

ADDENDUM NO. 02	TO: All Planholders
	FROM: Parkhill
	PROJECT NAME: 2501SHRMN Sherman Municipal Airport (SWI) Airfield Pavement and Electrical Improvements
	PROJECT NO.: 43676.24
	DATE: February 10, 2026

Attention all Prospective Proposers/Planholders: The following are modifications to referenced Drawings and Project Manual. This Addendum becomes a part of Contract Documents and modifies original Contract Documents dated November 3, 2025, as noted herein:

This Addendum consists of Summary, Bid Form (under separate cover), Specification, and Drawings.

I. CHANGES TO TxDOT BID FORM:

1. Replace in its entirety to include:
 - a. Bid Item 18 – Changed counterpoise size from No. 2AWG to No. 6AWG.
 - b. Bid Item 35 – Increased quantity from 1 to 2.

II. CHANGES TO TECHNICAL SPECIFICATIONS:

1. Item L-106 Underground Power Cable for Airports Mod Sheet.
 - A. Reissue, noting the change in counterpoise size from No.2AWG to No. 6AWG.
2. Item L-108 Underground Power Cable for Airports.
 - A. Reissue, noting the change in counterpoise size from No.2AWG to No. 6AWG.

III. CHANGES TO DRAWINGS:

1. Replace the following in their entirety with the attached:
 - a. Sheet G-002
 - b. Sheet E-109
 - c. Sheet E-110
 - d. Sheet E-501
 - e. Sheet E-502
 - f. Sheet E-503
 - g. Sheet E-504
 - h. Sheet E-505

END OF ADDENDUM NO. 02



Respectfully submitted,

PARKHILL

By: 

***Bidder shall acknowledge receipt of this addendum below and on Bid Proposal.
Attach entire addendum to Bid Proposal submission.***

ACKNOWLEDGED:

By: _____

Modifications to:

ITEM L-108 UNDERGROUND POWER CABLE FOR AIRPORTS

Item L-108 Underground Power Cable for Airports of Project Specifications shall be modified as follows:

- A. **108-2.1.e.**
 - 1. Select “electronically submitted in pdf format.”
 - 2. Delete selection “neatly bound in a properly sized 3-ring binder, tabbed by Specification Section.”
- B. **108-2.1.f.**
 - 1. Select “twelve (12) months.”
- C. **108-2.2 Cable.**
 - 1. Select “Type C”
 - 2. Delete selection “Type B”
 - 3. Select “cross-linked polyethylene insulation”
 - 4. Delete selection “Ethylene propylene insulation”
 - 5. Select “Type C”
 - 6. Delete selection “Type B”
 - 7. Select “cross-linked polyethylene insulation”
 - 8. Delete selection “Ethylene propylene insulation”
- D. **108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods).**
 - 1. Select “2”
 - 2. Delete selections “6” and “4”
 - 3. Select “6.”
 - 4. Delete selections “2” and “4”
 - 5. Select “tinned copper wire per ASTM B33”
 - 6. Delete selection “bare copper wire”
 - 7. Select “copper-clad steel.”
 - 8. Delete selections “solid stainless steel,” “copper,” the word “or,” and “sectional copper-clad steel.”
 - 9. Select “10 feet” and “5/8-inch,” respectively.
 - 10. Delete selections “8 feet” and “3/4-inch,” respectively.
- E. **108-2.6 Concrete.** Select “Concrete shall be proportioned, placed, and cured per Item P-610, concrete for Miscellaneous Structures.”
- F. **108-2.11 Existing circuits.** Delete selection [].
- G. **108-3.3.b. Backfilling.**
 - 1. Select “to a minimum of 100 percent of ASTM D1557.”
 - 2. Delete selection “backfill with controlled low strength material (CLSM) in accordance with P-153.”
- H. **108-3.3.c. Restoration.**
 - 1. Select “seeding”
 - 2. Delete remaining selections.
 - 3. Select “to a minimum of 100 percent of ASTM D1557.”
 - 4. Delete selection “backfill with controlled low strength material (CLSM) in accordance with P-153.”
- I. **108-3.6. Bare counterpoise wire installation for lightning protection and grounding.** Select “#6 AWG” and change “6” to “2”



