsibilities. Coordinate the erection of the doors with the work of other trades. Coordinate the design, fabrication and erection of the door systems and adjust for actual camber, fabrication, and erection tolerances of the surrounding framing. Verify the door system as installed within the erected superstructure accommodates the required upward and downward deflections of the top guide system including required factor of safety. Ensure that all steel support, bracing and framing members are furnished and accurately installed. Coordinate electrical work, including locations of all panels, equipment, motors and other components for required clearances, access and routing of power.

3.1.1 Assembly

Assemble and install the doors and accessories in accordance with the manufacturer's recommendations and installation manual. Provide additional supports as necessary for attachment of guides, brackets, doors, and operation mechanisms. After erection is complete and before touch-up field painting is applied, thoroughly clean all abraded surfaces, field welds, and field bolts; coat in accordance with the paragraph FINISHES.

3.1.2 Cleaning

Clean both the interior and exterior of doors after the completion of erection.

3.1.3 Control Panel Installation

Locate all door control panel indoors, adjacent to the door opening, and with an unobstructed line of sight for the entire door opening. Provide all conduit entries into the bottom of the control panel. Mount control panels and provide three phase power to each control panel.

3.2 PROTECTIVE COATINGS

3.2.1 Cleaning

After fabrication, clean all metal surfaces thoroughly of all mill scale, rust, oil, grease and other foreign substances. Apply rust-preventive

primer to all steel parts immediately after cleaning.

3.2.2 Shop Painting

After cleaning, coat with primer all steel surfaces other than machine-finished parts. Keep paint off finished bearing surfaces. Before assembly, prime surfaces that will be inaccessible after assembly. Handle painted materials with care to avoid scraping and breaking the protective film. Ferrous metal surfaces that will be exposed after fabrication will be shop coated and touch-up painted in the field in accordance with the paragraph FINISHES.

3.2.3 Metal Protection

Provide in accordance with Chapter 4 of UFC 1-200-01 when door system is in a corrosion prone location or where door system components use dissimilar metals. If dissimilar metals are used, also provide in accordance with MIL-STD-889. Provide added corrosion protection to the design such as, but not limited to, the following. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact masonry or concrete, protect against corrosion by painting contact surfaces with bituminous coating.

3.3 WELDS

3.3.1 Visual Inspection

Furnish the services of AWS-certified welding inspectors for fabrication and erection inspection and testing and verification inspections in accordance with AWS D1.1/D1.1M. Perform visual inspections on 100 percent of all welds with a Certified Welding Inspector. Document this inspection in the weld inspection report.

Inspect proper preparation, size, gaging location, and acceptability of all welds; identification marking; operation and current characteristics of welding sets in use.

3.3.2 Nondestructive Testing

Perform nondestructive testing in accordance with AWS D1.1/D1.1M and AWS D1.8/D1.8M. Perform ultrasonic testing in accordance with Table 6.2 of AWS D1.1/D1.1M. Test 50 percent of all welds, with sampling representative of all weld types and locations for the entire door system and for the duration of the fabrication schedule. All personnel performing NDT are required to be certified in accordance with ANSI/ASNT CP-189 in the method of testing being performed. Submit certificates showing compliance with ANSI/ASNT CP-189 for all NDT technicians. If more than 10 percent of welds made by a welder contain defects identified by testing, then all groove welds made by that welder are required to be tested by ultrasonic testing, and all fillet welds made by that welder are required to be inspected by magnetic particle testing (MT) or dye penetrant testing (PT). When groove welds made by an individual welder are required to be tested, magnetic particle or dye penetrant testing may be used only in areas inaccessible to ultrasonic testing. Retest all repaired areas. Submit weld inspection report.

3.4 ELECTRICAL WORK

NFPA 70. Provide all conduit, wiring, and mounting of controls in accordance with Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

Door manufacturer to coordinate with the qualified, licensed electrical contractor who will provide and install all 208 3-phase supply power to all components (such as Main, auxiliary, controllers, panels, motors, etc.) which require this low voltage supply power. The qualified, licensed electrical contractor will provide and install all conduit for the control level power under the review and approval of the door manufacturer. Either the qualified, licensed electrical contractor or a factory authorized technician may provide and install all wiring for control level power under the review and approval of the door manufacturer in accordance with the approved construction submittals.

3.5 ACCEPTANCE TESTING PROCEDURE AND REPORT

Submit an Acceptance Testing Procedure for approval, which includes coordination with Section 01 91 00.15 BUILDING COMMISSIONING for such items as door position switches which interact with HVAC controls. After Government approval, perform the testing and submit a report of the results. Provide acceptance testing for the entire door system, including every component, performed by the door manufacturer and suppliers. The following subparagraphs are included in the acceptance testing.

