ADDENDUM NO. 1

PROJECT MANUAL

PANOLA COUNTY
CARTHAGE, TEXAS
2026 AIRPORT ELECTRICAL AND PAVEMENT IMPROVEMENTS
TXDOT CSJ NO. 2619CARTH

Bids will be received until April 29, 2026, at 2 P.M., local time.

This Addendum to the Project Manual is issued to modify, explain, or correct the original Contract Documents and Specifications for 2026 Airport Electrical and Pavement Improvements (TxDOT CSJ No. 2619CARTH) and is hereby made part of the Contract Documents. Acknowledgement of receipt of the 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.

A. NONMANDATORY PREBID CONFERENCE MEETING DOCUMENTS

1. MEETING AGENDA, MINUTES, AND REGISTER.

   ADD the attached Nonmandatory Prebid Conference Meeting Agenda, Minutes, and Register.

B. BID FORM

1. 2619CARTH BID FORM

   REPLACE Bid Form with the attached revised Bid Form.

C. FAA SPECIFICATIONS

1. MODIFICATION TO ITEM L-109–AIRPORT TRANSFORMER VAULT AND VAULT EQUIPMENT

   REPLACE Modification to Item L-109–Airport Transformer Vault and Vault Equipment with the attached revised Modification to Item L-109–Airport Transformer Vault and Vault Equipment.

2. ITEM L-109–AIRPORT TRANSFORMER VAULT AND VAULT EQUIPMENT

   REPLACE Item L-109–Airport Transformer Vault and Vault Equipment with the attached revised Item L-109–Airport Transformer Vault and Vault Equipment.

D. FAA SPECIAL SPECIFICATIONS

1. ITEM SS-300–AUTOMATIC TRANSFER SWITCH

   a. Pages SS-300-1 through SS-300-5, ITEM SS-300–AUTOMATIC TRANSFER SWITCH.

   ADD new Item SS-300–Automatic Transfer Switch to the Technical Specifications Manual.

E. TXDOT SPECIFICATIONS INCLUDING SPECIAL PROVISIONS

1. SPECIAL PROVISION ITEM 341–DENSE-GRADED HOT-MIX ASPHALT

   a. Page 3 - 5, SPECIAL PROVISION TO ITEM 341–DENSE-GRADED HOT-MIX ASPHALT.

   REPLACE page 3 - 5 with the attached revised page 3 - 5.

F. DRAWINGS

1. SHEET NO. 5–PROJECT QUANTITIES

   REPLACE Sheet No. 5 with the attached revised Sheet No. 5.

2. SHEET NO. 77–ELECTRICAL PLAN–III

   REPLACE Sheet No. 77 with the attached revised Sheet No. 77.

3. SHEET NO. 85–VAULT DETAILS–I

   REPLACE Sheet No. 85 with the attached revised Sheet No. 85.

4. SHEET NO. 86–VAULT DETAILS–II

   REPLACE Sheet No. 86 with the attached revised Sheet No. 86.

****

BIDDERS MUST ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED IN THE BID FORM

****

Dated at Brenham, Texas
April 22, 2026

STRAND ASSOCIATES, INC.®
TBPE No. F-8405
TBPLS No. 10030000
1906 Niebuhr Street
Brenham, TX 77833

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Agenda
Nonmandatory Prebid Conference
2026 Airport Electrical and Pavement Improvements
TxDOT CSJ No. 2619CARTH
Panola County, Texas
April 15, 2026, 11 A.M.

1. Introduction

2. General Project Description and Overview

   a. Project Description

   b. Bidding

   c. Disadvantaged Business Enterprise (DBE) Requirements

   d. Bid Delivery

   e. General Provisions

3. Addenda

c: All Participants

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Minutes
Nonmandatory Prebid Conference
2026 Airport Electrical and Pavement Improvements
TxDOT CSJ No. 2619CARTH
Panola County, Texas
April 15, 2026, 11 A.M

1. Introduction of those Present–The following people were in attendance at the conference:

Attendees	Representing	Contact
Robert Duncan, Airport Manager	Panola County (Owner)	Tel: 903-690-2833 E-mail: airport.manager@co.panola.tx.us
Billy Alexander	Panola County	Tel: 903-690-6213 E-mail: balexander@co.panola.tx.us
Rodger McLane	Panola County	Tel: 903-754-3899 E-mail: rodger.mclane@co.panola.tx.us
Pamela Pate	Panola County	E-mail: pam.pate@co.panola.tx.us
Earl Spurlock	Texas Department of Transportation–Aviation Division (TxDOT)	Cell: 512-658-9270 E-mail: earl.spurlock@txdot.gov
Caitlin McGuingle, P.E.	Texas Department of Transportation–Aviation Division	Tel: 737-256-9075 E-mail: caitlin.mcguingle@txdot.gov
Ryan Hindman, P.E., Project Manager	Texas Department of Transportation–Aviation Division	Cell: 512-520-7467 E-mail: ryan.hindman@txdot.gov
Daniel Prior	Enterprise Commercial Paving, Inc. (Enterprise)	Tel: 713-206-1107 E-mail: dprior@ecpaving.com
Emily Frank	Texas Materials Group, Inc. (Texas Materials)	Tel: 936-635-3324 E-mail: emily.frank@texasmaterials.com
Jody Herrington	Texas Materials Group, Inc.	Tel: 936-465-7881 E-mail: jody.herrington@texasmaterials.com
Clayton Zuber	Allen Keller Company (Allen Keller)	Cell: 830-377-7691 E-mail: czuber@allenkellerco.com
Brandon Alcala	Don Jackson Construction, Inc. (Don Jackson)	Cell: 214-790-5903 E-mail: info@djctx.com
Jared Engelke, P.E., Project Manager	Strand Associates, Inc.® (Engineer)	Tel: 979-836-7937 ext. 6203 E-mail: jared.engelke@strand.com
Thomas Berry	Strand Associates, Inc.®	Tel: 979-836-7937 ext. 6258 E-mail: thomas.berry@strand.com

2. General Project Description and Overview

a. Project Description
   (1) Base Bid
      (a) Replace the low intensity runway (RW) light system with a light-emitting diode (LED) medium intensity runway light system, including LED guidance signs.
      (b) Replace the electrical vault.
      (c) Replace the precision approach path indicator system (both RW ends).
      (d) Replace the beacon and beacon tower with an LED beacon and tip-down tower.
      (e) Remove the existing wind cone.
      (f) Replace the existing wind cone and segmented circle.
      (g) Reconstruct RW 17-35.
      (h) Reconstruct Taxiway (TW) A.

(i) Reconstruct cross TWs.
(j) Remove the existing cross TW.

(2) Alternate Bid No. 1–Reconstruct the hangar access TW and apron.

b. Bidding–Bidders must Bid on the Base Bid and Alternate Bid No. 1.

c. Disadvantaged Business Enterprise Requirements–This is not applicable for this project.

d. Historically Underutilized Business (HUB) Requirements
(1) Respondents are encouraged to maximize the HUB utilization equal to the statewide HUB goals for the type of work being contracted.
(2) Contact Eli Lopez with TxDOT via telephone at 512-902-0806 or e-mail at eli.lopez@txdot.gov if there are questions.

e. Bid Delivery–Sealed Bids for the airport improvements construction project at the Panola County Airport–Sharpe Field need to be addressed and delivered to Bandy Schwettmann, TxDOT Aviation Division, 6230 East Stassney Lane, 2nd Floor, Austin, TX 78744. The delivered package must be clearly marked as "Bid Proposal." Bids will be received until 2 P.M. on April 29, 2026, and then publicly opened and read. Any bids received after closing time will be returned unopened.

f. General Provisions
(1) Contract Time–175 calendar days for Base Bid and 14 days for Alternate Bid No. 1.
(2) Liquidated Damages–$1,000 per calendar day
(3) Bid Form should be completed online and then signed with ink.
(4) Each bidder must be prequalified or submit qualification statements with Bids.

3. Addenda

a. There are no addenda at this time.

b. Addendum No. 1 will include the following:
(1) Sign-in sheet.
(2) Prebid Conference Agenda.
(3) Issues or clarification from the Prebid Conference.

c. The deadline for questions from contractors is 5 P.M. on April 17, 2026, and Addendum No. 1 will be posted on April 22, 2026.

4. Questions and comments from Prebid Conference

a. Don Jackson asked where the treated base stop on TW A should be located. Engineer stated the *Geotechnical Investigation for Panola County–Sharpe Field Airport* (prepared by Rodriguez Engineering Laboratories, LLC and dated April 9, 2025) outlines the locations of the bores along TW A where the treated base was encountered.

b. Don Jackson asked whether Owner wants the pavement and base material removed by the contractor awarded the project. Engineer stated that the Drawings indicate Owner would like to keep this material and requests that contractor coordinate with Owner to identify a suitable location for storage of this material.

c. Allen Keller asked whether water is available for construction and, if available, where can the contractor obtain the water. Owner stated that there is a location approximately 1.5 miles from the Panola County Airport–Sharpe Field where water can be purchased from the City of Carthage, Texas.

d. TxDOT stated all parties should download the Bid documents from the TxDOT Web site as soon as possible.

If there are any additions or comments, please call 979-836-7937.

Prepared and respectfully submitted by Jared D. Engelke, P.E.

Enclosure

c/enc: All Attendees

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Meeting Register
Nonmandatory Prebid Conference
2026 Airport Electrical and Pavement Improvements
TxDOT CSJ No. 2619CARTH
Panola County, Texas
April 15, 2026, 11 A.M.

Please verify your contact information. If it is correct, please check the box (☐) to the left. If updates are necessary, or if you have not previously provided this information, please print your information in the spaces provided.

	Name/Representing	Mailing Address	Contact Information	
☒	Robert Duncan Panola County Airport - Sharpe Field	1305 United States Highway 79 North Carthage, Texas 75633	Phone No.: Cell No: Fax No.: E-mail:	903-690-2833 airport.manager@co.panola.tx.us
☒	Billy Alexander Panola County	110 S Sycamore, Room 102-A Carthage, TX 75633	Phone No.: Cell No: Fax No.: E-mail:	903-690-6213 balexander@co.panola.tx.us
☒	Rodger McLane Panola County	110 S Sycamore, Room 216-A Carthage, TX 75633	Phone No.: Cell No: Fax No.: E-mail:	903-754-3899 rodger.mclane@co.panola.tx.us
☒	Earl Spurlock TxDOT Aviation	6230 E. Stassney Lane Austin, TX 78744	Phone No.: Cell No: Fax No.: E-mail:	 512-658-9270 earl.spurlock@txdot.gov
☒	Ryan Hindman, P.E. TxDOT Aviation	6230 E. Stassney Lane Austin, TX 78744	Phone No.: Cell No: Fax No.: E-mail:	 512-520-7467 ryan.hindman@txdot.gov
☐	Christian Cox TxDOT Aviation	6230 E. Stassney Lane Austin, TX 78744	Phone No.: Cell No: Fax No.: E-mail:	 christian.cox@txdot.gov
☒	Jared D. Engelke, P.E. Strand Associates, Inc.®	1906 Niebuhr Street Benham, Texas 77833	Phone No.: Cell No: Fax No.: E-mail:	979-836-7937 jared.engelke@strand.com
☒	Thomas L. Berry Strand Associates, Inc.®	1906 Niebuhr Street Benham, Texas 77833	Phone No.: Cell No: Fax No.: E-mail:	979-836-7937 Thomas.berry@strand.com

Addendum No. 1

STRAND ASSOCIATES®
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Meeting Register
Nonmandatory Prebid Conference
2026 Airport Electrical and Pavement Improvements
TxDOT CSJ No. 2619CARTH
Panola County, Texas
April 15, 2026, 11 A.M.