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- J. **108-3.6.b. Isolation.**
1. Delete three paragraphs in their entirety.
 2. Add “Not used.”
- K. **108-3.6.c. Common Installation requirements.** Select both paragraphs.
- L. **108-3.10.e.** Add “25” to complete “...segments is not less than [] megohms.”
- M. **108-3.10.i.** Add “25” to complete “...each ground rod does not exceed [] ohms.”
- N. **108-4.1.**
1. Delete first paragraph selection.
 2. Select second paragraph.
- O. **108-4.2**
1. Select “shall”
 2. Delete selection “shall not”
- P. **108-5.1** Payment will be made under:
1. Modify pay Item L-108-5.1 as “Item L-108-5.1.1 Trenching for PVC Conduit, 24-Inch Minimum Depth - per linear foot.”
 2. Modify next pay item to “Item L-108-5.1.2 No. 8 AWG, 600V, L-824, Type C Cable Installed in Duct Bank or Conduit – per linear foot.”
 3. Modify next pay item to “Item L-108-5.1.3 No. 6 AWG, L-824, Type C, Solid, Bare Counterpoise Wire, Installed Above the Duct Bank or Conduit, Including Connections/Terminations - per linear foot.”
 4. Delete pay item L-108-5.4 in its entirety.

END OF L-108 MODIFICATION

Item L-108 Underground Power Cable for Airports

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing power cables that are direct buried and furnishing and/or installing power cables within conduit or duct banks per these Specifications at the locations shown on the Plans. It includes excavation and backfill of trench for direct-buried cables only. Also included are the installation of counterpoise wires, ground wires, ground rods and connections, cable splicing, cable marking, cable testing, and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the Engineer. This item shall not include the installation of duct banks or conduit, trenching and backfilling for duct banks or conduit, or furnishing or installation of cable for FAA owned/operated facilities.



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EQUIPMENT AND MATERIALS

108-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be approved under the Airport Lighting Equipment Certification Program per AC 150/5345-53, current version.

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 ~~neatly bound in a properly sized 3-ring binder, tabbed by Specification Section.~~ ~~electronically submitted in pdf format.~~ 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 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. The Contractor shall maintain a minimum insulation resistance in accordance with paragraph 108-3.10e with isolation transformers connected in new circuits and new segments of existing circuits through the end of the contract warranty period when tested in accordance with AC 150/5340-26, *Maintenance Airport Visual Aid Facilities*, paragraph 5.1.3.1, Insulation Resistance Test.

108-2.2 Cable. Underground cable for airfield lighting facilities (runway and taxiway lights and signs) shall conform to the requirements of AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits latest edition. Conductors for use on 6.6 ampere primary airfield lighting series circuits shall be single conductor, 7 strand, #8 American wire gauge (AWG), L-824 ~~Type B~~ Type C, 5,000 volts, non-shielded, with ~~ethylene propylene insulation~~ cross-linked polyethylene insulation. Conductors for use on 20 ampere primary airfield lighting series circuits shall be single conductor, 7 strand, #6 AWG, L-824 ~~Type B~~ Type C, 5,000 volts, non-shielded, with ~~ethylene propylene insulation~~ cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations.

All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Commercial Item Description A-A-59544A and shall be type THWN-2, 75°C for installation in conduit and RHW-2, 75 degrees C for direct burial installations. Conductors for parallel (voltage) circuits shall be type and size and installed in accordance with NFPA-70, National Electrical Code.

Unless noted otherwise, all 600-volt and less non-airfield lighting conductor sizes are based on a 75 degrees C, THWN-2, 600-volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of THWN-2, 600-volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.

Conductor sizes may have been adjusted due to voltage drop or other engineering considerations. Equipment provided by the Contractor shall be capable of accepting the quantity and sizes of conductors shown in the Contract Documents. All conductors, pigtails, cable step-down adapters, cable step-up adapters, terminal blocks and splicing materials necessary to complete the cable termination/splice shall be considered incidental to the respective pay items provided.

Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.

108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods). Wire for counterpoise or ground installations for airfield lighting systems shall be No. ~~6~~ ~~4~~ ~~2~~ AWG bare solid copper wire for counterpoise and/or No. ~~6~~ ~~4~~ ~~2~~ AWG insulated stranded for grounding bond wire per ASTM B3 and ASTM B8, and shall be ~~bare copper wire~~ tinned copper wire per ASTM B33. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

Ground rods shall be ~~solid stainless steel~~ ~~copper~~ or ~~copper-clad steel~~ ~~sectional copper-clad steel~~. The ground rods shall be of the length and diameter specified on the plans, but in no case be less than ~~8 feet~~ 10 feet long and ~~5/8-inch~~ ~~3/4 inch~~ in diameter.

