Texas Department of Transportation
125 EAST 11TH STREET | AUSTIN, TEXAS 78701-2483 | (512) 463-8700 | WWW.TXDOT.GOV

ADDENDUM NO. 1

Issue Date: June 4, 2020
By Texas Department of
Transportation Aviation Division

Sugar Land Regional Airport - Rebid

TxDOT CSJ No. 18HGSUGAR

The following revisions and clarifications are to be incorporated into your bid for the above referenced project. Acknowledgment of receipt of this addendum is required on the signature page of the bid form. Failure to acknowledge all addenda could render your bid out of form and result in a non-responsive bid.

TxDOT experienced an outage with the department's computer network. This outage impacted network connectivity including the TxDOT Aviation Division Website, eGrants, and Plans-Online.

The outage affected our ability to receive proposals, provide construction documents needed for bids, or otherwise communicate important information through the Aviation Division website regarding our ongoing procurements

The published bid opening for 18HGSUGAR, Sugar Land Regional Airport has been changed from June 10, 2020 at 2:00 PM to June 18, 2020 at 2:00 PM.

Bids will be addressed and delivered to need to Mr. Thomas Harris III, City Secretary, 2700 Town Center Boulevard North, Suite 122, Sugar Land, Texas, 77479, then publicly opened and read. Any bid received after closing time will be returned unopened.

The bids will be opened and read aloud at the Sugar Land City Hall, Council Chambers, 2700 Town Center Boulevard North, Sugar Land, Texas, 77479. The City of Sugar Land requests that all persons who attend the bid opening in person to practice safe social distancing. In an effort to facilitate practicing safe social distancing, please limit the number of people attending per company due to space restrictions. For persons who will attend the bid opening in person, all persons will have to have their temperature taken prior to being permitted to enter the building. If a person's temperature indicates that they have a fever that person will not be allowed to enter the building. We recommend that if you are attending the bid opening in person to arrive 15-20 minutes prior to the bid opening time. To attend the bid opening via tele-conference, please use the following call-in number and meeting ID. Call-In Number: 209-844-4600. Meeting ID: 24136866

KSA A·DYNAMIC·PERSPECTIVE

Addendum No. 1

To: All Plan Holders

Project: Terminal Apron Hangar Replacement Project

Airport: Sugar Land Regional Airport

KSA Project No.: SG.061E

Date: Thursday, June 4, 2020

Client Project No.: TxDOT CSJ No. 18HGSUGAR-REBID

The plans, specifications, and contract documents are modified as described below. All bidders shall acknowledge receipt of this and all other addenda on page 7 of 8 on the bid form. This addendum becomes a part of the contract documents. All provisions of the original plans, specifications, and contract documents shall remain in full force and effect, except as modified by this addendum.

I. **Plan Revisions**

A. Plan Sheet A2.00, Proposed Elevations Base Bid

1. Add the attached Plan Sheet A2.00, Proposed Elevations Base Bid

B. Plan Sheet A2.01, Proposed Elevations

1. Replace with the attached Revised Plan Sheet A2.01, Proposed Elevations

II. **Specification Revisions**

A. Specification 074213, Insulated Metal Wall Panels

1. Delete this item in its entirety and replace with the attached Specification 074213, Insulated Metal Wall Panels shown as Addendum No. 1 in the header.