3.5.1 General

Upon completion of installation, including work by other trades, lubricate, adjust, and test doors to verify operation on accordance with manufacturer's product data. Final adjustments will be made by the manufacturer's authorized representative. Adjust and re-test the doors until the entire installation is fully operational and acceptable. Acceptance testing consists of operating each door open and closed (one cycle) ten times successfully and consecutively within a nine-hour time interval in accordance with manufacturer's recommended time interval between open/close cycles. Provide the Contracting Officer's Representative a copy of the final acceptance testing report with completed tests.

3.6 PERSONNEL TRAINING

Provide a 4-hour on-site training session for the Government's door operating personnel and maintenance. Attendees may include base personnel such as facility users, fire department and others. In the training, outline door safety, normal operation, emergency operation, troubleshooting, maintenance, and repair guidelines.

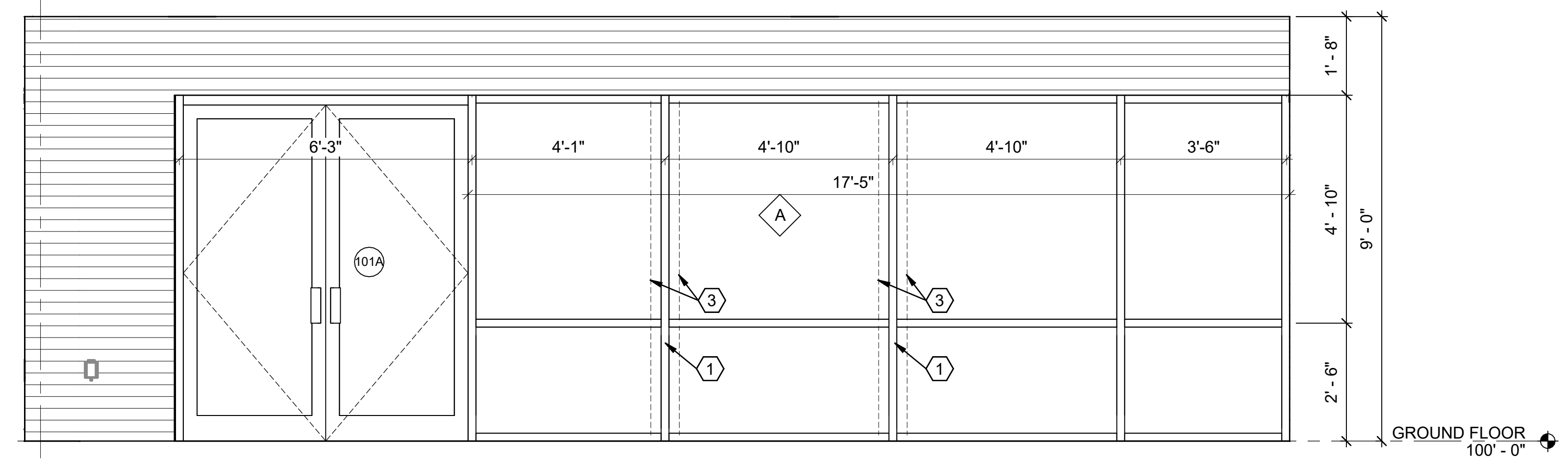
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SHEET KEYNOTES

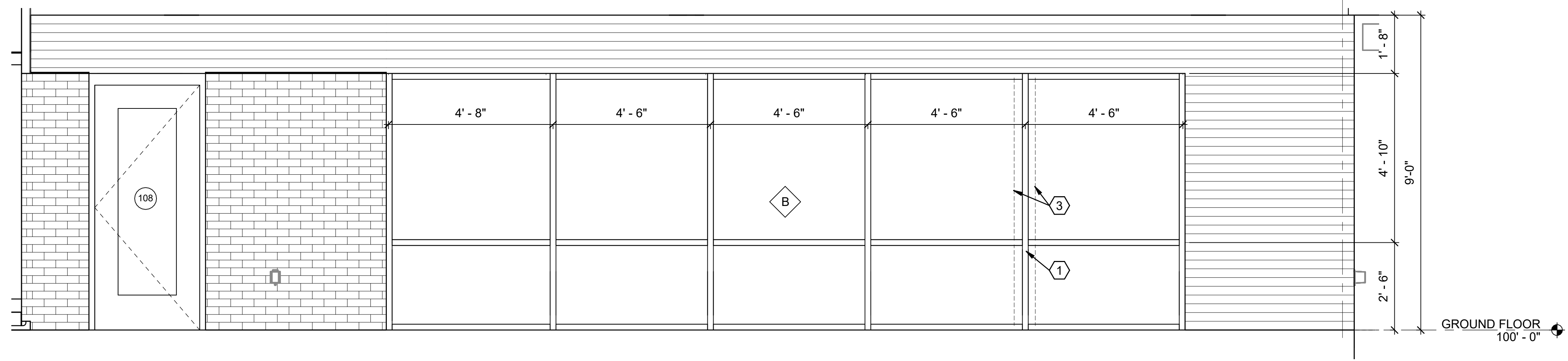
1. ALIGN CENTER OF GLAZING MULLION WITH CENTER OF PARTITION (REF: E5/A-401)
2. FIBERGLASS SANDWICH PANEL ASSEMBLY- BID OPTION NO.1.
3. LINE OF A4 PARTITION BEYOND.