	Name/Representing	Mailing Address	Contact Information
☐	Tyler Tarjick / Enterprise Commercial Paving		Phone No.: 713-206-1107 Cell No: Fax No.: E-mail: Dprior@ecpaving.com
☐	Emily Frank Texas Materials		Phone No.: 936-635-3324 Cell No: Fax No.: E-mail: emily.frank@texasmaterials.com
☐	Jody Herrington Texas Materials		Phone No.: 936-465-7881 Cell No: Fax No.: E-mail: jody.herrington@texasmaterials.com
☐	Pamela Pate PC Administrative Assistant		Phone No.: Cell No: Fax No.: E-mail: pam.pate@co.panola.tx.us
☐	Bill Alexander / Commissioner		Phone No.: 903 690 6213 Cell No: Fax No.: E-mail:
☐	CAITLIN MCGUNIGLE TXDOT AVN		Phone No.: (737) 256-9075 Cell No: Fax No.: E-mail:
☐			Phone No.: Cell No: Fax No.: E-mail:
☐			Phone No.: Cell No: Fax No.: E-mail:

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Meeting Register
Nonmandatory Prebid Conference
2026 Airport Electrical and Pavement Improvements
TxDOT CSJ No. 2619CARTH
Panola County, Texas
April 15, 2026, 11 A.M.

	Name/Representing	Mailing Address	Contact Information
☐	Clayton Zuber Allen Keller Company		Phone No.: Cell No: 830-377-7691 Fax No.: E-mail: CZuber@allenkellerco.com
☐	Brandon Alcala Don Jackson Construction		Phone No.: Cell No: 214 790 5903 Fax No.: E-mail: info@djctx.com
☐			Phone No.: Cell No: Fax No.: E-mail:
☐			Phone No.: Cell No: Fax No.: E-mail:
☐			Phone No.: Cell No: Fax No.: E-mail:
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Modification to Item L-109 Airport Transformer Vault and Vault Equipment

Item L-109, "Airport Transformer Vault and Vault Equipment", of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Section 109-1.1., This section is voided in its entirety and replaced by the following:

"This item shall consist of furnishing and installing a new precast concrete vault, to fully meet these specifications in accordance with the design and dimensions shown in the plans. This work shall also consist of furnishing and installing the necessary electrical connections, breakers, regulator, system controls/wiring/cabinetry, power/control wiring, S-1 cutout, photocells, relays, enclosures, conduit, grounding system, automatic transfer switch, and all incidentals necessary to produce completed and working medium-intensity runway lighting (MIRL), precision approach path indicators (PAPI), beacon, and lighted wind cone systems. Also included in this work is the marking and labeling of equipment; the labeling or tagging of wires; the testing of the installation; coordination with the utility company; and the furnishing of all incidentals necessary to place the airfield lighting systems in operating condition as completed units to the satisfaction of the Engineer."

Section 109-3.2., "Concrete." The first paragraph is voided in its entirety and replaced with "The concrete for the foundations shall be proportioned, placed, and cured per TxDOT Item 360. Concrete shall be Class C."

Section 109-3.15., "Vault prefabricated metal housing." This section is voided in its entirety.

Section 109-3.16., "FAA-approved equipment." The following is removed from this section.

"AC 150/5345-13 Specification for L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits."

"AC 150/5345-56 Specification for L-890 Airport Lighting Control and Monitoring System (ALCMS)"

Section 109-3.17., "Other electrical equipment." The following is removed from this section.

"Distribution transformers, oil switches"

"of the existing systems or"

"rating whichever is greater"

Section 109-3.18.a., "Control circuits." The second sentence of this section is voided in its entirety.

Section 109-3.18.b., "Power circuits." The second item of this section is voided in its entirety.

Section 109-4.1., "General." "construct the transformer vault or prefabricated metal housing" is replaced by "install a new precast concrete vault" in the first paragraph.

Section 109-4.1., "General." The following is removed from the section:

"The metal housing shall be prefabricated equipment enclosure to be supplied in the size specified."

"or metal housing"

"(3m)"

"(12 mm per 0.3 m)"

"or metal housing"

Section 109-4.5., "Floor drain." This section is voided in its entirety.

Section 109-4.9., "Light and switches." "Provide lights and switches within the vault room as indicated in the plan." is added to the beginning of the first paragraph.

Section 109-4.9., "Light and switches." The last sentence of the paragraph is voided in its entirety.

Section 109-5.2., "Power supply equipment." The following is removed from the first paragraph:

"Transformers,"

"booster transformers,"

"as not to obstruct the oil sampling plugs of the oil filled units; and"

Section 109-5.2, "Power supply equipment." The following is removed from the second paragraph:

"or an emergency power generator"

"all equipment, accessories,"

"The emergency power generator set shall be the size and type specified."

Section 109-5.3., "Switchgear and panels." The following is removed from the section:

"Oil switches"

Section 109-6.2., This section is voided in its entirety.

Section 109-6.3., "vault" is added to the first paragraph.

Section 109-6.3., "within an existing vault or prefabricated metal housing" is removed from the end of the first paragraph.

Section 109-7.1., "or prefabricated metal housing" is removed from the first paragraph.

Section 109-7.1., Items L-109-7.1, L-109-7.2, L-109-7.3, and L-109-7.4 are replaced with the following:

"Item L-109-7.1 Furnish and Install Precast Concrete Electrical Vault on Concrete Foundation; Furnish and Install New Electrical Equipment and Place into Service All New Airfield Lighting Systems - per lump sum."

"Item L-109-7.2 Provide and Install 2.5kW 3-Step Ferroresonant L-828 CCR for MIRL Circuit - per lump sum."

Item L-109 Airport Transformer Vault and Vault Equipment

DESCRIPTION

109-1.1 ~~This item shall consist of [removing an existing airport transformer vault and equipment and;] constructing an airport transformer vault or a prefabricated metal housing per these specifications and per the design and dimensions shown in the plans. This work shall also include the installation of conduits in the floor and foundation, painting and lighting of the vault or metal housing, and the furnishing of all incidentals that are necessary to produce a completed unit. Included as a separate part under this item or as a separate item where an existing vault is to be used shall be the furnishing of all vault equipment, wiring, electrical buses, cable, conduit, potheads, and grounding systems. This work shall also include the painting of equipment and conduit; the marking and labeling of equipment and the labeling or tagging of wires; the testing of the installation; and the furnishing of all incidentals necessary to place it in operating condition as a completed unit to the satisfaction of the RPR.~~ **This item shall consist of furnishing and installing a new precast concrete vault, to fully meet these specifications in accordance with the design and dimensions shown in the plans. This work shall also consist of furnishing and installing the necessary electrical connections, breakers, regulator, system controls/wiring/cabinetry, power/control wiring, S-1 cutout, photocells, relays, enclosures, conduit, grounding system, automatic transfer switch, and all incidentals necessary to produce completed and working medium-intensity runway lighting (MIRL), precision approach path indicators (PAPI), beacon, and lighted wind cone systems. Also included in this work is the marking and labeling of equipment; the labeling or tagging of wires; the testing of the installation; coordination with the utility company; and the furnishing of all incidentals necessary to place the airfield lighting systems in operating condition as completed units to the satisfaction of the Engineer.**

EQUIPMENT AND MATERIALS

109-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be certified in AC 150/5345-53, Airport Lighting Equipment Certification Program (ALECP) and listed in the ALECP Addendum.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.

c. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the Engineer) and replaced with materials that comply with these specifications at the Contractor's cost.

d. All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project.

Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Contractor's submittals shall be **provided in electronic pdf format, tabbed by specification section.** The Engineer reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes, specified in this document.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least **twelve (12) months** from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

CONSTRUCTION OF VAULT AND PREFABRICATED METAL HOUSING

109-3.1 Electrical vault building. The electrical vault building must comply with NEC Article 110.31, Enclosure for Electrical Installations, Item (A) Electrical Vaults. Construct the building of materials having adequate structural strength for the conditions and installed location, has a minimum fire rating of two or three hours as determined by the authority having jurisdiction (AHJ), and is bullet resistant to minimum UL 752 Level 4.

109-3.2 Concrete. Concrete shall be proportioned, placed, and cured per TxDOT Item 360. Concrete shall be Class C.

109-3.3 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another Engineer approved third party certification program. Precast concrete structures shall conform to ASTM C478.

109-3.4 Reinforcing steel. Reinforcing steel bars shall be intermediate or structural grade deformed-type bars and shall be per ASTM A615.

109-3.5 Brick. Brick shall be per ASTM C62, Grade SW.

109-3.6 Rigid steel conduit. Rigid steel conduit and fittings shall be per Underwriters Laboratories Standards 6 and 514B.

109-3.7 Plastic Conduit and fittings. Plastic Conduit and fittings shall conform to the requirements of UL-651 and UL-654 schedule 40 polyvinyl chloride (PVC) suitable for use above or below ground.

109-3.8 Lighting. Vault or metal-housing light fixtures shall be of a vapor-proof type.

109-3.9 Outlets. Convenience outlets shall be heavy-duty duplex units designed for industrial service.

109-3.10 Switches. Vault or metal-housing light switches shall be single-pole switches.

109-3.11 Paint.

a. Priming paint for non-galvanized metal surfaces shall be a high solids alkyd primer compatible with the manufacturer's recommendations for the intermediate or topcoat.

b. White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint conforming to the Master Painter's Institute (MPI), Reference #9, Exterior Alkyd, Gloss.

c. Priming paint for wood surfaces shall be mixed on the job by thinning the specified white paint by adding 1/2 pint (0.24 liter) of raw linseed oil to each gallon (liter).

d. Paint for the floor, ceiling, and inside walls shall be per Porter Paint Company 69, 71, and 79 or equivalent. Walls and ceiling shall be light gray and the floor shall be medium gray.

e. The roof coating shall be hot asphalt material per ASTM D2823. Asbestos-free roof coating per ASTM D4479 may be substituted if required by local codes.

109-3.12 Ground bus. Ground bus shall be 1/8 × 3/4 inch (3 × 19 mm) minimum copper bus bar.

109-3.13 Square duct. Duct shall be square similar to that manufactured by the Square D Company (or equivalent), or the Trumbull Electric Manufacturing Company (or equivalent). The entire front of the duct on each section shall consist of hinged or removable cover for ready access to the interior. The cross-section of the duct shall be not less than 4 × 4 inch (100 × 100 mm) except where otherwise shown in the plans.

109-3.14 Ground rods. Ground rods shall be in accordance with Item L-108.

~~**109-3.15 Vault prefabricated metal housing.** The prefabricated metal housing shall be a commercially available unit.~~

109-3.16 FAA-approved equipment. Certain items of airport lighting equipment installed in vaults are covered by individual ACs listed below:

AC 150/5345-3	Specification for L-821, Panels for Remote Control of Airport Lighting
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10	Specification for Constant Current Regulators and Regulator Monitors
~~AC 150/5345-13~~	~~Specification for L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits.~~
AC 150/5345-49	Specification for L-854, Radio Control Equipment
~~AC 150/5345-56~~	~~Specification for L-890 Airport Lighting Control and Monitoring System (ALCMS)~~

109-3.17 Other electrical equipment. ~~Distribution transformers, oil switches, c~~**C**utouts, relays, terminal blocks, transfer relays, circuit breakers, and all other regularly used commercial items of electrical equipment not covered by FAA equipment specifications and ACs shall conform to the applicable rulings and standards of the Institute of Electrical and Electronic Engineers (IEEE) or the National Electrical Manufacturers Association (NEMA). When specified, test reports from a testing laboratory indicating that the equipment meets the specifications shall be supplied. In all cases, equipment shall be new and a first-grade product. This equipment shall be supplied in the quantities required for the specific project and shall incorporate the electrical and mechanical characteristics specified in the proposal and plans. Equipment selected and installed by the Contractor shall maintain the interrupting current rating ~~of the existing systems or~~ specified ~~rating whichever is greater~~.