B. Specification 074113.16, Standing Seam Metal Roof

1. Add the attached Specification 074113.16, Standing Seam Metal Roof shown as Addendum No. 1 in the header.

III. **Attachments**

A. Plan Sheet A2.00, Proposed Elevations Base Bid

B. Plan Sheet A2.01, Proposed Elevations

C. Specification 074213, Insulated Metal Wall Panels

D. Specification 074113.16, Standing Seam Metal Roof

E. Contractor Questions and Responses

F. Pre-Bid Meeting Agenda

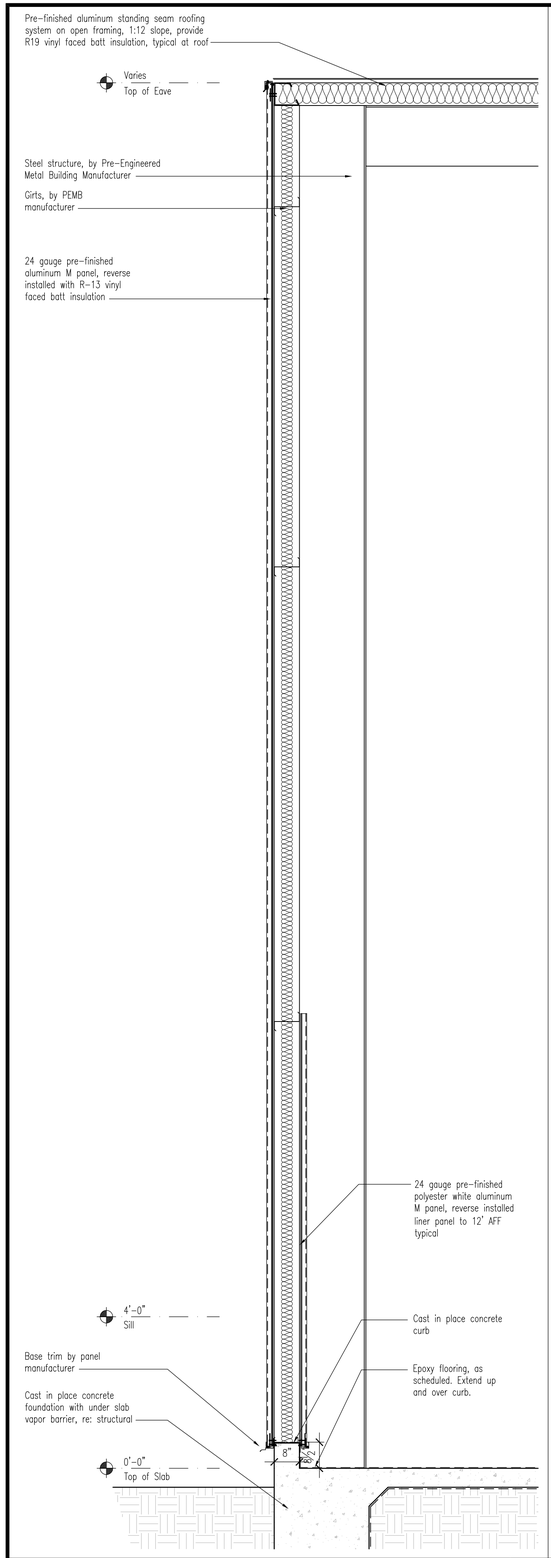
G. Pre-Bid Meeting Sign In

Addendum No. 1 Issued By:
KSA

Nathan T. Mikell, P.E.
Senior Project Engineer

STATE OF TEXAS
NATHAN T. MIKELL
136408
LICENSED
PROFESSIONAL ENGINEER
6/4/2020

TBPE Firm Registration No. F-1356



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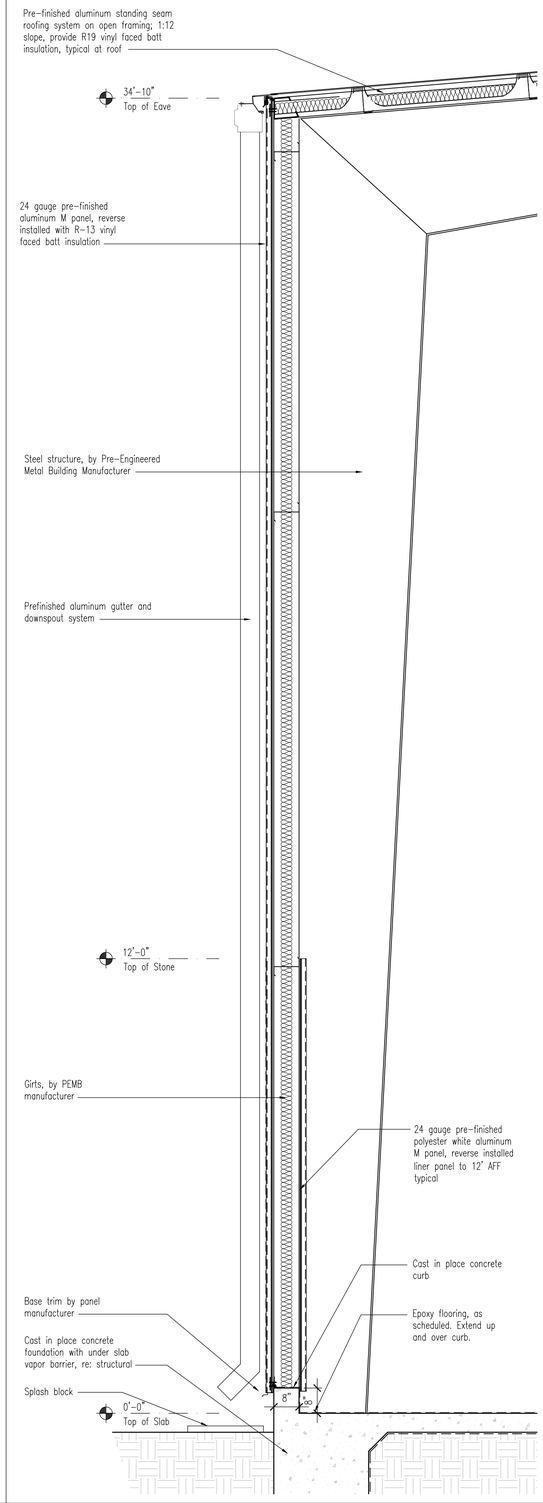

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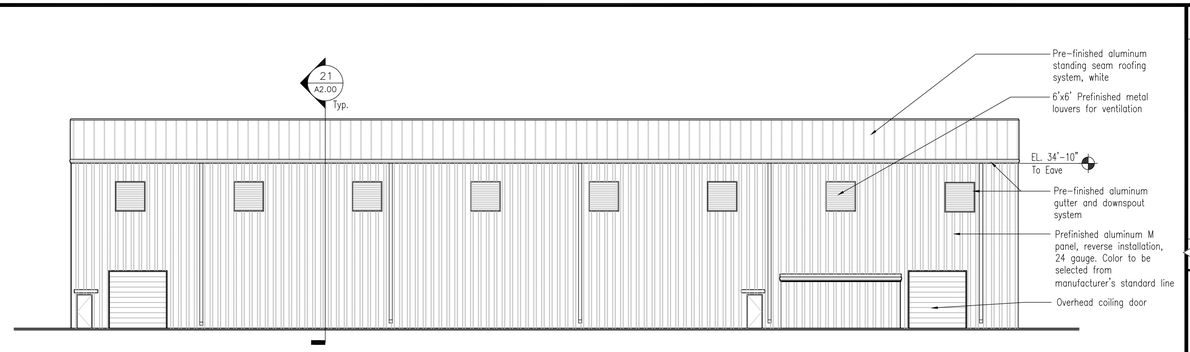

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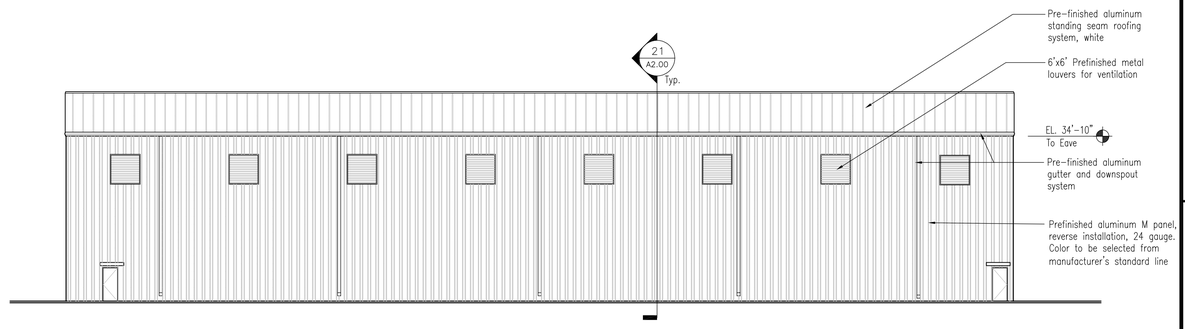

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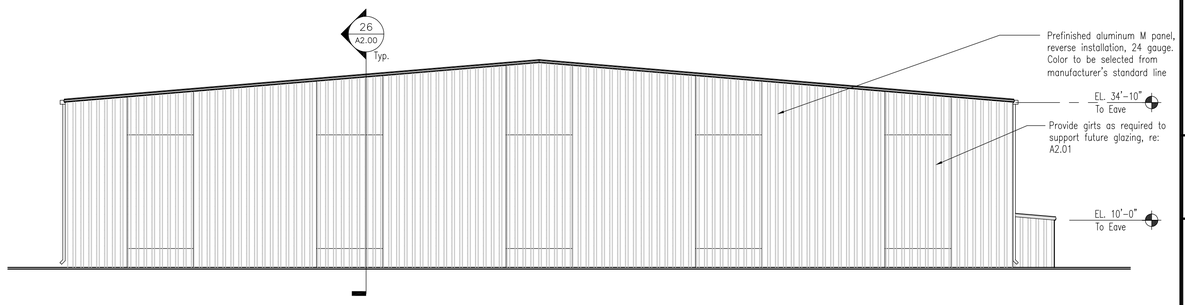

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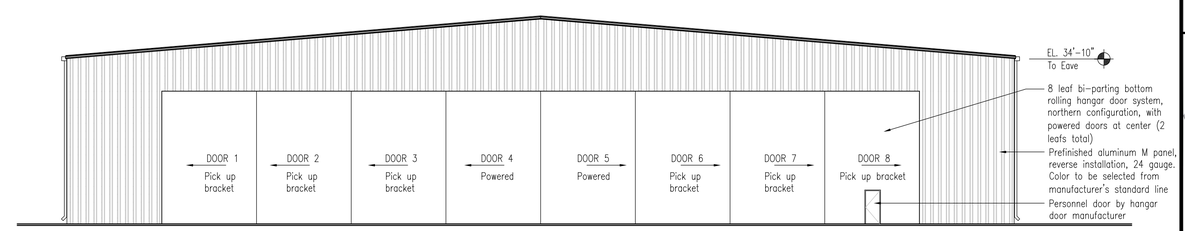

West Elevation Scale: 1/16"=1'-0" 01

MARK	REVISION	DATE
1	Addendum 1, 6/4/2020	

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DRAWING PATH\NAME | LAYOUT | PLOT DATE - TIME