FSB FEDERAL DESIGN GROUP JV

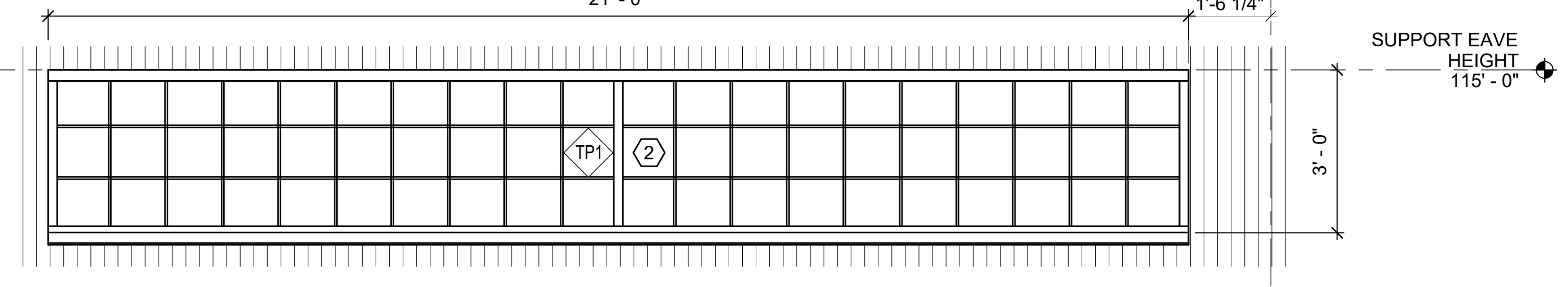
Frankfurt-Short-Bruza Associates, P.C.
5801 Broadway Extension, Suite 500
Oklahoma City, OK 73118-7436
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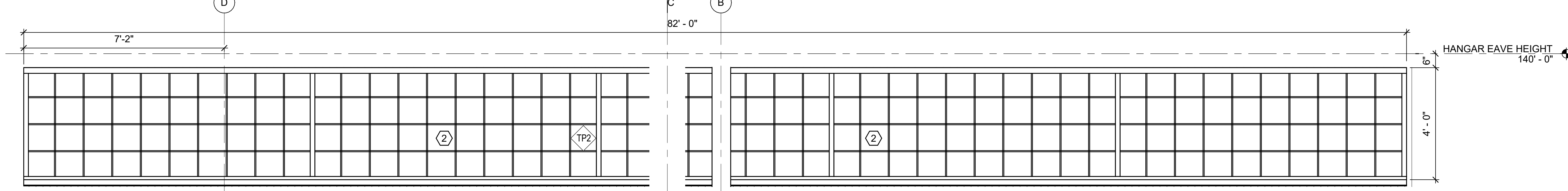
A2 STOREFRONT GLAZING- SOUTH ELEVATION
SCALE: 1/2" = 1'-0"



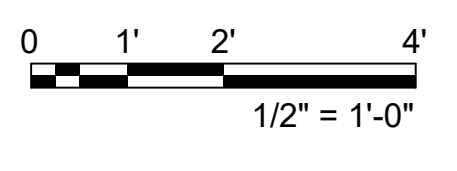
A4 STOREFRONT GLAZING- WEST ELEVATION
SCALE: 1/2" = 1'-0"



A5 TRANSLUCENT PANEL- SOUTH AND NORTH ELEVATIONS - BID OPTION NO.1
SCALE: 1/2" = 1'-0"



A6 TRANSLUCENT PANEL- WEST AND EAST ELEVATIONS - BID OPTION NO.1
SCALE: 1/2" = 1'-0"



Texas Air National Guard - 149th FW
Corrosion Control Facility
TXANG Project Number: KELL 169014
JBSA - Kelly Annex, TX

REVISION HISTORY:

NO.	DESCRIPTION	DATE
2	ADDENDUM 02	08/29/2024

PROJECT INFORMATION:

DESIGNED BY: **JCL**

DRAWN BY: **JCL**

REVIEWED BY: **BKG**

PROJECT MANAGER: **NDM**

PROJECT NUMBER: **20190320**

SHEET TITLE: **GLAZING SCHEDULE**

ISSUE DATE: **2 AUGUST 2024**

SHEET NUMBER: **A-603**

8/29/2024 4:28:33 PM

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