109-3.18 Wire. Wire (in conduit) rated up to 5,000 volts shall be per AC 150/5345-7, Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits. For ratings up to 600 volts, moisture and heat resistant thermoplastic wire conforming to Commercial Item Description A-A-59544A Type THWN-2 shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the plans or in the proposal.

a. Control circuits. Unless otherwise indicated on the plans, wire shall be not less than No. 12 American wire gauge (AWG) and shall be insulated for 600 volts. ~~If telephone control cable is specified, No. 19 AWG telephone cable per ANSI/Insulated Cable Engineers Association (ICEA) S-85-625 specifications shall be used.~~

b. Power circuits.

(1) 600 volts maximum – Wire shall be No. 6 AWG or larger and insulated for at least 600 volts.

~~**(2)** 3,000 volts maximum – Wire shall be No. 6 AWG or larger and insulated for at least 3,000 volts.~~

(3) Over 3,000 volts-Wire shall be No. **8** ~~6~~ AWG or larger and insulated for at least the circuit voltage.

109-3.19 Short circuit / coordination / device evaluation / arc flash analysis. The Contractor shall, based upon the equipment provided, include as a part of the submittal process the electrical system "Short Circuit / Coordination / Device evaluation / Arc Flash Analysis". The analysis shall be performed by the equipment manufacturer and submitted in a written report. The analysis shall be signed and sealed by a registered professional Engineer from the state in which the project is located. The analysis shall comply with NFPA-70E and IEEE 1584.

The analysis will include: one line diagrams, short circuit analysis, coordination analysis, equipment evaluation, arc flash analysis and arc flash labels containing at a minimum, equipment name, voltage/current rating, available incident energy and flash protection boundary.

The selected firms field service Engineer shall perform data gathering for analysis completion and device settings, perform device setting as recommended by the analysis and will furnish and install the arc flash labels. The components worst case incident energy will be considered the available arc flash energy at that specific point in the system. Submit three written copies and one electronic copy of the report.

CONSTRUCTION METHODS

CONSTRUCTION OF VAULT ~~AND PREFABRICATED METAL HOUSING~~

109-4.1 General. The Contractor shall **install a new precast concrete vault** ~~construct the transformer vault or prefabricated metal housing~~ at the location indicated in the plans. Vault construction shall be reinforced concrete, concrete masonry, or brick wall as specified. ~~The metal housing shall be prefabricated equipment enclosure to be supplied in the size specified.~~ The mounting pad or floor details, installation methods, and equipment placement are shown in the plans. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another engineer approved third party certification program.

The Contractor shall clear, grade, and seed the area around the vault ~~or metal housing~~ for a minimum distance of 10 feet ~~(3 m)~~ on all sides. The slope shall be not less than 1/2 inch per foot ~~(12 mm per 0.3 m)~~ away from the vault ~~or metal housing~~ in all directions.

The vault shall provide adequate protection against weather elements, including rain, wind-driven dust, snow, ice and excessive heat. The vault shall have sufficient filtered ventilation, to assure that the interior room temperatures and conditions do not exceed the recommended limits of the electrical equipment to be installed in the vault. The Contractor is responsible for contacting the manufacturer of the equipment to be installed to obtain environmental limitations of the equipment to be installed. **Refer to the electrical vault detail plan sheets for construction requirements. The prefabricated building shall include roof, walls and floor in accordance with the details and these specifications.**

109-4.2 Foundation and walls.

a. Reinforced concrete construction. The Contractor shall construct the foundation and walls per the details shown in the plans. Unless otherwise specified, internal ties shall be of the mechanical type so that when the forms are removed the ends of the ties shall be at least one inch (25 mm) beneath the concrete surface; the holes shall be plugged and finished to prevent discoloration. Reinforcing steel shall be placed, as shown in the drawings, and secured in position to prevent displacement during the concrete placement.

The external surfaces of the concrete shall be thoroughly worked during the placing operation to force all coarse aggregate from the surface. Thoroughly work the mortar against the forms to produce a smooth finish free from air pockets and honeycomb.

The surface film of all pointed surfaces shall be removed before setting occurs. As soon as the pointing has set sufficiently, the entire surface inside and outside of the vault shall be thoroughly wet with water and rubbed with a No. 16 carborundum stone, or equivalent quality abrasive, bringing the surface to a paste. All form marks and projections shall be removed. The surface produced shall be smooth and dense without pits or irregularities. The materials which have been ground into a paste during the rubbing process shall be spread or brushed uniformly over the entire surface (except the interior surfaces that are to be painted shall have all paste removed by washing before painting) and permitted to reset. Final exterior finish shall be obtained by rubbing with No. 30 carborundum stone, or an equivalent quality abrasive. The surface shall be rubbed until the entire surface is smooth and uniform in color.

b. Brick and concrete construction. When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the plans. The outer edge of the foundation at the floor level shall be beveled 1-1/2 inches (38 mm) at 45 degrees. Brick walls shall be 8 inches (200 mm) thick, laid in running bond with every sixth course a header course. Brick shall be laid in cement mortar (one part masonry cement and 3 parts sand) with full mortar bed and shoved joints. All joints shall be completely filled with mortar, and facing brick shall be back-parged with mortar as work progresses. All joints shall be 3/8 inch (9 mm) thick, exterior joints tooled concave, and interior joints struck flush. Both interior and exterior brick surfaces shall be cleaned and nail holes, cracks and other defects filled with mortar. When specified, a nonfading mineral pigment mortar coloring shall be added to the mortar. Steel reinforcing bars, 3/8 inch (9 mm) in diameter and 12 inches (300 mm) long, shall be set vertically in the center of the brick wall on not more than 2 feet (60 cm) centers to project 2-1/2 inches (60 mm) into the concrete roof slab. Lintels for supporting the brickwork over doors, windows, and louvers shall consist of two $4 \times 3 \times 3/8$ inch ($100 \times 75 \times 9$ mm) steel angles. Lintels shall be painted with one coat of corrosion-inhibiting primer before installation, and all exposed parts shall be painted similar to doors and window sash after installation.

Window sills may be concrete poured in place or precast concrete as indicated in the plans. All exposed surfaces shall have a rubbed finish as specified under reinforced concrete construction. After completion, all interior and exterior faces of walls shall be scrubbed with a solution of muriatic acid and water in the proportions of not less than one part acid to 10 parts of water. All traces of efflorescence, loose mortar, and mortar stain shall be removed, and the walls washed down with clear water.

c. Concrete masonry construction. When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the plans. The concrete masonry units shall be standard sizes and shapes and shall conform to ASTM C90 and shall include the closures, jambs, and other shapes required by the construction as shown in the plans. Standard construction practice shall be followed for this type of work including mortar, joints, reinforcing steel for extensions into roof slab, etc. Plaster for interior walls, if specified, shall be Portland cement plaster.

109-4.3 Roof. The roof shall be reinforced concrete as shown in the plans. Reinforcing steel shall be placed as shown in the drawing and secured in position to prevent displacement during the pouring of the concrete. The concrete shall be poured monolithically and shall be free of honeycombs and voids. The

surface shall have a steel-troweled finish and shall be sloped as shown in the drawing. The underside of the roof slab shall be finished in the same manner as specified for walls.

One brush or mop coat of hot asphalt roof coating shall be applied to the top surface of the roof slab. The asphalt material shall be heated to within the range specified by the manufacturer and immediately applied to the roof. The finished coat shall be continuous over the roof surface and free from holidays and blisters. Smears and dribbles of asphalt on the roof edges and building walls shall be removed.

109-4.4 Floor. Construct building foundation in accordance with the details shown in the plans. The floor shall be reinforced concrete as shown in the drawings. When present, all sod, roots, refuse, and other perishable material shall be removed from the area under the floor to a depth of 8 inches (200 mm), unless a greater depth is specified in the invitation for bids. This area shall be backfilled with materials consisting of sand, cinders, gravel, or stone. Fill shall be placed in layers not to exceed 4 inches (100 mm) and shall be thoroughly compacted by tamping or rolling. A layer of building paper shall be placed over the fill prior to placing concrete. The floor surfaces shall have a steel-troweled finish. The floor shall be level unless a drain is specified, in which case the floor shall be pitched 1/4 inch (6 mm) per foot downward toward the drain. A 1/4-inch (6-mm) asphalt felt expansion joint shall be placed between floor and foundation walls. The floor shall be poured monolithically and shall be free of honeycombs and voids.

~~**109-4.5 Floor drain.** If shown in the plans, a floor drain and dry well shall be installed in the center of the floor of the equipment room. The dry well shall be excavated 4 × 4 feet (1.2 × 1.2 m) square and to a depth of 4 feet (1.2 m) below the finished floor elevation and shall be backfilled to the elevation of the underside of the floor with gravel - which shall all pass a 2-inch (50 mm) mesh sieve and shall all be retained on a 1/4-inch (6.3 mm) mesh sieve. The gravel backfill shall be placed in 6-inch (150 mm) maximum layers, and the entire surface of each layer shall be tamped either with a mechanical tamper or with a hand tamper weighing not less than 25 pounds (11 kg) and having a face area of not more than 36 square inches (232 square cm) nor less than 16 square inches (103 square cm). The drain inlet shall be set flush in the concrete floor. The drain shall have a clear opening of not less than 8 inches (200 mm) in diameter.~~

109-4.6 Conduits in floor and foundation. Conduits shall be installed in the floor and through the foundation walls per the details shown in the plans. All underground conduit shall be painted with an asphalt compound. Conduit shall be installed with a coupling or metal conduit adapter flush with the top of the floor. All incoming conduit shall be closed with a pipe plug to prevent the entrance of foreign material during construction. Space conduit entrances shall be left closed.

109-4.7 Doors. Doors shall be metal-clad fireproof Class A (three (3) hour rated) doors conforming to requirements of the National Electrical Code (NEC) and local electrical codes. Panic bar exit hardware shall be installed per NEC requirements. Refer to the new electrical vault detail plan sheets for construction requirements.

109-4.8 Painting. The floor, ceiling, and inside walls of concrete construction shall first be given a hardening treatment, after which the Contractor shall apply two coats of paint as specified below, except that interior face brick walls need not be painted. The hardening treatment shall consist of applying two coats of either a commercial floor hardener or a solution made by dissolving 2 pounds (0.9 kg) of magnesium fluorosilicate or zinc sulfate crystals in one gallon (liter) of water. Each coat shall be allowed to dry at least 48 hours before the next application. After the second treating coat has dried, the surfaces shall be brushed clean of all crystals and thoroughly washed with clear water. Paint for walls and ceiling shall be a light gray color approved by the RPR. The floor paint shall be a medium gray color approved by the RPR. Before painting, the surfaces shall be dry and clean. The first coat shall be thinned by adding 2/3-quart (0.63 liters) of spar varnish and 1/3-quart (0.31 liters) of turpentine to each gallon (liter) of paint. The second coat shall be applied without thinning. All doors, lintels, and windows shall be cleaned to remove any rust or foreign material and shall be given one body and one finish coat of white paint.

Bare metal surfaces shall be given a prime coat of corrosion-inhibiting primer prior to the body and finish coats.