TERMINAL APRON HANGAR REPLACEMENT PROJECT - SUGAR LAND REGIONAL AIRPORT - SUGAR LAND, TEXAS

SHEET NAME: Proposed Elevations Base Bid

PROJECT NAME: TERMINAL APRON HANGAR REPLACEMENT PROJECT
SUGAR LAND REGIONAL AIRPORT
SUGAR LAND, TEXAS

DRAWN BY: LHH
DESIGNED BY: LHH
LATEST REVISION: 03/20/2020
KSA JOB NO.: SG.061E

KSA
816 Park Two Dr., Sugar Land, Texas 77478
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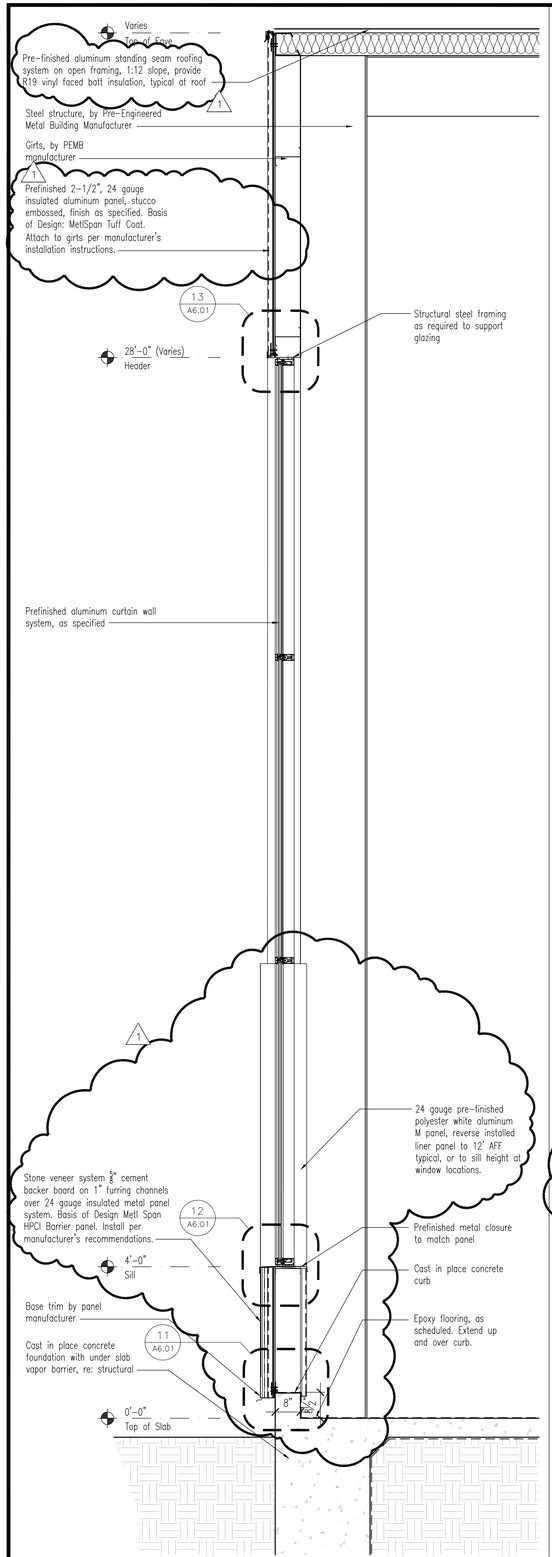
REGISTERED ARCHITECT
LITTLE H. HARRELL
16897
STATE OF TEXAS
3/20/2020

1

SHEET NO.
A2.00



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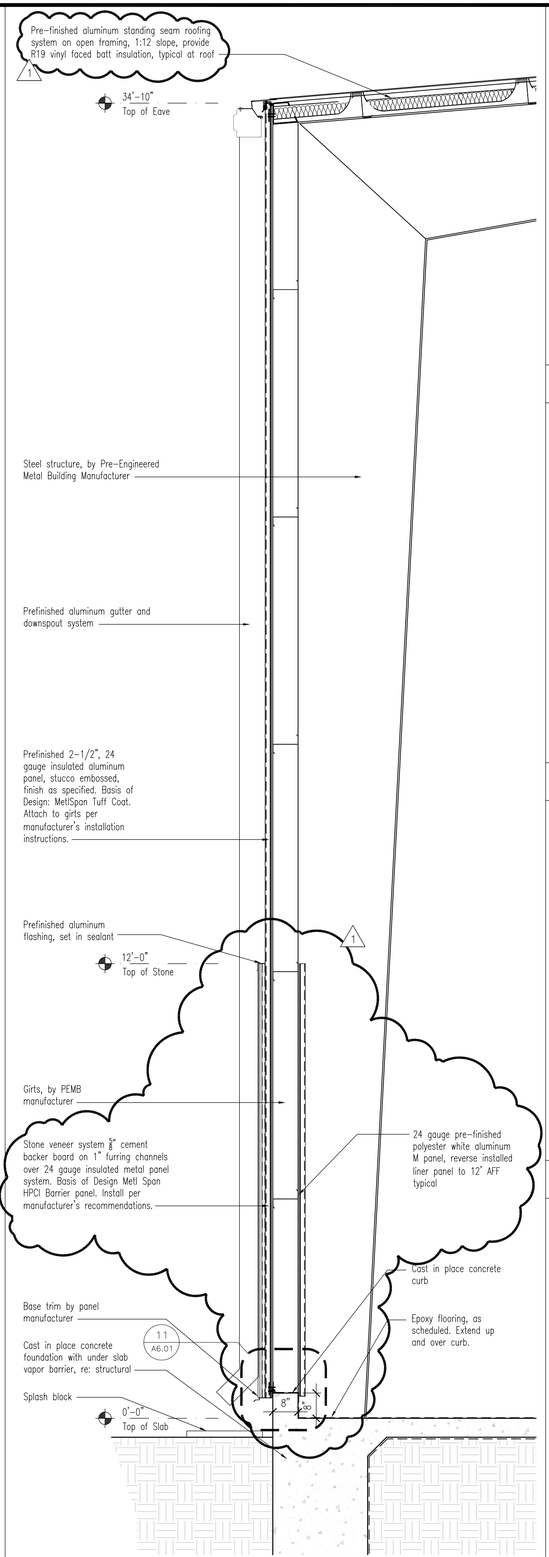
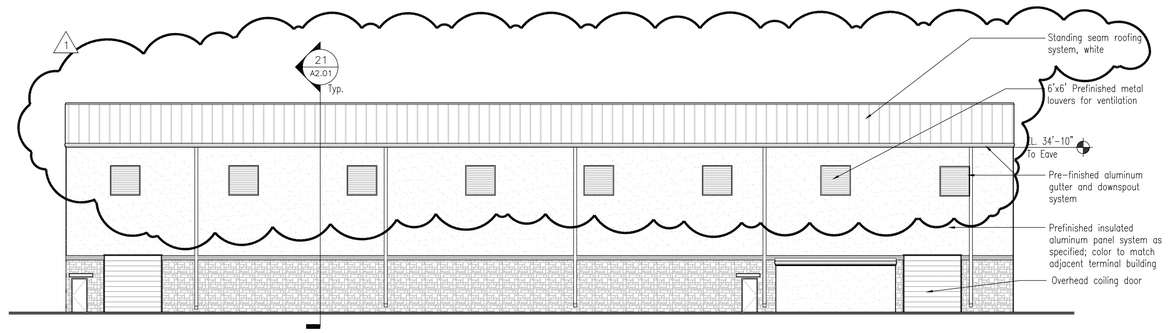
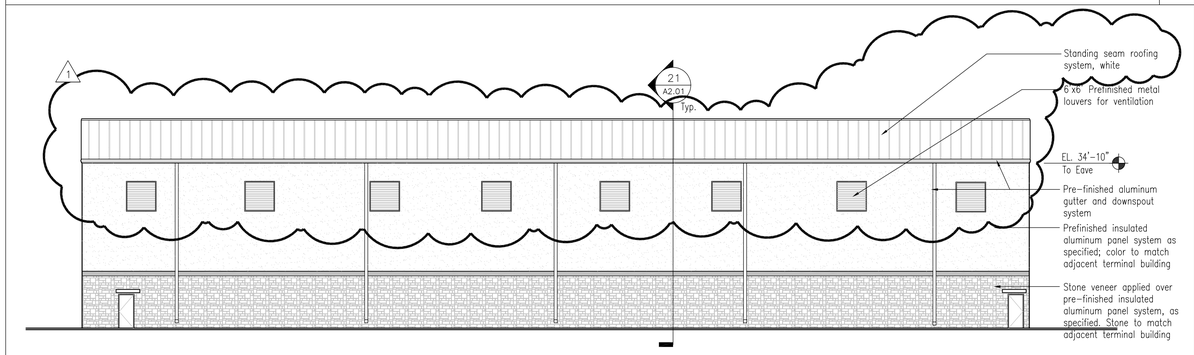


Typical Wall Section — Scale: 1/2"=1'-0" — 21



North Elevation — Scale: 1/16"=1'-0" — 04



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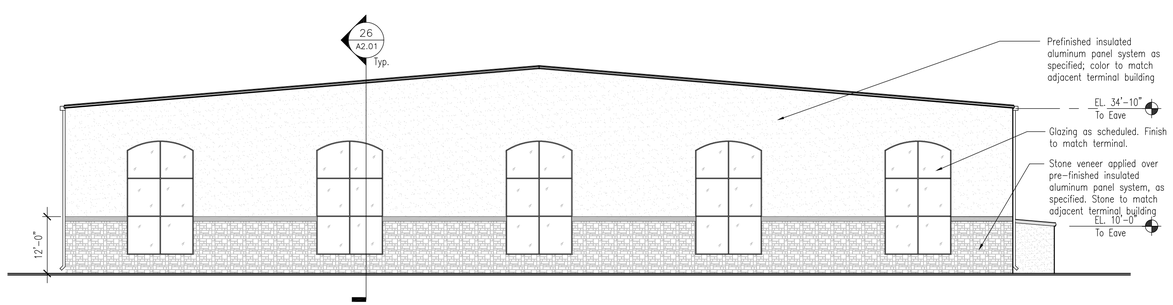

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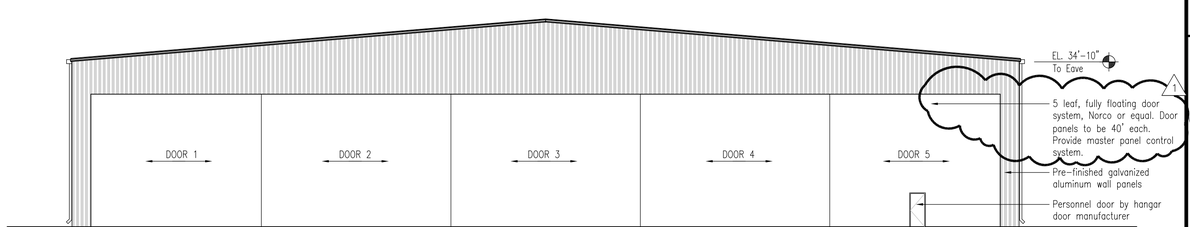

West Elevation — Scale: 1/16"=1'-0" — 01

MARK	REVISION	DATE
1	Addendum 1	6/4/2020

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DRAWING PATH\NAME | LAYOUT | PLOT DATE - TIME

SHEET NAME: Proposed Elevations

TERMINAL APRON HANGARS REPLACEMENT PROJECT - SUGAR LAND REGIONAL AIRPORT - SUGAR LAND, TEXAS

PROJECT NAME:
TERMINAL APRON HANGAR REPLACEMENT PROJECT
SUGAR LAND REGIONAL AIRPORT
SUGAR LAND, TEXAS

DRAWN BY:	DESIGNED BY:	LATEST REVISION:	KSA JOB NO.:
LHH	LHH	03/20/2020	SG.061E

KSA
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REGISTERED ARCHITECT — LYNITE HANNAH — 16897 — STATE OF TEXAS — 3/20/2020

SHEET NO.
A2.01

SECTION 07 42 13 – INSULATED METAL WALL PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Foamed-insulation-core concealed fastener metal wall panels, with related metal trim and accessories.

1.2 RELATED REQUIREMENTS

A. Division 07 Section "Sheet Metal Flashing and Trim" for sheet metal flashing items in addition to items specified in this Section.

B. Division 07 Section "Metal Wall and Roof Panels" for factory-formed metal wall, roof, and soffit panels.

C. Division 13 Section "Metal Building Systems" for steel framing supporting metal panels.

1.3 REFERENCES

A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org:

1. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
2. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.

B. American Society of Civil Engineers (ASCE): www.asce.org/codes-standards:

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International (ASTM): www.astm.org:

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 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
4. ASTM A 240 – Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
5. ASTM C 518 - Standard Test Method for Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
6. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
7. ASTM D 1621 - Compressive Properties of Rigid Cellular Plastics.
8. ASTM D 1622 - Apparent Density of Rigid Cellular Plastics.
9. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
10. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
11. ASTM D 6226 - Standard Test Method for Open Cell Content of Rigid Cellular Plastics

12. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
13. ASTM E 84 - Test Methods for Surface Burning Characteristics of Building Materials.
14. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
15. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
16. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

D. National Fire Protection Association (NFPA)

1. NFPA 259 – Test Method for Potential Heat of Building Materials.
2. NFPA 285 – Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies.
3. NFPA 286 – Fire Test of Evaluating Conditions of Wall and Ceiling Finish to Roof Fire Growth.

1.4 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer approved under an accredited third-party quality control program

B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum ten years' experience in the manufacturing of similar products and 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. Certificate from an accredited third-party Quality Control Program.

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.

1.5 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.

1.6 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, and special details. Make distinctions between factory and field assembled work.

1. Include data indicating compliance with performance requirements.
2. Indicate points of supporting structure that must coordinate with metal panel system installation.
3. 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:

1. Provide 12-inch- (305 mm) long section of each metal panel profile.
2. Provide color chip verifying color selection.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Results: Indicating compliance of products with requirements.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.

1.9 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. Protect painted surfaces with a protective covering before shipping.

1. Deliver, unload, store, and erect metal panels and accessory items without deforming panels or exposing panels to surface damage from weather or construction operations.
2. Store in accordance with Manufacturer's written instructions.
3. Shield foam insulated metal panels from direct sunlight until all components are installed.

1.10 WARRANTY

A. Special Manufacturer's Warranty: Submit Manufacturer's two (2) year limited warranty providing panels to be free from defects in materials and workmanship, beginning from the date of substantial completion excluding coil coatings (paint finishes) that are covered under a separate warranty.

B. The installation contractor shall issue a separate warranty against defects in installed materials and workmanship, beginning from the date of substantial completion of the installation.

C. Special Panel Finish Warranty: Submit Manufacturer's limited warranty on the exterior paint finish for adhesion to the metal substrate and limited warranty on the exterior paint finish for chalk and fade.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design Manufacturer: Metl-Span, a Division of the Cornerstone Building Brands family; Lewisville, Texas Tel: 972.221.6656; Email: info@metlspan.com; Web: metlspan.com.

B. Provide basis of design product: Metl-Span CF Tuff Wall or Approved Equal.

2.2 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 E 72 or ASTM E 1592 applied in accordance with ICC AC 04, Section 4, Panel Load Test Option or Section 5, Panel Analysis Option:

1. Wind Loads: Determine loads based on applicable building code, wind speed, importance factor, exposure category, and internal pressure coefficient indicated on drawings.

a. Wind Negative Pressure: Certify capacity of metal panels by 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 1/240 of the span with no evidence of failure.

C. Fire Performance Characteristics: Provide metal panel systems with the following fire-test characteristics determined by indicated test standard as applied by testing and inspection agency acceptable to authorities having jurisdiction.

1. Surface-Burning Characteristics: The insulating core shall have been tested per ASTM E 84. The core shall have:

a. Flame spread index: 25 or less.
b. Smoke developed index: 450 or less.