109-4.9 Lights and switches. Provide lights and switches within the vault room as indicated in the plans. The Contractor shall furnish and install a minimum of two duplex convenience outlets in the vault room. ~~Where a control room is specified, at least two duplex outlets shall be installed.~~

INSTALLATION OF EQUIPMENT IN VAULT ~~OR PREFABRICATED METAL HOUSING~~

109-5.1 General. The Contractor shall furnish, install, and connect all equipment, equipment accessories, conduit, cables, wires, buses, grounds, and support necessary to ensure a complete and operable electrical distribution center for the airport lighting system as specified herein and shown in the plans. When specified, an emergency power supply and transfer switch shall be provided and installed.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and local code agency having jurisdiction. All electrical work shall comply with the NEC and local code agency having jurisdiction including the separation of under 600V work from 5,000V work."

109-5.2 Power supply equipment. ~~Transformers, r~~**R**egulators, ~~booster transformers,~~ and other power supply equipment items shall be furnished and installed at the location shown in the plans or as directed by the Engineer. The power supply equipment shall be set on steel "H" sections, "I" beams, channels, or concrete blocks to provide a minimum space of 1-1/2 inch (38 mm) between the equipment and the floor. The equipment shall be placed so ~~as not to obstruct the oil-sampling plugs of the oil-filled units; and~~ name-plates shall, so far as possible, not be obscured.

If specified in the plans and specifications, equipment for an alternate power source ~~or an emergency power generator~~ shall be furnished and installed. The alternate power supply installation shall include ~~all equipment, accessories,~~ an automatic changeover switch, and all necessary wiring and connections. ~~The emergency power generator set shall be the size and type specified.~~

109-5.3 Switchgear and panels. ~~Oil switches,~~ fused cutouts, relays, transfer switches, panels, panel boards, and other similar items shall be furnished and installed at the location shown in the plans or as directed by the Engineer. Wall or ceiling mounted items shall be attached to the wall or ceiling with galvanized bolts of not less than 3/8-inch (9 mm) diameter engaging metal expansion shields or anchors in masonry or concrete vaults.

109-5.4 Duct and conduit. The Contractor shall furnish and install square-type exposed metallic ducts with hinged covers for the control circuits in the vault. These shall be mounted along the walls behind all floor-mounted equipment and immediately below all wall-mounted equipment. The hinged covers shall be placed to open from the front side with the hinges at the front bottom.

Wall brackets for square ducts shall be installed at all joints 2 feet (60 cm) or more apart with intermediate brackets as specified. Conduit shall be used between square ducts and equipment or between different items of equipment when the equipment is designed for conduit connection. When the equipment is not designed for conduit connection, conductors shall enter the square-type control duct through insulating bushings in the duct or on the conduit risers.

109-5.5 Wiring and connections. The Contractor shall make all necessary electrical connections in the vault per the wiring diagrams furnished and as directed by the Engineer. In wiring to the terminal blocks, the Contractor shall leave sufficient extra length on each control lead to make future changes in connections at the terminal block. This shall be accomplished by running each control lead the longest way around the box to the proper terminal. Leads shall be neatly laced in place.

109-5.6 Marking and labeling. All equipment, control wires, terminal blocks, etc., shall be tagged, marked, or labeled as specified below:

a. Wire identification. The Contractor shall furnish and install self-sticking wire labels or identifying tags on all control wires at the point where they connect to the control equipment or to the terminal blocks. Wire labels, if used, shall be of the self-sticking preprinted type and of the manufacturer's recommended size for the wire involved. Identification -markings designated in the plans shall be followed. Tags, if used, shall be of fiber not less than 3/4 inch (19 mm) in diameter and not less than 1/32 inch (1 mm) thick. Identification markings designated in the plans shall be stamped on tags by means of small tool dies. Each tag shall be securely tied to the proper wire by a nonmetallic cord.

b. Labels. The Contractor shall stencil identifying labels on the cases of regulators, breakers, and distribution and control relay cases with white oil paint as designated by the Engineer. The letters and numerals shall be not less than one inch (25 mm) in height and shall be of proportionate width. The Contractor shall also mark the correct circuit designations per the wiring diagram on the terminal marking strips, which are a part of each terminal block.

METHOD OF MEASUREMENT

109-6.1 The quantity of vaults to be paid for under this item shall consist of the number of vaults constructed in place and accepted as a complete unit.

~~**109-6.2** The quantity of prefabricated metal housings to be paid for under this item shall consist of the number of housings constructed in place and accepted as a complete unit.~~

109-6.3 The quantity of **vault** equipment to be paid for under this item shall consist of all equipment installed, connected and accepted as a complete unit ready for operation ~~within an existing vault or prefabricated metal housing~~.

BASIS OF PAYMENT

109-7.1 Payment will be made at the contract unit price for each completed and accepted vault ~~or prefabricated metal housing~~ equipment installation. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item L-109-7.1	**Furnish and Install Precast Concrete Electrical Vault on Concrete Foundation; Furnish and Install New Electrical Equipment and Place into Service All New Airfield Lighting Systems - per lump sum.**
Item L-109-7.2	**Provide and Install 2.5kW 3-Step Ferroresonant L-828 CCR for MIRL Circuit - per lump sum.**

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.

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-3	Specification for L-821, Panels for Remote Control of Airport Lighting
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10	Specification for Constant Current Regulators and Regulator Monitors
AC 150/5345-13	Specification for L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits
AC 150/5345-49	Specification L-854, Radio Control Equipment;
AC 150/5345-53	Airport Lighting Equipment Certification Program

American National Standards Institute / Insulated Cable Engineers Association (ANSI/ICEA)

ANSI/ICEA S-85-625	Standard for Telecommunications Cable Aircore, Polyolefin Insulated, Copper Conductor Technical Requirements

ASTM International (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM C62	Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C90	Standard Specification for Loadbearing Concrete Masonry Units
ASTM D2823	Standard Specification for Asphalt Roof Coatings, Asbestos Containing
ASTM D4479	Standard Specification for Asphalt Roof Coatings – Asbestos-Free

Commercial Item Description (CID)

A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation) Institute of Electrical and Electronic Engineers (IEEE)
IEEE 1584	Guide for Performing Arc-Flash Hazard Calculations

Master Painter's Institute (MPI)

MPI Reference #9	Alkyd, Exterior, Gloss (MPI Gloss Level 6)

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit – Steel
UL Standard 514B	Conduit, Tubing, and Cable Fittings
UL Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)
NFPA-70E	Standard for Electrical Safety in the Workplace
NFPA-780	Standard for the Installation of Lightning Protection Systems

END OF ITEM L-109

ITEM SS-300 AUTOMATIC TRANSFER SWITCH

(Non-Standard FAA Specification)

DESCRIPTION

300-1.1 This item shall consist of furnishing and installing an automatic transfer switch per these specifications and per the design and detail shown in the plans. This shall be included as a part of the new precast concrete vault.

The work shall include the furnishing and installation of a support for the automatic transfer switch and the specified interconnecting wire. The item shall also include all cable connections, conduit and conduit fittings, the testing of the installation, and all incidentals necessary to place the automatic transfer switch in operation (as a completed unit) to the satisfaction of the Engineer.

EQUIPMENT AND MATERIALS

300-2.1 GENERAL.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the Engineer) and replaced with materials that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. **The Contractor's submittals shall be in electronic pdf format, tabbed by specification section.** The Engineer reserves the right to reject any and all equipment, materials or procedures, that do not meet the system design and the standards and codes, specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least **twelve (12) months** from the date of final

acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

300-2.2 MANUFACTURER. The automatic transfer switch shall be as manufactured by Cummins Power Generation X-Series, Kohler KEP, ASCO 7000, amps as indicated on the drawings, or equal.

a. Interlocked molded case circuit breakers or contactors are not acceptable.

b. The transfer switch shall be capable of switching all classes of load and shall be rated for continuous duty when installed in a nonventilated enclosure constructed in accordance with Underwriters Laboratories, Inc., UL 1008. The transfer switch shall be provided with a NEMA 1 enclosure.

300-2.3 CONSTRUCTION AND PERFORMANCE.

a. The transfer switch shall be double-throw, actuated by a single electrical operator momentarily energized and connected to the transfer mechanism by a simple overcenter linkage, with a minimum transfer time of 400 milliseconds.

b. The transfer switch shall have the ability to detect under and over-voltage, under and over-frequency, voltage imbalance, incorrect phase rotation, and phase loss.

c. The time delay between the opening of the closed contacts and the closing of the open contacts shall allow for voltage decay before transfer.

d. The transfer switch shall allow the motor and transformer loads to be reenergized after transfer with normal inrush current. The transfer switch shall be capable of transferring successfully in either direction with 70% of rated voltage applied to the switch terminals.

e. The normal and emergency contacts shall be positively interlocked mechanically and electrically to prevent simultaneous closing. Main contacts shall be mechanically locked in position in both the normal and standby positions without the use of hooks, latches, magnets, or springs and shall be silver tungsten alloy. All contacts shall be 100% rated. Separate arcing contacts with magnetic blowouts shall be provided on all transfer switches.

f. The transfer switch shall be equipped with a safe manual operator designed to prevent injury to operating personnel. The manual operator shall provide the same transfer speed as the electrical operator to prevent a flashover from switching the main contacts slowly.

g. The transfer switch shall be equipped with a digital display that has the ability to monitor load power conditions, network status, review transfer switch events, and adjust transfer switch parameters. The display shall also include a bar graph display that indicates the level of power being supplied to the load as well as three-phase voltage, current, frequency, power factor, and kilowatts.

300-2.4 SEQUENCE OF OPERATION.

a. Engine starting contacts shall be provided to start the future generating plant should the voltage of the normal source drop below 80% on any phase after an adjustable time delay to allow for momentary dips. The transfer switch shall transfer to standby when 90% of rated voltage and frequency has been reached. After restoration of normal power on all phases to 90% of rated voltage, an adjustable time delay period of zero to 31 minutes shall delay retransfer to allow stabilization of normal power. If the standby

power source should fail during this time delay period, the switch shall automatically return to the normal source. After retransfer to normal, the engine-generator shall be allowed to operate at no-load for a period of 5 minutes. Two auxiliary contacts rated 25 amps, 120 volts shall be mounted on the main shaft; one closed on normal, the other closed on standby. All relays, timers, control wiring, and accessories shall be front accessible. In addition, one set of relay contacts shall be provided to open upon loss of the normal power supply. All control wire terminations shall be identified by tubular sleeve-type markers.

b. The automatic transfer switch shall include the following functions. Adjustable time delays and features described below shall be operator-adjustable from the front of the transfer switch and shall not require the use of a laptop, software, or external programming device.

1. Time delay to override momentary normal source power outages to delay engine start signal and transfer switch operation. Adjustable 0.5 to 90 seconds.

2. Time delay relays to control contact transition time on transfer to either source, adjustable 1 to 300 seconds (Programmed Transition).

3. Time delay on retransfer to normal. Adjustable 0 to 31 minutes, with engine overrun to provide fixed 5-minute unloaded engine operation after retransfer to normal.

4. Test with load-Auto-Test without load selector switch to simulate normal power failure. (Maintained Type).*

5. Contact to close on failure of normal source to initiate engine starting or other customer functions.

6. Contact to open on failure of normal source to initiate engine starting or other customer functions.

7. Green pilot light to indicate switch in normal position.*

8. Red pilot light to indicate switch in standby position.*

9. Auxiliary contact closed in normal position.

10. Auxiliary contact closed in standby position.

11. Adjustable relay to prevent transfer to standby until voltage and frequency of generating plant have reached acceptable limits.

12. Plant exerciser with 7-day time clock, multiple test schedules, and programmable exceptions for holidays, weekends, etc.