2. Fire Propagation: The fire assembly shall meet the requirements of the standard for NFPA 285
3. Fire Growth: The fire assembly shall meet the requirements of the standard for NFPA 286
4. Potential Heat: Determined in accordance with NFPA 259
5. IBC Chapter 26: Panel Performance under the above test methods, shall meet the requirements of IBC, Chapter on foam plastics.

D. Air Infiltration, ASTM E 283:

1. Maximum 0.0002 cfm/sq. ft. (0.001 L/s per sq. m) at static air pressure difference of 1.57 lbf/sq. ft. (75 Pa).
2. Maximum 0.0009 cfm/sq. ft. (0.005 L/s per sq. m) at static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
3. Maximum 0.01 cfm/sq. ft. (0.050 L/s per sq. m) at static-air-pressure difference of 20 lbf/sq. ft. (958 Pa).

E. Water Penetration Static Pressure:

1. ASTM E 331: No uncontrolled water penetration at a static pressure of 20 lbf/sq. ft. (958 Pa).
2. ASTM E 331 Modified (2 hour duration): No uncontrolled water penetration at a static pressure of 6.24 lbf/sq. ft. (300 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.

G. Thermal Performance: When tested in accordance with ASTM C 518, Measurement of Steady State thermal Transmission, the panels shall provide a k factor of 0.14 btu/sf/hr/deg F at a 75° F (24° C) mean temperature, as required by code, or 0.126 btu/sf/hr/deg F at a 40° F (4° C) mean temperature.

2.3 INSULATED METAL WALL PANELS

A. Concealed Fastener, Insulated Metal Wall Panels with foam core: Structural metal panels consisting of flat exterior metal sheet with heavy, stucco finish, and interior metal sheet with a light mesa profile, with factory foamed-in-place polyurethane core in thermally-separated profile, with tongue-and-groove panel edges, attached to supports using concealed fasteners.

1. Basis of Design: Metl-Span, CF Tuff Wall
2. G-90 galvanized coated steel conforming to ASTM A 653 or AZ-50 aluminum-zinc alloy coated steel, conforming to ASTM A 792/A 792M, minimum grade 33, prepainted by the coil-coating process per ASTM A 755/A 755M.
    a. Exterior Face Sheet: ***24 gauge*** thickness, with heavy stucco embossed surface
        1. Finish: Fiber-reinforced polymer coating
        2. Color: ***As selected by Architect from manufacturer's standard colors.***
    b. Interior Face Sheet: ***24 gauge*** thickness, with smooth unembossed surface Light Mesa profile
        1. Finish: Polyester white
        2. Color: As selected by Architect from manufacturer's standard colors.

3. Panel Width: 42 inches (1067 mm)
4. Panel Thickness: 2.5 inch (64 mm)
5. Insulating Core: Polyurethane with zero ozone depletion potential blowing agent
    a. Closed Cell Content: 90% or more as determined by ASTM D 6226
    b. Compressive Strength: As required to meet structural performance requirements and with a minimum of 22 psi as determined by ASTM D 1621
    c. Shear Strength: As required to meet structural performance requirements and with a minimum of 36 psi as determined by ASTM C 273
    d. Tensile Strength: As required to meet structural performance requirements and with a minimum of 41 psi ASTM D 1623
    e. Minimum Density: 2.0 pcf (32 kg/m3) as determined by ASTM D 1622

2.4 METAL WALL PANEL 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. Flashing and Trim: Match material, thickness, and finish of metal panels.

C. Panel Clips: ASTM A 653/A 653M, G90 (Z180) hot-dip galvanized zinc coating, one-piece, configured for concealment in panel joints, and identical to clips utilized in tests demonstrating compliance with performance requirements.

D. Panel Fasteners: Self-drilling or 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.

E. Joint Sealers:

1. Sealants: Provide Tape Mastic Sealants, Non-skinning sealants, and Urethane Sealants in accordance with manufacturers standards
2. Vertical Joint Gasket: Manufacturers standard EPDM gasket. Color: Black

2.5 FABRICATION

A. General: Provide factory fabricated and finished metal panels, trim, and accessories meeting performance requirements, indicated profiles, and structural requirements.

B. Fabricate metal panel joints configured to accept sealant providing weathertight seal.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings.

2.6 FINISHES

A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer’s written instructions.

B. Interior Face Sheet Coil-Coated Finish System

1. Fluoropolymer Two-Coat System: 0.2-mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat
    a. Basis of Design: Metl-Span, Fluoropolymer

PART 3 - EXECUTION

3.1 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.

1. 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.
2. Panel Support Tolerances: Confirm that metal panel supports are within tolerances acceptable to metal panel manufacturer but not greater than the following:
    a. 1/4 inch (6 mm) in 20 foot (6100 mm) in any direction.
    b. 3/8 inch (9 mm) over any single wall plane.
    c. Girt Spacing 8 feet (2438 mm) or more: 1/4 inch (6 mm) out only.
    d. Girt Spacing Less Than 8 feet (2438 mm): 1/8 inch (3 mm) out only.
    e. CF Architectural girt spacing less than 4 feet (1219 mm): 1/16 inch (1.5 mm) inch out only.

B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal panel installation.

3.2 METAL PANEL INSTALLATION

A. Concealed-Fastener Insulated Metal Panels with foam core: Install metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal panels in orientation, sizes, and locations indicated. Anchor panels and other components securely in place. Provide for thermal and structural movement.

B. Attach panels to metal framing using screws, fasteners, sealants, and adhesives recommended for application by metal panel manufacturer.

1. Fasten metal panels to supports with fasteners at each location indicated on approved shop drawings, at spacing and with fasteners recommended by manufacturer.
2. Cut panels in field where required using manufacturer's recommended methods.
3. Provide weatherproof jacks for pipe and conduit penetrating metal panels.
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 metal panel manufacturer

C. Attach panel flashing trim pieces to supports using recommended fasteners and joint sealers

D. Joint Sealers: Install 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 sealants indicated in manufacturer's instructions

2. Seal wall panel joints; apply continuously without gaps in accordance with manufacturer's written instructions, approved shop drawings, and project drawings
3. Prepare joints and apply sealants per requirements of Division 07 Section.

3.3 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.

3.4 FIELD QUALITY CONTROL

3.5 CLEANING AND PROTECTION

A. Remove temporary protective films immediately in accordance with metal panel manufacturer's instructions. 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

SECTION 074113.16 - STANDING-SEAM METAL ROOF PANELS

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 standing-seam metal roof panels.

B. Related Sections:

1. Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.
2. Section 077253 "Snow Guards" for prefabricated devices designed to hold snow on the roof surface, allowing it to melt and drain off slowly.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at **Project site**

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review structural loading limitations of purlins and rafters during and after roofing.
6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
8. Review temporary protection requirements for metal panel systems during and after installation.
9. Review procedures for repair of metal panels damaged after installation.
10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 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 type of panel and accessory.

B. Sustainable Design Submittals:

1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with Solar Reflectance Index requirements.
2. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.

C. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 3 inches per 12 inches (1:5).

D. Calculations:

1. Include calculations with registered engineer seal, verifying roof panel and attachment method resist wind pressures imposed on it pursuant to applicable building codes.

E. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

F. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches (305 mm) long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Manufacturer and Installer.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in architectural sheet metal products.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels until installation. Remove as panels are being installed. Verify film is not left on installed panels.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Galvalume Substrate Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems 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, or perforating.
    b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: 20 years and 6 months from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

    a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    c. Cracking, chipping, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

C. Special Watertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain watertight, including leaks, within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.
2. Shop drawings must be provided to, reviewed, and approved by panel manufacturer prior to panel system installation.
3. Inspections by panel system manufacturer technical representative are required. Perform first inspection when underlayment and flashing are in place and second inspection when the roof is complete.