* Front cabinet door mounted.

c. The short circuit withstand capability for the automatic transfer switch shall be at or above the minimum required for the project, when coordinated with the upstream molded case circuit breaker. Contractor shall confirm available fault current with electric utility company and provide automatic transfer switch with appropriate short circuit withstand rating.

d. During the withstand tests, there shall be no contact welding or damage. The tests shall be performed on identical samples without the use of current limiting fuses. Oscillograph traces across the main contact shall verify that contact separation has not occurred. These procedures shall be in accordance with UL 1008 and testing shall be certified by Underwriters Laboratories or any nationally recognized independent testing laboratory.

e. When conducting temperature rise tests to UL 1008, the manufacturer shall include postendurance temperature rise tests to verify the ability of the transfer switch to carry full-rated current after completing the overload and endurance tests.

f. As a precondition for approval, the manufacturer of the automatic transfer switch shall verify that the switches are listed by Underwriters Laboratories, Inc., UL 1008 with withstand and close-in values at least equal to the interrupting rating of the circuit breaker and/or fuse that is specified to protect the circuit.

CONSTRUCTION METHODS

300-3.1 GENERAL.

a. Provide complete automatic transfer switch as shown on the Drawings.

300-3.2 INSTALLATION.

a. The installation of this system shall comply with the directions and recommendations of authorized factory representatives. These representatives shall offer the supervision necessary for proper installation.

b. A final inspection and an initial start-up of the system shall be provided by the factory representatives.

c. A Certificate of Proper Installation shall be provided by the authorized factory representatives which states that the system is properly installed and does properly function as recommended by the factory and as described herein shall be submitted to ENGINEER and OWNER. The Manufacturer’s certification of proper installation shall state that proper adjustments have been made and that the equipment or system is ready for start-up.

d. A test run shall be performed by the authorized factory representatives in the presence of CONTRACTOR and ENGINEER or their representatives to demonstrate correct operation and programming of the automatic transfer switch; the time of this test run shall be mutually agreed upon by all persons concerned. A temporary generator shall be provided to perform this testing.

300-3.3 START-UP AND TRAINING.

a. CONTRACTOR shall include 8 hours of start-up by a certified, factory-trained engineer. Start-up services shall include, but not be limited to, inspection of CONTRACTOR installation and functional testing of the ATS assembly. On-site time shall be over and above the cost of travel and travel time to the site. A temporary generator shall be provided to perform this testing.

b. CONTRACTOR shall provide a training session for up to three OWNER's representatives for one normal workday (not including start-up) at a job site location determined by OWNER. The training session shall be conducted by a manufacturer's qualified representative. The training program shall consist of instruction on operation and testing of the assembly, simulated outages, and review of major components within the assembly.

METHOD OF MEASUREMENT

300-4.1 The quantity of automatic transfer switches shown on the drawings shall be paid for under Item L-109 and shall consist of the automatic transfer switch, connected and accepted with the other equipment installed under this item.

BASIS OF PAYMENT

300-5.1 Payment will be made under:

Item L-109-7.1	Furnish and Install Precast Concrete Electrical Vault on Concrete Foundation; Furnish and Install New Electrical Equipment and Place into Service All New Airfield Lighting Systems - per lump sum.

END OF ITEM

Section 341.6.3., "Total Adjusted Pay (TAP) Calculation." The paragraph is supplemented by the following:

"No payment for Dense-Graded Hot-Mix Asphalt (HMA) shall be greater than 100 percent. However, payment in excess of 100 percent for any given accepted lot of HMA shall be used to offset payment for accepted lots of HMA that achieve a lot pay factor less than 100 percent. Tonnage amounts attributable to pavement mat thicknesses outside of the +/- 1/4-inches tolerance shall not be included in the TAP Calculation. The Design pavement mat thickness plus tolerance thickness will be included in the TAP Calculation."

ITEM NO.	FAA or TxDOT ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	FINAL QUANTITY
BASE BID–REPLACE LIRL SYSTEM WITH LED MIRL SYSTEM INCLUDING LED GUIDANCE SIGNS; REPLACE ELECTRICAL VAULT; REPLACE PAPI SYSTEM (BOTH RW ENDS); REPLACE BEACON AND BEACON TOWER WITH LED BEACON AND TIP-DOWN TOWER; REMOVE EX. WIND CONE; REPLACE EX. WIND CONE AND SEGMENTED CIRCLE; RECONSTRUCT RW 17-35; RECONSTRUCT TW A; RECONSTRUCT CROSS TWs; REMOVE EX. CROSS TW.					
1.	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	LS	1	
2.	C-105	Mobilization	LS	1	
3.	Special	Install RW Closure Markers	LS	1	
4.	SS-G-700	Remove and Dispose of Existing Stake-Mounted RW Threshold Lighting Fixture	EA	16	
5.	SS-G-700	Remove and Dispose of Existing Stake-Mounted RW Edge Lighting Fixture	EA	38	
6.	SS-G-700	Remove and Dispose of Existing Lighted Wind Cone (Including Concrete Foundation)	EA	1	
7.	SS-G-700	Remove and Dispose of Existing Unlighted Wind Cone (Including Concrete Foundation)	EA	1	
8.	SS-G-700	Remove and Dispose of Existing Segmented Circle	LS	1	
9.	SS-G-700	Remove and Dispose of Existing Pad-Mounted PAPI System (Including Concrete Foundation)	EA	2	
10.	SS-G-700	Remove and Dispose of Existing Guidance Sign (Including Concrete Foundation)	EA	10	
11.	SS-G-700	Remove and Dispose of Existing Beacon and Beacon Tower	LS	1	
12.	SS-G-700	Remove and Dispose of Existing Electrical Vault	LS	1	
13.	L-101	L-801A(L) LED Medium-Intensity Rotating Beacon	EA	1	
14.	L-103	Tipdown Beacon Tower and Foundation	EA	1	
15.	L-107	Segmented Circle Marker System	LS	1	
16.	L-107	L-807(L) 12-Foot Internally-Lit LED Wind Cone with L-810 LED Obstruction Light and Foundation	EA	1	
17.	L-108	No. 6 AWG, Solid, Bare Counterpoise Wire, Installed in Trench, Above the Conduit, Including Ground Rods and Ground Connectors	LF	12,950	
18.	L-108	No. 8 Type C, 600V Power Cables and No. 8 XHHW, 600V Ground, Installed in Conduit, for PAPIs	LF	4,755	
19.	L-108	No. 8 Type C, 600V Power Cables and No. 8 XHHW, 600V Ground, Installed in Conduit, for Beacon	LF	45	
20.	L-108	No. 8 Type C, 5kV, L-824 Power Cable, Installed in Conduit, for MIRL Circuit	LF	11,030	
21.	L-109	Furnish and Install Precast Concrete Electrical Vault on Concrete Foundation; Furnish and Install New Electrical Equipment and Place into Service All New Airfield Lighting Systems	LS	1	
22.	L-109	Provide and Install 2.5kW 3-Step Ferroresonant L-828 CCR for MIRL Circuit	LS	1	
23.	L-110	Non-Encased, Electrical PVC Conduit (Type 1), 2-Inch in a Single Trench	LF	11,440	
24.	L-110	Non-Encased, Electrical PVC Conduit (Type 1), Two 2-Inch in a Single Trench	LF	1,425	
25.	L-110	Concrete-Encased Electrical Duct Bank, 1-Way 4-Inch C	LF	60	
26.	L-110	Concrete-Encased Electrical Duct Bank, 2-Way 4-Inch C	LF	373	
27.	L-115	L-867 Can (Size B) (In Concrete) for Junction Box	EA	28	
28.	L-125	Retroreflective Markers (L-853)(Type I)(Style II)	EA	34	
29.	L-125	L-861(L) Base-Mounted MIRL with L-867 Junction Box (Size B)	EA	40	
30.	L-125	L-861SE(L) Base-Mounted MIRL with L-867 Junction Box (Size B)	EA	16	
31.	L-125	L-858(L) Base Mounted Guidance Sign (Size 1) (1 Module)	EA	4	
32.	L-125	L-858(L) Base Mounted Guidance Sign (Size 1) (2 Module)	EA	2	
33.	L-125	L-858(L) Base Mounted Guidance Sign (Size 1) (3 Module)	EA	1	
34.	L-125	L-881(L) PAPI (Style A)(Class 1)(2 Unit)(3- or 4-Leg)(Including Concrete Foundation)	EA	2	
35.	L-125	PAPI Integrated Digital Level With Personalized Instructions in Kit Usage	LS	1	
36.	P-620	Reflectorized Pavement Marking	SF	29,150	
37.	P-620	Non-Reflectorized Pavement Marking	SF	550	
38.	TxDOT 104	Remove and Dispose of Existing Concrete	SY	48	
39.	TxDOT 105	Removing Treated and Untreated Base and Asphalt Pavement	SY	54,850	
40.	TxDOT 160	Furnishing and Placing Topsoil (4-inches)	SY	35,895	
41.	TxDOT 162	Block Sodding	SY	3,950	
42.	TxDOT 164	Broadcast Seeding (Permanent) (Rural)	SY	35,895	
43.	TxDOT 247	Flexible Base (6 Inch) (Type A, Grade 1-2)	SY	57,450	
44.	TxDOT 250	Geogrid Base Reinforcement (Type 2, Triaxial)	SY	57,450	
45.	TxDOT 310	Prime Coat (MC-30 at 0.15 gal/sy)	GAL	8,035	
46.	TxDOT 341	Dense-Graded HMA (PG64-22) (Type C) (3 Inches)	TON	9,580	
47.	TxDOT 464	15-Inch Reinforced Concrete Pipe (Class III)	LF	240	
48.	TxDOT 464	18-Inch Reinforced Concrete Pipe (Class III)	LF	445	
49.	TxDOT 467	15-Inch Reinforced Concrete Pipe Safety End Treatment (TY II)(4:1)(C)	EA	2	
49.	TxDOT 467	18-Inch Reinforced Concrete Pipe Safety End Treatment (TY II)(4:1)(C)	EA	6	
51.	TxDOT 496	Remove and Dispose of Reinforced Concrete Pipe	LF	685	

ITEM NO.	FAA or TxDOT ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	FINAL QUANTITY
ALTERNATE BID NO. 1–RECONSTRUCT HANGAR ACCESS RW AND APRON					
A1.1.	Special	Tie Down Anchor	EA	45	
A1.2.	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	LS	1	
A1.3.	L-125	Retroreflective Markers (L-853)(Type I)(Style II)	EA	38	
A1.4.	P-620	Reflectorized Pavement Marking	SF	1,500	
A1.5.	TxDOT 105	Removing Treated and Untreated Base and Asphalt Pavement	SY	15,200	
A1.6.	TxDOT 160	Furnishing and Placing Topsoil (4-inches)	SY	1,280	
A1.7.	TxDOT 162	Block Sodding	SY	290	
A1.8.	TxDOT 164	Broadcast Seeding (Permanent) (Rural)	SY	1,280	
A1.9.	TxDOT 247	Flexible Base (6 Inch) (Type A, Grade 1-2)	SY	18,130	
A1.10.	TxDOT 250	Geogrid Base Reinforcement (Type 2, Triaxial)	SY	18,130	
A1.11.	TxDOT 310	Prime Coat (MC-30 at 0.15 gal/sy)	GAL	2,280	
A1.12.	TxDOT 341	Dense-Graded HMA (PG64-22) (Type C) (3 Inches)	TON	2,510	

1

PAY ITEM NOTES:

1. FAA/TXDOT ITEMS DENOTED AS "SPECIAL" REFERENCE PLAN SHEET DETAILS AND/OR NOTES ONLY, AND DO NOT REFERENCE ANY SPECIFICATION INCLUDED IN THE CONTRACT DOCUMENTS.
2. ITEMS NOT SPECIFICALLY LISTED ON THE BID FORM ARE CONSIDERED SUBSIDIARY TO RELATED ITEMS OF WORK.

STATE OF TEXAS
JARED DAVID ENGELKE
138204
LICENSED
PROFESSIONAL ENGINEER
4.22.2026

NO.	REVISIONS	DATE
1.	ADDENDUM NO. 1	4.22.26

PROJECT QUANTITIES

CARTHAGE, TEXAS
PANOLA COUNTY AIRPORT - SHARPE FIELD
2026 AIRPORT ELECTRICAL AND PAVEMENT IMPROVEMENTS

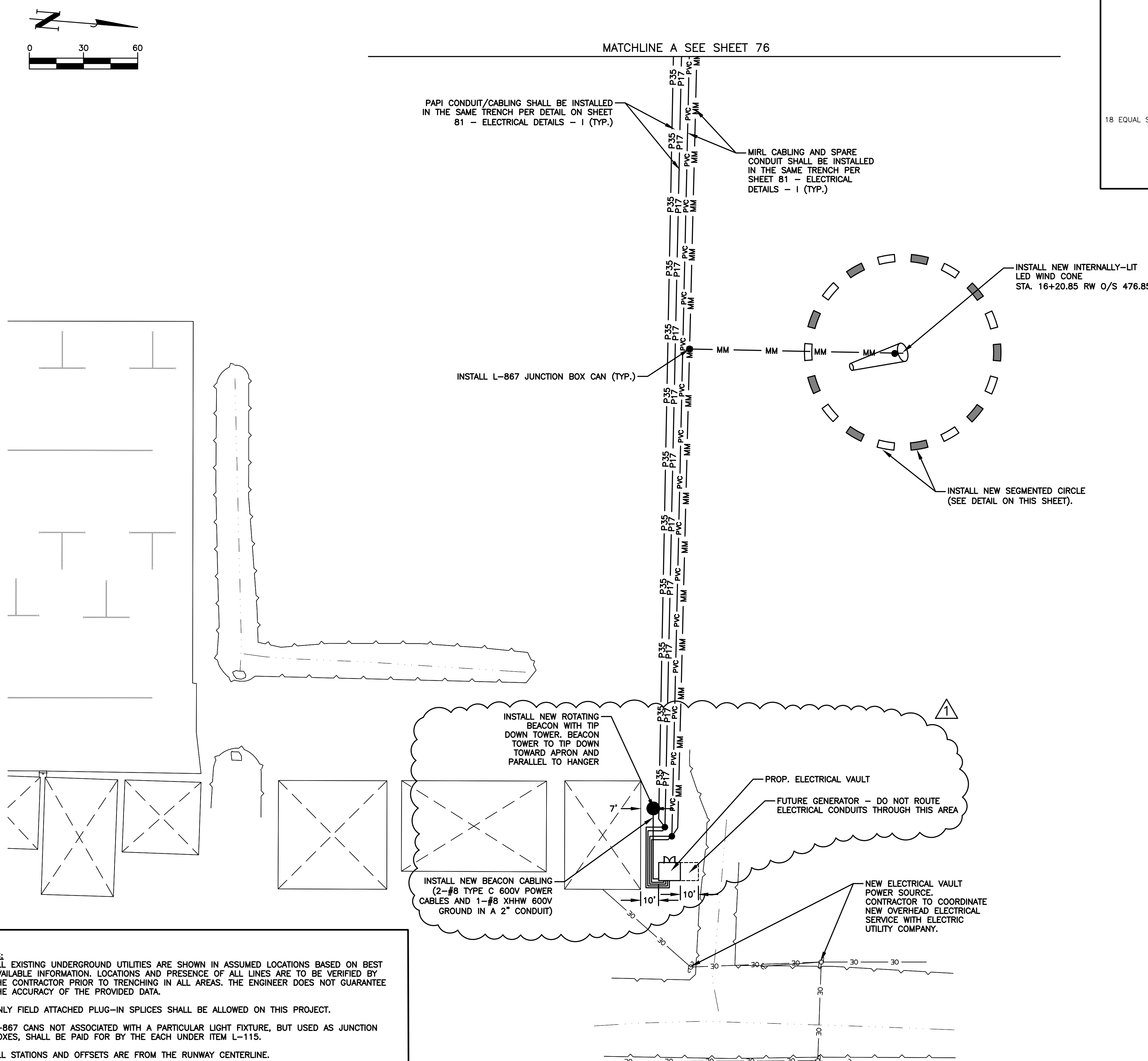
JOB NO. 1174.001

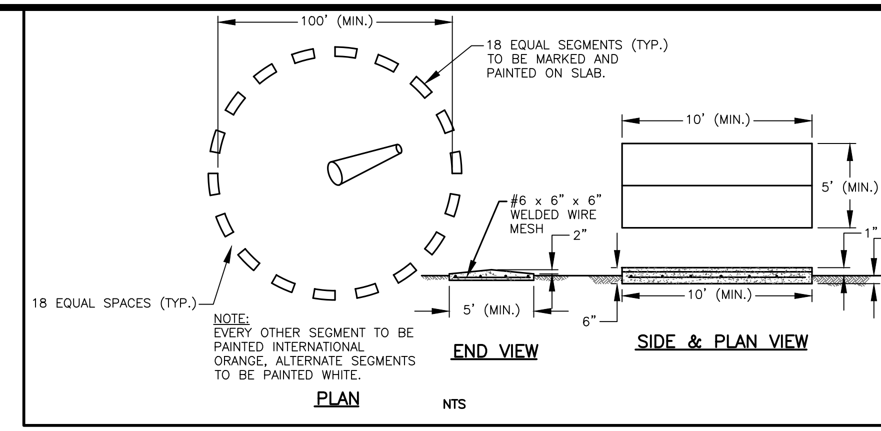
PROJECT MGR. JRE

TBPE No. F-8405

STRAND ASSOCIATES®

SHEET 5





NOTES:
1. ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN ASSUMED LOCATIONS BASED ON BEST AVAILABLE INFORMATION. LOCATIONS AND PRESENCE OF ALL LINES ARE TO BE VERIFIED BY THE CONTRACTOR PRIOR TO TRENCHING IN ALL AREAS. THE ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THE PROVIDED DATA.
2. ONLY FIELD ATTACHED PLUG–IN SPLICES SHALL BE ALLOWED ON THIS PROJECT.
3. L–867 CANS NOT ASSOCIATED WITH A PARTICULAR LIGHT FIXTURE, BUT USED AS JUNCTION BOXES, SHALL BE PAID FOR BY THE EACH UNDER ITEM L–115.
4. ALL STATIONS AND OFFSETS ARE FROM THE RUNWAY CENTERLINE.
5. CONTRACTOR SHALL REMOVE AND DISPOSE OF ANY EQUIPMENT NOT DESIGNATED FOR SALVAGE.

CABLE LEGEND

——M——M——	INSTALL NEW MIRL CABLING (1–#8 TYPE C 5KV POWER CABLE IN A 2" PVC CONDUIT) AND 1–#6 BARE SOLID COPPER COUNTERPOISE, ALL IN A SINGLE TRENCH
—— MM —— MM ——	INSTALL NEW MIRL CABLING (2–#8 TYPE C 5KV POWER CABLES IN A 2" PVC CONDUIT) AND 1–#6 BARE SOLID COPPER COUNTERPOISE*, ALL IN A SINGLE TRENCH UNLESS OTHERWISE NOTED.
—— P17 ——	NEW RW 17 END PAPI CABLING (2–#8 TYPE C 600V POWER CABLES AND 1–#8 XHHW 600V GROUND IN A 2" CONDUIT) AND 1–#6 BARE SOLID COPPER COUNTERPOISE*, ALL IN A SINGLE TRENCH UNLESS OTHERWISE NOTED.
—— P35 ——	NEW RW 35 END PAPI CABLING (2–#8 TYPE C 600V POWER CABLES AND 1–#8 XHHW 600V GROUND IN A 2" CONDUIT) AND 1–#6 BARE SOLID COPPER COUNTERPOISE*, ALL IN A SINGLE TRENCH UNLESS OTHERWISE NOTED.
——●——	INSTALL NEW L–867 CAN (SIZE B) (IN CONCRETE) FOR JUNCTION BOX.
—— PVC —— PVC ——	SPARE 2" CONDUIT

*NOTE: WHERE CABLES ARE IN A SHARED TRENCH, ONLY (1) COUNTERPOISE WIRE MAY BE REQUIRED, PER SPECIFICATION AND DETAIL ON SHEET 81. ONLY ONE COUNTERPOISE WIRE WILL BE PAID WHERE THIS IS THE CASE, AS DETERMINED BY THE ENGINEER.