D. Special Installer Warranty: Furnish a written warranty signed by the Panel Applicator guaranteeing materials and workmanship for watertightness of the roofing system, flashings, penetrations, and against all leaks.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 29 percent.

B. Solar Reflectance Index (SRI): Three-year-aged SRI not less than 64 or initial SRI not less than 82 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

C. Energy Performance: Provide roof panels that are listed on the EPA/DOE's ENERGY STAR "Roof Product List" for low-slope roof products.

D. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.
2. Deflection Limits: For wind loads, no greater than 1/180 of the span.

E. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 1680 and ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).

F. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 and ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 15 lbf/sq. ft. (718.2 Pa).

G. Hydrostatic Head Resistance: No water penetration when tested according to ASTM E2140.

H. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 90.

I. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces

2.2 STANDING-SEAM METAL ROOF PANELS

A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.
2. Aluminum Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1637.

B. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels : Formed with vertical ribs at panel edges and panel striations between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and mechanically seaming panels together.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Berridge Manufacturing Company; Zee-lock (90º seam) or comparable product by one of the following:

    a. MBCI
    b. Peterson
    c. CENTRIA
    d. Drexel Metals
    e. Morin
    f. ATUS International

2. Aluminum Sheet: Coil-coated sheet, ASTM B 209 (ASTM B 209M), 3105 alloy, with H14 temper as required to suit forming operations and structural performance required.

    a. Thickness: 0.032 inch (0.81 mm).
    b. Surface: Smooth, flat finish.
    c. Exterior Finish: Two-coat fluoropolymer
    d. Painted materials shall have a removable plastic film to protect the paint during roll forming, shipping and handling.
    e. Color: As selected by Architect from manufacturer's full range.
    f. For all galvalume substrate projects requiring a Watertightness Warranty, the Continuous Zee-rib must be utilized. If specifying the Zee-lock (90-degree bend), the vinyl weatherseal insert must be utilized as well. For aluminum panels, the two-piece floating Zee-Clip is required.

3. Clips: Continuous Zee-rib with Vinyl Weatherseal insert to accommodate thermal movement.

    a. Material: 0.024-inch (0.61-mm) nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.

4. Joint Type: Single folded.
5. Panel Coverage: 16 inches (406 mm).
6. Panel Height: 2.0 inches (51 mm).

2.3 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 40 mils (1.02 mm) thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D 1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Mid-States Asphalt Quick Stick HT Pro

b. Polyglass Polystick MTS
c. Soprema Lastobond Shield HT
d. Tamko TW Underlayment or TW Metal & Tile Underlayment

B. Felt Underlayment: ASTM D 226/D 22M, Type II (No. 30), asphalt-saturated organic felts.

2.4 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch (2400-mm) long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches (914 mm) o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.

E. Downspouts: Formed from same material as roof panels. Fabricate in 10-foot (3-m) long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.

F. Roof Curbs: Fabricated from same material as roof panels, 0.024 inch (0.61 mm) nominal thickness; galvalume or stainless steel; supply an integral full-length cricket for curbs wider than 24 inches (610 mm) supported by a structural metal deck. Fabricate curb flashing from 0.024 inch (0.61 mm). On open framing, provide roof underlayment and decking at and about roof curb per roofing manufacturer’s requirements. Maintain a minimum of 1/2 of roofing panel width on each side of roof curb, and start panels a minimum of 9 inches (229 mm) up slope of roof curb, flashing roofing panels to roof curb per roofing manufacturer’s requirements.. Fabricate curb and subframing to withstand indicated loads of size and height of roof top equipment. Where required insulate roof curbs with rigid insulation.

G. Panel Fasteners: Zinc-coated steel, corrosion resisting steel, zinc cast head, or nylon capped steel, type and size as approved for the applicable loading requirements.

H. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Joint Sealant: Silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.

2.5 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using factory set, non-adjustable, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
3. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. 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 same piece are unacceptable. 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.

C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75± 0.05 mil (0.0013 mm) over 0.2± 0.05 mil (0.0013 mm) primer coat, to provide a total dry film thickness of 0.95± 0.10 mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Mica Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75± 0.05 mil (0.0013 mm) over 0.2± 0.05 mil (0.0013 mm) primer coat, to provide a total dry film thickness of 0.95± 0.10 mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
3. Metallic Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75± 0.05 mil (0.0013 mm) over 0.2± 0.05 mil (0.0013 mm) primer coat, to provide a total dry film thickness of 0.95± 0.10 mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
4. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.35 mil (0.009 mm).

D. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75± 0.05 mil (0.0013 mm) over 0.2± 0.05 mil (0.0013 mm) primer coat, to provide a total dry film thickness of 0.95± 0.10 mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Mica Fluoropolymer: AAMA 2605. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75± 0.05 mil (0.0013 mm) over 0.2± 0.05 mil (0.0013 mm) primer coat, to provide a total dry film thickness of 0.95± 0.10 mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
3. Metallic Fluoropolymer: AAMA 2605. Two-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75± 0.05 mil (0.0013 mm) over 0.2± 0.05 mil

(0.0013 mm) primer coat, to provide a total dry film thickness of 0.95± 0.10 mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

    a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches (152 mm) staggered 24 inches (610 mm) between courses. Overlap side edges not less than 36 inches (914.4 mm). Roll laps with roller. Cover underlayment within 14 days or as directed by the underlayment product manufacturer.

1. At minimum apply over the roof area indicated below:

    a. Roof perimeter for a distance up from eaves of 24 inches (610 mm) beyond interior wall line.
    b. Valleys, from lowest point to highest point, for a distance on each side of 18 inches (460 mm). Overlap ends of sheets not less than 6 inches (152 mm).

c. Rake edges for a distance of 18 inches (460 mm).
d. Hips and ridges for a distance on each side of 12 inches (305 mm).
e. Roof-to-wall intersections for a distance from wall of 18 inches (460 mm)
f. Around dormers, chimneys, skylights, and other penetrating elements for a distance from element of 18 inches (460 mm)

B. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.4 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels to be level to 1/4 inch in 20 ft. (6 mm in 6.1 m).
2. Flash and seal metal panels at perimeter of all openings. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Locate and space fastenings in uniform vertical and horizontal alignment.
4. Install flashing and trim as metal panel work proceeds.
5. Panels should be continuous without end laps.
6. Align bottoms of metal panels and fasten.
7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use stainless-steel fasteners for surfaces exposed to the interior.

C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates, if required, at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied vinyl weatherseal are completely engaged.

F. Accessory Installation: 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 panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.

G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

H. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches (914 mm) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

I. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.

1. Provide elbows at base of downspouts to direct water away from building.
2. Connect downspouts to underground drainage system indicated.

J. Roof Curbs: Install flashing around bases where they meet metal roof panels.

K. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.

B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.

C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113.16

KSA A·DYNAMIC·PERSPECTIVE

Contractor Questions

To: All Plan Holders

Project: Terminal Apron Hangar Replacement Project

Airport: Sugar Land Regional Airport

KSA Project No.: SG.061E

Date: Thursday, June 4, 2020

Client Project No.: TxDOT CSJ No. 18HGSUGAR-REBID

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1. Question: I did not see a substitution form unless I missed. Please verify if Kingspan's "Granitestone" Insulated wall panel is acceptable (2.5" thick x 42" 22ga / 22ga) (See attached data sheet)?
   Response: This is an acceptable substitution.

2. Question: The Interior sheet spec calls for Kynar finish with color from manufacturer's standard colors. Interior panel finish is always polyester White (Such as Igloo White or Imperial White) is this type of Polyester White acceptable for finish on interior skin of sandwich panel? Or do we need a Kynar finish standard color?
   Response: This is clarified in the drawings and specifications. Color to be standard, white ok on interior.

3. Question: Please verify if Varco Pruden is acceptable PEMB manufacturer?
   Response: This is an acceptable substitution.

4. Question: Please clarify intent for roof panel type. Is roof panel to be 24ga PBR screw down panel with reflective white finish? Or should roof panel be trapezoidal rib standing seam?
   Response: See attached spec for standing seam metal roof system and updated drawings.

5. Question: What is intended wall panel type on West (Left End Wall) wall at sides and gable above sliding door opening? Elevations show "Pre-Finished Galvanized Aluminum Panels." Should this be 24ga PBR screw down wall panel? Or will this be Insulated Wall Panel?
   Response: Wall is M-panel, reverse installed, typical for base bid as well as all alternate scenarios.

6. Question: Spec section 083416-4 under note 9 calls for exterior and interior siding and trim and insulation for Norco door leaves to be provided by building manufacturer. What are panel types required for the door leaves?
   Response: The panels on the façade will be M panel, as indicated on the revised drawings.

7. Question: Elevations on A2.01 and Mechanical plan M2.1 show conflicting quantity and size of louvers. Mechanical M2.1 looks like total of 16 (8 on each sidewall) openings for louvers or exhaust fans. Please verify these can be located to allow X bracing in at least two sidewall bays? Or that bracing is allowed to run behind louver? Or should we design and price for portal frame bracing?
   Response: Architectural is updated to match Mechanical. Louvers may be shifted as required within 12", and bracing is allowed to run behind louver, if necessary.

8. Question: Alternate #3 calls for "East Wall Exterior Enhancements." Please clarify change here as compared to base price?
   Response: This includes the addition of the insulated panels, stone veneer and windows, east wall only.

9. Question: Alternate #5 calls for "North and South Wall Exterior Enhancements." Please clarify change here as compared to base price?
   Response: This included alternate 3 above, along with insulated metal panels and stone veneer on north and south elevations.

10. Question: Section 21 on drawing A2.01 shows R-38 roof insulation. Is banded insulation acceptable, or should "Simple Saver" (Fabric liner system) type system be provided?
    Response: Clarified on drawings. R 19 at roof, vinyl backed batts.

11. Question: I need to get clarification on base bid and alternate # 1 for Norco bottom rolling door Alternate. The drawing show 180' wide opening with no pockets extending beyond main building sidewalls with five big leaves at about 36' wide. Hangar door spec 083416-1 calls for 180' wide clear opening. For base bid bi-parting door with 22'-6" leaves that would be a little less than 135' clear with door open. For alternate with full floating system with five 36' leaves you could get a little less than 144' clear?
    Response: Base bid hangar door to be 10 leaf bi-parting door, 2 center leaves powered, all others operated with pick up brackets. 160' opening.
    Alternate is 5 leaf fully floating system ~36' panels. Opening would be approximately 150' clear.

12. Question: For the Addendum 1 approvals flooring, Sec 09 96 00, High Performance Coating, is the previous substitution request from September 2018 still valid or does it need to be resubmitted?
    Response: The substitution request would need to be resubmitted for this specific project.

13. Question: Can you confirm if the requirement noted in SP-4 of the special conditions will apply for the Sugar Land Hangar? The way I interpret that provision is the GC must self-perform 30% or more of the contract in order for their bid to be considered. Can you advise if this contractual requirement will be enforced?
    Response: Yes, on all TxDOT Aviation Contracts 30% required for General Contractors.

14. Question: For the interior liner panel what are its limits from the finished floor elevation? Will the liner panel extend up the full length of the wall or will it go up to 8 feet?
    Response: Refer to revised sheets A2.00 and A2.01 included in this email.

15. Question: Clarification in regards to sheet S0.01 and the reference to two different "maximum horizontal drift" numbers. It gives two different horizontal deflection numbers based on whether or not the walls have sheetrock/masonry.
    Response: The maximum horizontal building drift (inches) at the eaves for the building (frames & x-bracing) to be eave height (inches) / 250. The maximum horizontal deflection (inches) for walls (girts, eave struts, door frames, prefab panels, etc.) to be span of member (inches) / 250.

16. Question: I was wondering if there were plans and specs for this project?
    Response: The project plans, specifications and bid documents can be found on TxDOT's Aviation website. I have provided for reference. https://www.txdot.gov/inside-txdot/division/support/plans-online.html

Approved Substitution Request:

1. Red Dot Building – Pre Engineered Metal Building Manufacturer (PEMB)
2. Varco Pruden – Pre Engineered Metal Building Manufacturer (PEMB)
3. Tennant Company-Architectural Coatings – Flooring
4. Sika Flooring by Steve Manchester/NAH Sports Flooring, Sikafloor Morritex Hangar Floor System -- Flooring
5. Big Ass Fans – HVLS Supplier
6. Kingspan's "Granitestone" Insulated wall panel is acceptable (2.5" thick x 42" 22ga / 22ga)

KSA A·DYNAMIC·PERSPECTIVE

Pre-Bid Meeting

Airport: Sugar Land Regional Airport

Organizer: Nathan Mikell

Date: Wednesday, May 20, 2020 @ 10:00 AM

KSA Project No.: SG.061E

Project: Terminal Apron Hangar Replacement

Client Project No.: TxDOT CSJ No. 18HGSUGAR-REBID

I. **Sign In Sheet**

II. **Introductions and Roles**

A. Elizabeth Rosenbaum, Acting Director of Aviation, Sugar Land Regional Airport

B. Mitchell Davies, Airport Planning and Development Manager, Sugar Land Regional Airport

C. Stephanie Kleiber, P.E., Project Manager, TxDOT Aviation

D. Craig Clairmont, P.E., Project Manager, KSA

E. Nathan Mikell, P.E., Senior Project Engineer, KSA

III. **Bidding Procedures**

A. See Notice to Bidders and Instructions to Bidders section in Contract Documents for bidding information.

B. All bidders are encouraged to review all contract documents including Mandatory Federal Contract Provisions, TxDOT General Provisions, Special Provisions, and Specifications.

C. Technical questions/comments should be submitted to Craig Clairmont (cclairmont@ksaeng.com 281-494-3252) or Nathan Mikell (nmikell@ksaeng.com, 281-494-3252) by Tuesday, May 2, 2020, at 5:00 PM. Questions must be in writing and received prior to date mentioned. All questions asked during the pre-bid meeting shall be submitted in writing to KSA for official response.

D. For other information visit the TxDOT Aviation website or call Sheri Quinlan at 512-416-4516.

E. Sealed bids for the construction of airport improvements at the Sugar Land Regional Airport are due to be delivered to Mr. Thomas Harris III, City Secretary, 2700 Town Center Boulevard North, Suite 122, Sugar Land, Texas 77479 at 2:00 p.m. on June 10, 2020. At that time, bids will be publicly opened and read aloud in the Sugar Land City Hall, Council Chambers, 2700 Town Center Boulevard North, Sugar Land, Texas 77479, which is located on the 1st floor in City Hall. Any bid received after closing time will be returned unopened.

F. Bid Proposal

1. Bidders must utilize the bid proposal form provided on TxDOT's website.

2. Bidders must provide pricing for the Base Bids and all Alternates. The contract award will be based on the lowest qualified bid plus any combinations of alternates.

G. Bidders shall reference the TxDOT Aviation Division General Construction Contract Provisions as they are part of the contract.

1. http://txdot.gov/inside-txdot/division/aviation/general-provisions.html

H. Addenda

1. Bidders are responsible for checking the TxDOT website regularly to check for any changes to the bid documents, such as Addendums.