STATE OF TEXAS
RICHARD GERARD THIMM
123925
LICENSED
PROFESSIONAL ENGINEER
Exp 6/30/26
4/22/26

REVISIONS

NO.		DATE:
1.	ADDENDUM NO. 1	4.22.26

ELECTRICAL PLAN - III

CARTHAGE, TEXAS
PANOLA COUNTY AIRPORT - SHARPE FIELD
2026 AIRPORT ELECTRICAL AND PAVEMENT IMPROVEMENTS

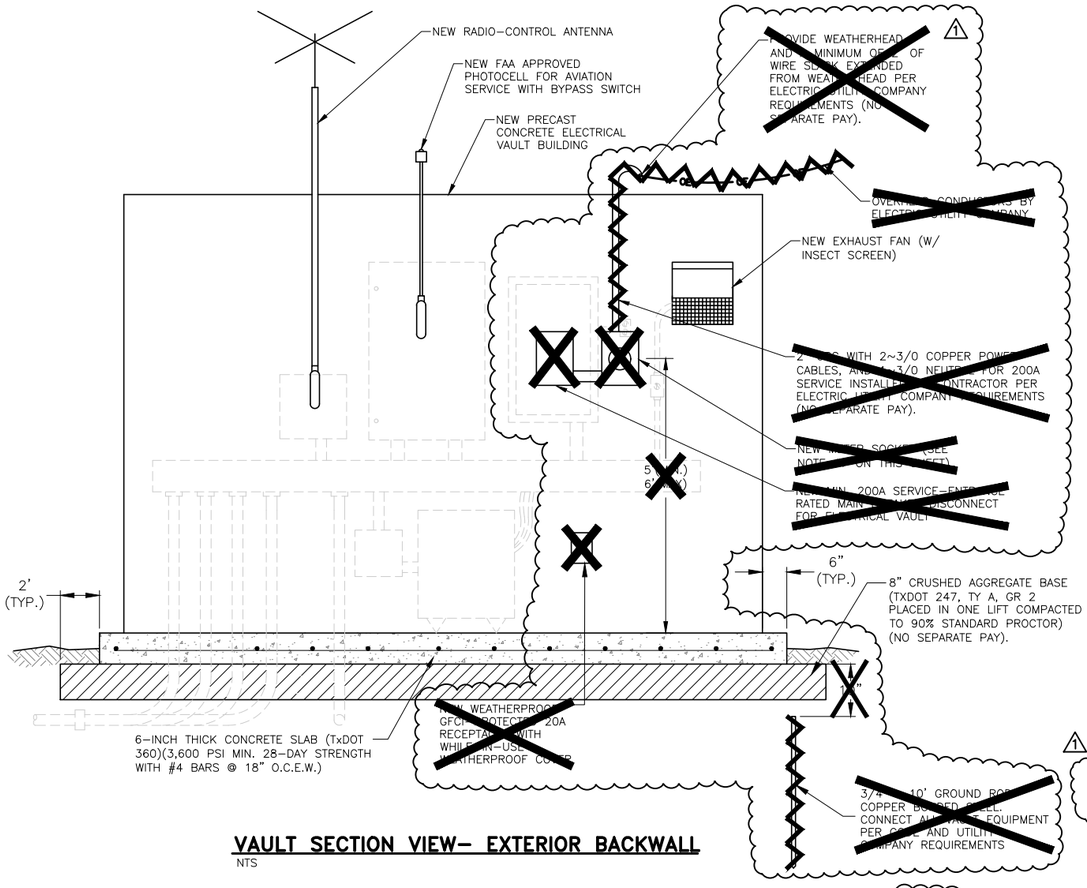
JOB NO.
1174.001

PROJECT MGR.
JRE

TBPE No. F-8405

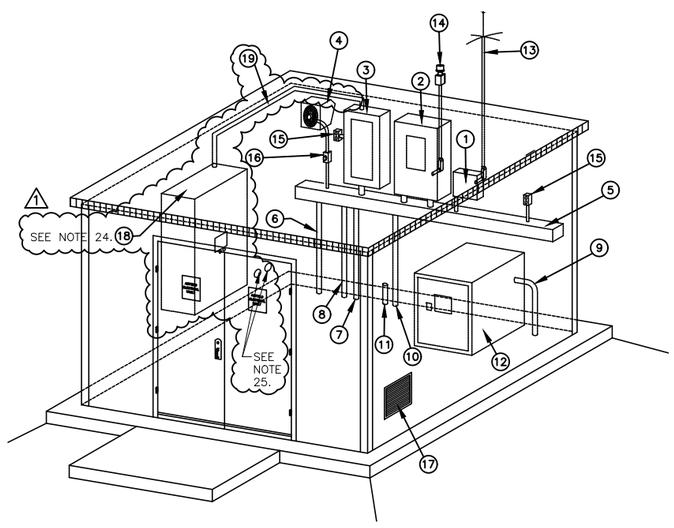
STRAND ASSOCIATES®

SHEET
77



VAULT SECTION VIEW– EXTERIOR BACKWALL

NTS

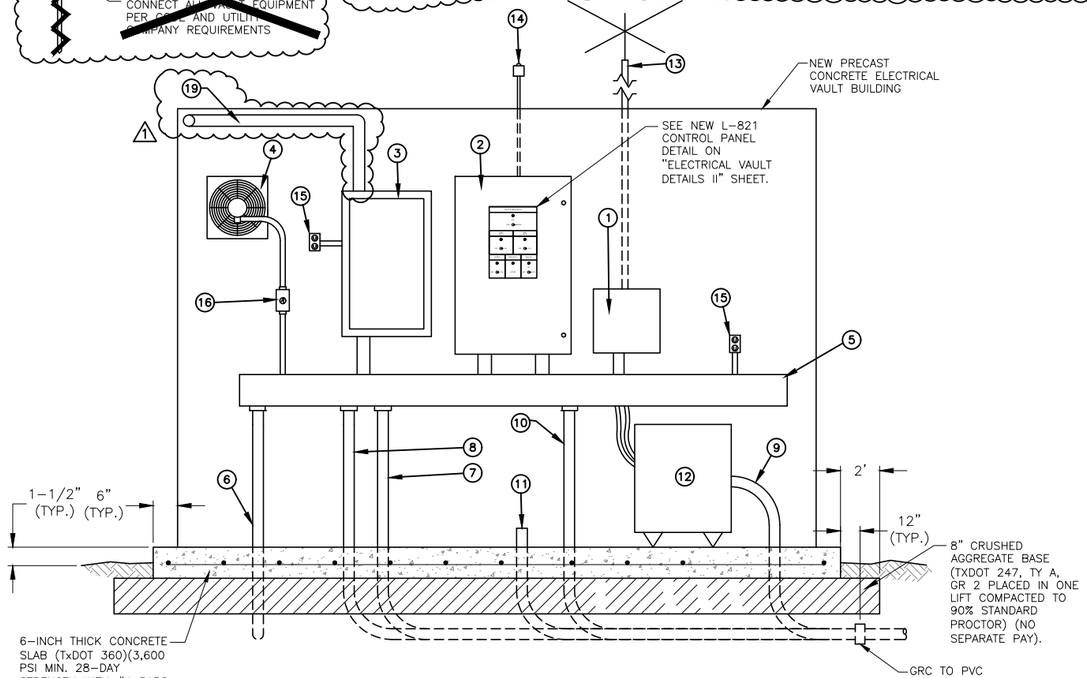


ISOMETRIC VIEW OF NEW ELECTRICAL VAULT

NTS

VAULT NOTES:

1. USE GALVANIZED RIGID STEEL CONDUIT (GRC) AND ELBOWS UNDER CONCRETE SLAB. USE GRC WHEREVER EXPOSED (ABOVE GROUND). ALL CONDUIT SHALL BE NEW MINIMUM SIZE 3/4–INCH, AND CONSIDERED SUBSIDIARY TO LUMP SUM L–109 PAY ITEM WITHIN THE LIMITS OF THE NEW PRECAST CONCRETE ELECTRICAL VAULT.
2. NEW PRECAST CONCRETE ELECTRICAL VAULT TO BE MINIMUM 10' x 12' x 8'–8" (EXTERIOR DIMENSION) STRUCTURE. BUILDING EXTERIOR TO HAVE FORM–LINE SIMULATED SPLIT BLOCK FINISH, WITH COLOR TO BE APPROVED BY COUNTY. BUILDING TO BE KEYED AND LOCKABLE. BUILDING SHALL MEET ALL LOCAL BUILDING CODES AND WIND LOADING REQUIREMENTS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER PRIOR TO ORDERING BUILDING.
3. BUILDING TO BE ATTACHED TO CONCRETE SLAB FOUNDATION USING 1/2" x 4–1/4" WEDGE STYLE CONCRETE ANCHORS @ 24" O.C. BUILDING TO INCLUDE: 1/4" x 4" NEOPRENE GASKET BETWEEN BUILDING BOTTOM AND CONCRETE SLAB, TWO 4', INDUSTRIAL LED FIXTURES DESIGNED TO PROVIDE 40–FOOT–CANDLE AVERAGE LIGHT LEVEL AND SUITABLE FOR OPERATION DOWN TO 0 DEGREES FAHRENHEIT, A THERMOSTATICALLY–CONTROLLED EXHAUST FAN SIZED PER THE MANUFACTURER AND INCLUDING AN INSECT SCREEN, AND A LOUVERED FRESH AIR INTAKE INCLUDING AN INSECT SCREEN. THE EXHAUST FAN SHALL BE PLACED TOWARD THE TOP OF THE BUILDING AND THE FRESH AIR INTAKE TOWARDS THE BOTTOM. THE EXHAUST AND INTAKE SHALL BE DIAGONALLY OPPOSITE EACH OTHER IN THE VAULT.
4. CONTRACTOR TO PROVIDE AND INSTALL A 6' SQUARE, 6" THICK REINFORCED CONCRETE SLAB CENTERED ON DOORWAY FOR EXTERIOR SWINGING VAULT DOORS.
5. VAULT LAYOUT IS TYPICAL. ACTUAL LAYOUT MAY VARY FROM THAT SHOWN TO MEET CODE AND MANUFACTURER RECOMMENDATIONS.
6. ALL EQUIPMENT AND INSTALLATION SHALL BE IN ACCORDANCE WITH NATIONAL AND LOCAL ELECTRICAL CODE.
7. ALL EQUIPMENT SHOWN TO BE INSTALLED BY THE CONTRACTOR.
8. ALL WORK SHOWN SHALL BE PAID FOR UNDER THE LUMP SUM L–109 PAY ITEMS, "FURNISH AND INSTALL NEW PRECAST CONCRETE ELECTRICAL VAULT ON CONCRETE FOUNDATION; FURNISH AND INSTALL NEW ELECTRICAL EQUIPMENT AND PLACE INTO SERVICE ALL NEW AIRFIELD LIGHTING SYSTEMS" AND "PROVIDE AND INSTALL NEW 2.5kW 3–STEP L–828 CCR–FERRORESONANT REGULATOR FOR MIRL CIRCUIT".
9. COLOR CODE ALL WIRING BY THE USE OF COLORED WIRE INSULATION AND/OR COLORED TAPE. WHERE TAPE IS USED, THE WIRE INSULATION MUST BE BLACK. BLACK AND RED MUST BE USED FOR SINGLE–PHASE, THREE–WIRE SYSTEMS. NEUTRAL CONDUCTORS MUST BE IDENTIFIED BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG THEIR ENTIRE LENGTH (ALL WIRE SIZES) OR BY THE USE OF WHITE TAPE AT TERMINATIONS AND INSIDE ACCESSIBLE WIREWAYS (ONLY ALLOWED FOR WIRES LARGER THEN NO. 6 AWG). ALL ELECTRICAL SERVICE WIRING SHALL BE COPPER.
10. NEATLY LACE WIRING IN AUTOMATIC TRANSFER SWITCH, DISTRIBUTION PANELS, WIREWAYS, SWITCHES, AND JUNCTION BOXES.
11. SPLICES AND JUNCTION POINTS ARE PERMITTED ONLY IN JUNCTION BOXES, ENCLOSURES EQUIPPED WITH REMOVABLE COVERS, AND AT EASILY ACCESSIBLE LOCATIONS.
12. UNLESS OTHERWISE SHOWN, ALL EXPOSED CONDUITS MUST BE RUN PARALLEL TO, OR AT RIGHT ANGLES WITH, THE LINES OF THE STRUCTURE.
13. ALL STEEL CONDUITS, FITTINGS, NUTS, BOLTS, ETC., MUST BE GALVANIZED.
14. BOTH ENDS OF ALL CONTROL CONDUCTORS MUST BE IDENTIFIED AS TO THE CIRCUIT, TERMINAL, BLOCK, AND TERMINAL NUMBER. ONLY STICK–ON LABELS ARE ALLOWED.
15. A SEPARATE AND CONTINUOUS NEUTRAL CONDUCTOR MUST BE INSTALLED AND CONNECTED FOR EACH BREAKER CIRCUIT IN THE POWER PANEL FROM THE NEUTRAL BAR TO EACH POWER/CONTROL CIRCUIT.
16. ONE FIRE EXTINGUISHER SHALL BE PROVIDED AND MOUNTED ON THE WALL NEAREST THE DOORS (NO SEPARATE PAY).
17. CONTRACTOR SHALL INSTALL UTILITY–FURNISHED METER SOCKET ON NEW VAULT IN ACCORDANCE WITH ELECTRIC UTILITY COMPANY REQUIREMENTS (NO SEPARATE PAY).
18. LOCATIONS OF CONDUITS ENTERING THE VAULT ARE SHOWN ON "77 – ELECTRICAL PLAN – III".
19. ALL LETTERING SHALL BE ON ENGRAVED METAL OR PHENOLIC MATERIAL. PLASTIC TAPE WILL NOT BE ACCEPTABLE. COLOR OF LETTERING SHALL CONTRAST WITH COLOR OF PANEL FACE.
20. CONTRACTOR SHALL COORDINATE WITH ELECTRIC UTILITY COMPANY FOR PERMITTING, INSTALLATION OF NEW OVERHEAD ELECTRIC UTILITY SERVICE, AND COST ASSOCIATED WITH TEH NEW SERVICE (NO SEPARATE PAY).
21. CONTRACTOR SHALL CONFIRM AVAILABLE FAULT CURRENT WITH ELECTRIC UTILITY COMPANY, AND PROVIDE MAIN DISCONNECT, AUTOMATIC TRANSFER SWITCH, AND LIGHTING PANEL WITH APPROPRIATE FAULT CURRENT INTERRUPTING RATINGS.
22. ALL RIGID CONDUIT SHALL BE TERMINATED AT CCRS WITH A SECTION (10–INCH MINIMUM) OF FLEXIBLE CONDUIT.
23. FIRE–RATED DOORS SHALL BE HOLLOW FULL FLUSH, 1¾–INCH–THICK, 16 GAUGE STEEL SHEET IN ACCORDANCE WITH ANSI/SDI–100 WITH HONEYCOMB OR STEEL STIFFENED RIB CORE FOR FULL THICKNESS OF DOOR. FIRE–RATED DOORS AND FRAME CONSTRUCTION SHALL CONFORM TO UL 10B. FIRE DOORS SHALL CARRY UNDERWRITERS LABEL ON THE DOOR. PROVIDE A DOUBLE DOOR WITH EACH DOOR LEAF 3'–0" WIDE BY 7'–0" HIGH. STEEL DOOR FRAME SHALL BE MADE OF 14 GAUGE STEEL IN ACCORDANCE WITH ANSI/SDI–100. FIRE RATED FRAME SHALL CARRY UNDERWRITERS LABEL ON THE FRAME. FRAMES SHALL BE 2 INCHES BY 5¾ INCHES. DOOR HARDWARE SHALL BE THE FOLLOWING, OR EQUAL: SARGENT 8813 RIM EXIT DEVICE PANIC BAR; DOOR CLOSER 1460 BF FOR ACTIVE LEAF; 8–INCH IVES 1630 SURFACE BOLTS TOP AND BOTTOM AND OVERHEAD DOOR HOLDER GJ 81H FOR INACTIVE LEAF.
24. CONDUCTORS (NOT SHOWN) FROM OUTDOOR MAIN BREAKER DISCONNECT SHALL BE CONNECTED TO INDOOR AUTOMATIC TRANSFER SWITCH NORMAL SOURCE TERMINALS.
25. PROVIDE 2" AND 3/4" CONDUITS FROM AUTOMATIC TRANSFER SWITCH THROUGH WALL AND CAPPED OUTSIDE 24" AFF FOR FUTURE GENERATOR INSTALLATION. APPROXIMATE STUB OUT LOCATIONS AS SHOWN.



VAULT SECTION VIEW–INTERIOR BACKWALL

NTS

ELECTRICAL VAULT LEGEND	
1	NEW L–854 RADIO CONTROL
2	NEW ENCLOSED L–821 CONTROL PANEL
3	NEW 120/240V 1ø 3 WIRE MIN. 200A MB 30 CKT PANEL WITH THERMAL–MAGNETIC BOLT–ON BREAKERS
4	NEW EXHAUST FAN (W/ INSECT SCREEN)
5	NEW MIN. 6" x 6" LOW VOLTAGE (600V OR LESS) WIRING GUTTER
6	2" COATED GRC WITH 2–#8 TYPE C 600V POWER CABLE AND 1–#8 XHHW 600V GROUND CABLE TO BEACON
7	2" COATED GRC WITH 2–#8 TYPE C 600V POWER CABLES AND 1–#8 XHHW 600V GROUND CABLE TO RW 17 PAPI
8	2" COATED GRC WITH 2–#8 TYPE C 600V POWER CABLES AND 1–#8 XHHW 600V GROUND CABLE TO RW 35 PAPI
9	2" COATED GRC WITH 2–#8 TYPE C 5KV POWER CABLES TO RW 17–35 MIRL CIRCUIT
10	SPARE 2" COATED GRC CONDUIT (STUBBED OUT AND CAPPED 2–FEET OUTSIDE BASE)
11	2" COATED GRC SPARE CONDUIT (CAPPED)
12	NEW 3–STEP 2.5KW CLASS 1, STYLE 1, 240V, 60 HZ, L–828 FERRORESONANT CONSTANT CURRENT REGULATOR WITH INTEGRAL SERIES CIRCUIT CUT–OUT TO ISOLATE THE LIGHTING CIRCUIT FROM THE CCR FOR MAINTENANCE.
13	NEW RADIO–CONTROL ANTENNA
14	NEW FAA APPROVED PHOTOCELL FOR AVIATION SERVICE WITH BYPASS SWITCH
15	NEW ENCLOSED GFCI DUPLEX RECEPTACLE
16	NEW EXHAUST FAN THERMOSTAT
17	NEW LOUVER (INTAKE, W/ INSECT SCREEN)
18	NEW 120/240V 1ø 3–WIRE MIN. 200A AUTOMATIC TRANSFER SWITCH
19	2" GRC WITH 2~3/0 AND 3/0 NEUTRAL THWN–2 600V POWER CABLES AND 1~#6 THWN–2 600V GROUND FROM ATS LOAD TERMINALS TO 120/240V PANEL.

STATE OF TEXAS
RICHARD GERARD THIMM
123925
LICENSED
PROFESSIONAL ENGINEER
Exp 12/31/26
4/22/26

NO.	REVISIONS	DATE:
1.	ADDENDUM NO. 1	4.22.26

VAULT DETAILS - I

CARTHAGE, TEXAS
PANOLA COUNTY AIRPORT - SHARPE FIELD
2026 AIRPORT ELECTRICAL AND PAVEMENT IMPROVEMENTS

JOB NO. 1174.001
PROJECT MGR. JRE
TBPE No. F-8405
STRAND ASSOCIATES®
SHEET 85

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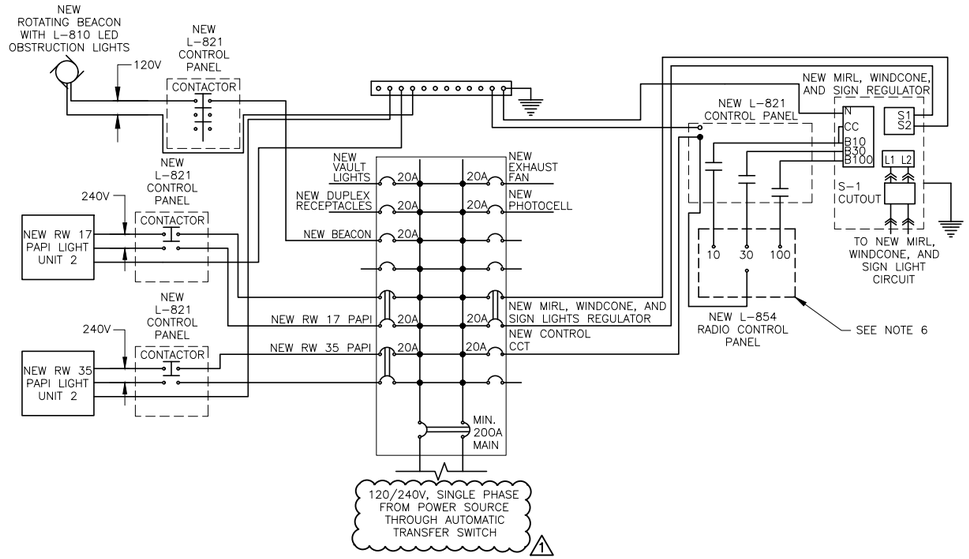
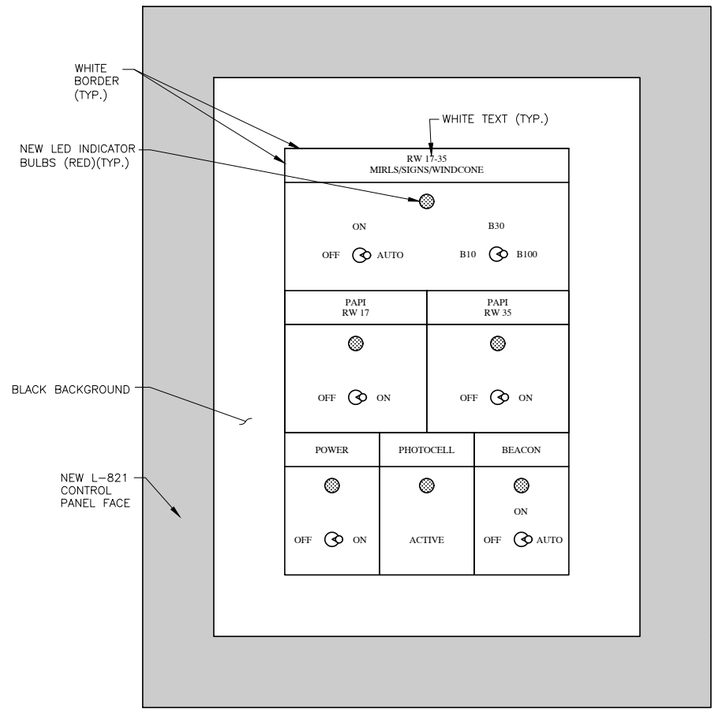
WIRING DIAGRAM NOTES:

1. CONTRACTOR SHALL SUBMIT WIRING DIAGRAM TO THE ENGINEER PRIOR TO BEGINNING ELECTRICAL WORK FOR APPROVAL.
2. WIRING DIAGRAM IS TYPICAL. ACTUAL WIRING MAY VARY FROM THAT SHOWN. SEE MANUFACTURER'S INSTRUCTIONS.
3. PHOTOCELL WIRING NOT SHOWN FOR CLARITY OF DRAWING. PHOTOCELL SHALL CONTROL MIRL, WINDCONE, SIGN, AND BEACON CIRCUITS. PHOTOCELL SHALL FACE TRUE NORTH. RW LIGHTS SHALL ACTIVATE TO LOWEST INTENSITY WHEN THE PHOTOCELL IS ENERGIZED.
4. L–821 CONTROL PANEL WIRING NOT SHOWN FOR CLARITY OF DRAWING. CONTROL PANEL SHALL CONTROL: MIRL, WINDCONE, SIGNS, BEACON, AND BOTH PAPI SYSTEMS.
5. CONNECT BEACON, RUNWAY 17 PAPI, RUNWAY 35 PAPI, AND MIRLS, WINDCONE, AND SIGNS TO SEPARATE BUSBARS.
6. L–854 RADIO CONTROL SHALL CONTROL THE MIRL, WINDCONE, AND SIGN SYSTEM. MIRL, WINDCONE, AND SIGN SYSTEM SHALL OPERATE WITH THE RADIO CONTROL STANDARD SETTINGS.
7. THE ELECTRICAL CONTROLS SHALL BE SET SO THAT THE RUNWAY LIGHTS SWITCH TO 10–PERCENT INTENSITY AFTER 15 MINUTES OF NON–USE DURING LOW LIGHT CONDITIONS AND SWITCH OFF AFTER 15 MINUTES OF NON–USE DURING DAYLIGHT CONDITIONS.



TYPICAL WIRING DIAGRAM
NTS



NOTES: SEE SHEET 85 – VAULT DETAILS – I FOR ADDITIONAL NOTES.

VAULT SECTION VIEW– EXTERIOR NORTH WALL
NTS

NEW L–821 CONTROL PANEL DETAIL
NTS

STATE OF TEXAS
RICHARD GERARD THIMM
123925
LICENSED
PROFESSIONAL ENGINEER
4/22/26

NO.	REVISIONS	DATE:
1.	ADDENDUM NO. 1	4.22.26

VAULT DETAILS - II

CARTHAGE, TEXAS
PANOLA COUNTY AIRPORT - SHARPE FIELD
2026 AIRPORT ELECTRICAL AND PAVEMENT IMPROVEMENTS

JOB NO. 1174.001
PROJECT MGR. JRE
TBPE No. F-8405
STRAND ASSOCIATES®
SHEET 86

File: S:\BRC\1100---1199\1174\001\Drawings\CAD\Sheets\PAPI DETAILS.dwg Time: Apr 22, 2026 - 1:32pm