I. Contract will be awarded within 60 calendar days from bid opening.

J. State funded project

1. This project has a HUB Goal requirement. Questions regarding HUB Goal percentage and Good Faith Efforts should be directed to Sheri Quinlan at 512-416-4516.
2. The statewide HUB goals are defined in 34 Texas Administrative Code (TAC) §20.284.
3. HUB Subcontracting Plan (HSP) shall be turned in with bid for bid to be deemed responsive.
4. Wage rate requirements will be required as shown in the Contract Documents.
5. Buy American – Steel and Manufactured Products for Construction Contracts (See Special Notice to Bidders).

K. Bidders List

1. To be placed on the Bidders List for this project, please send an email that includes the TxDOT CSJ No. for this project (18HGSUGAR-REBID), your company name, mailing address, and your phone & fax number to AVNRFQ@txdot.gov.

IV. Scope of Work

A. Base Bid – Hangar Utilities, Site Work and Hangar Construction

B. Alternate No. 1: All Moving/Floating Hangar Door System with Centralized Controls/Motherboard

C. Alternate No. 2: Parking Lot, Access Drives, and Relocated Covered Parking Structures

D. Alternate No. 3: East Wall Exterior Enhancements (Stone Veneer, Stucco Wall Panel System and Glazing)

E. Alternate No. 4: Paint Interior Primary Structural Members

F. Alternate No. 5: North and South Wall Exterior Enhancements (Stone Veneer, Stucco Wall Panel System)

G. Alternate No. 6: Equipment Parking Area with Metal Canopy

H. Alternate No. 7: Hangar Bay High Volume Low Speed (HVLS) Ceiling Fans

I. Alternate No. 8: Landscaping (Including Sprinkler System)

V. Site Access / Staging Areas

A. Site Access and Staging Area

1. Contractor staging area and material storage/stockpile areas shall be at the locations shown on the phasing sheets in the plan set. (Sheet 10)

VI. Safety and Phasing Plan

A. Contractor will be required to be in compliance with FAA Advisory Circular 150/5370-2G, Operational Safety on Airports during Construction.

B. Contractor will prepare a Safety Plan Compliance Document that outlines how they intend to comply with the established Construction Safety and Phasing Plan requirements.

C. Contractor to provide heights of construction equipment to Engineer.

D. Phase 1

1. Reconstruct Section of Terminal Apron Pavement
2. Remove and Reinstall Storm Sewer Pipe
3. Relocate/Adjust Utilities (Centerpoint, Windstream, Gravity San. Sewer and Airfield Electric)
4. Perform Demolition Activities

E. Phase 2

1. Construct Aircraft Hangar (~38,000 SF)

2. Construct Parking Lot and Access Road Pavement

VII. **Other Information**

A. Contract Time

1. 240 **Calendar** days for Base Bid
2. 0 **Calendar** days will be added to the contract time if any of the alternates are awarded
3. Liquidated Damages are **$1,000** per calendar day beyond contract time

B. RPR Office (as required per Specification KSA-100)

C. Materials Acceptance by Owner / Materials Quality Control by Contractor

D. Protection of any existing utilities in the project area is the responsibility of the Contractor. Engineer has endeavored to show all known utilities within the Contract documents, but this shall not relieve the Contractor from full responsibility in anticipating all underground obstructions, whether or not shown on the plans. Contractor should call for utility locates and verify locations of all utilities prior to starting construction.

E. SW3P – Contractor's Responsibility

F. Engineer's Construction Estimate

1. Base Bid = $5,679,409

Notes:

KSA

Sugar Land Regional Airport
Terminal Apron Hangar Replacement Project
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Pre-Bid Sign In Sheet
Wednesday, May 20, 2020 @ 10:00 AM

NAME	ADDRESS	PHONE	EMAIL
William Paz	16554 Creekbend dr Sugar Land TX, 77478	713-493-2500	RFPGcontractors.com
Joe Roemen	" "	713-493-2500	RFPGcontractors.com
PAUL COLE (GRAY & BECKER CONST	9809 BECK CIRCLE AUSTIN, TX 78758	512-917-0567	paul@grayandbecker.com
(Archer Western) James Dean	Archer Western 2700 N Terminal Rd Houston TX	832.405.4084	JaDean@walshgroup.com

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NAME	ADDRESS	PHONE	EMAIL
Gary High Holt Construction		713-653-3339	ghigh@holtcc.com
Gabriel Stamatelos		9722130050	gstamatelos@walshgroup.com
Glenn Kwapis	Archer Western 2700 N Terminal Rd Houston, TX	313 215 6118	gkwapis@walshgroup.com
Priscila Larrea		407.351.2028	plarrea@walshgroup.com
John Cameron	A1 Construction Serv Concrete & Asphalt	832-421-5474	jCameron@A1SP.com
Rex Kirkley	Tres Cosas, LLC	936-332-3023	rkirkley@trescosas.net
Kyle Foster LDF Construc	8889 Cowl Spur Ct. Conroe Tx 77304	281-353-0936	maryw@ldfconstruction.com
Shea Johnson	Jacob White Construction Houston, TX	281-286-6666	s.johnson@jacobwhitecc.com

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NAME	ADDRESS	PHONE	EMAIL
Justin Kelly Morganti	10590 Westoffice Dr Suite 150 Houston, TX 77042	713-806-9286	JKelly@Morganti.com
JEFF JEFFERSON PATRIOT CONTRACTING	300 SHEPHERD SUITE A HOUSTON, TEXAS 77007	713-880-3445	JHJ@PATRIOTLLC.US
RONIK PATEL JACOB WHITE CONSTRUCTION	2000 W. PARKWOOD AVE. FRIENDSWOOD, TX 77546	281-286-666666	r.patel@jacobwhitecc.com
Les Messer Spaw Glass	13800 West Rd. Houston, Tx 77041	281-970-5300	Civilestimating@Spawglass.com Les.Messer@Spawglass.com
ROBERT SUTTLES MBC MANAGEMENT	7984 HWY 6 NAVASOTA, TX	936 825-1603	BIDS@MBCMUSA.COM R.SUTTLES@MBCMUSA.com

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NAME	ADDRESS	PHONE	EMAIL
MITCHELL DAVIES	AIRPORT	281-275-2408	mdavies@sugarlandtx.gov
Elizabeth Rosenbaum	Airport	281-275-2100	erosenbaum@sugarlandtx.gov
Construction LTD Ron Weiser	1825 Upland Houston Tx 77043	713-984-9444	rweiser@cltd.net
Kyle Stephenson ET Design Build	1800 Hughes Landing Blvd The Woodlands, TX 77380	713-829-2762	KStephenson@ETENV.com
Cam'Ron Mosley University of Houston	4800 Calhoun Rd, Houston TX 77004	972835-6432	cam'ron.mosley@gmail.com
Brian White EERED Construction	333 commerce green Sugar Land, TX 77478	2819334000	bwhite@eereed.com

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NAME	ADDRESS	PHONE	EMAIL
Reino Finnstrom	NAH Sports Flooring	512.680.0555	rfinnstrom@covington.com
1. Isabell Alvarado 2. Julie Rastegar (Contact)	Millis Construction and Developement	281.240.6066	julie@millis.com
Dale Larson	Door Engineering	507.934.0542	dlarson@doorengineering.com
1. James Matthews 2. Jerry Stafford	Manhattan Construction	1. 713.332.7238 2. 713.529.0000	1. jmatthews@manhattonconstruction.com 2. jstafford@manhattonconstruction.com
Arron Haws	SpawGlass	435.214.6163	Arron.haws@spawglass.com
Stephanie Kleiber	TxDOT Aviation	512.416.4524	Stephanie.Kleiber@txdot.gov
Francisco Cortez	KSA Engineers	281.494.3252	Fcortez@ksaeng.com