108-2.4 Cable connections. In-line connections or splices of underground primary cables shall be of the type called for on the Plans and shall be one of the types listed below. No separate payment will be made for cable connections.

a. The cast splice. A cast splice, employing a plastic mold and using epoxy resin equivalent to that manufactured by 3M™ Company, "Scotchcast" Kit No. 82-B, or an approved equivalent, used for potting the splice is acceptable.

b. The field-attached plug-in splice. Field-attached plug-in splices shall be installed as shown on the Plans. Contractor shall determine the outside diameter of the cable to be spliced and furnish appropriately sized connector kits and/or adapters. Tape or heat shrink tubing with integral sealant shall be in accordance with the manufacturer's requirements. Primary Connector Kits manufactured by Amerace, "Super Kit," Integro "Complete Kit," or approved equal is acceptable.

c. The factory-molded plug-in splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

d. The taped or heat-shrink splice. Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

108-2.5 Splicer qualifications. Every airfield lighting cable splicer shall be qualified in making airport cable splices and terminations on cables rated at or above 5,000 volts AC. Contractor shall submit to the Engineer proof of the qualifications of each proposed cable splicer for the airport cable type and voltage level to be worked on. Cable splicing/terminating personnel shall have a minimum of 3 years continuous experience in terminating/splicing medium voltage cable.

108-2.6 Concrete. †—Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.—†

108-2.7 Flowable backfill. Flowable material used to backfill trenches for power cable trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

108-2.8 Cable identification tags. Cable identification tags shall be made from a non-corrosive material with the circuit identification stamped or etched onto the tag. The tags shall be of the type as detailed on the plans.

108-2.9 Tape. Electrical tapes shall be Scotch™ Electrical Tapes –Scotch™ 88 (1-1/2-inch-wide) and Scotch™ 130C® linerless rubber splicing tape (2-inch-wide), as manufactured by the Minnesota Mining and Manufacturing Company (3M™), or an approved equivalent.

108-2.10 Electrical coating. Electrical coating shall be Scotchkote™ as manufactured by 3M™, or an approved equivalent.

108-2.11 Existing circuits. Whenever the scope of work requires connection to an existing circuit, the existing circuit's insulation resistance shall be tested, in the presence of the Engineer. The test shall be performed per this item and prior to any activity that will affect the respective circuit. Contractor shall record the results on forms acceptable to the Engineer. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the presence of the Engineer. The Contractor shall record the results on forms acceptable to the Project Engineer. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the existing circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual. 

108-2.12 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) Red (electrical power lines, cables, conduit and lighting cable) with continuous legend tape shall be polyethylene film with a metalized foil core and shall be 3 to 6 inches wide. Detectable tape is incidental to the respective bid item. Detectable warning tape for communication cables shall be orange. Detectable warning tape color code shall comply with the APWA Uniform Color Code.

CONSTRUCTION METHODS

108-3.1 General. The Contractor shall install the specified cable at the approximate locations indicated on the plans. Unless otherwise shown on the Plans, all cable required to cross under pavements expected to carry aircraft loads shall be installed in concrete encased duct banks. Cable shall be run without splices, from fixture to fixture.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual isolation transformers. Contractor shall be responsible for providing cable in continuous lengths for home runs or other long cable runs without connections unless otherwise authorized in writing by the Engineer or shown on the Plans.

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations shown on the plans. Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed and on both sides of slack loops where a future connector would be installed.

Provide not less than 3 feet of cable slack on each side of all connections, isolation transformers, light units, and at points where cable is connected to field equipment. Where provisions must be made for testing or for future above-grade connections, provide enough slack to allow the cable to be extended at least 1 foot vertically above the top of the access structure. This requirement also applies where primary cable passes through empty light bases, junction boxes, and access structures to allow for future connections, or as designated by the Engineer.

Primary airfield lighting cables installed shall have cable circuit identification markers attached on both sides of each L-823 connector and on each airport lighting cable entering or leaving cable access points, such as manholes, hand holes, pull boxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than 1/4-inch in size. The cable circuit identification shall match the circuits noted on the construction plans.

108-3.2 Installation in duct banks or conduits. This item includes the installation of the cable in duct banks or conduit per the following paragraphs. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be per the latest version of the National Electric Code, or the code of the local agency or authority having jurisdiction.

The Contractor shall make no connections or splices of any kind in cables installed in conduits or duct banks.

Unless otherwise designated in the plans, where ducts are in tiers, use the lowest ducts to receive the cable first, with spare ducts left in the upper levels. Check duct routes prior to construction to obtain assurance that the shortest routes are selected and that any potential interference is avoided.

Duct banks or conduits shall be installed as a separate item per Item L-110, Airport Underground Electrical Duct Banks and Conduit. Contractor shall run a mandrel through duct banks or conduit prior to installation of cable to ensure that the duct bank or conduit is open, continuous and clear of debris. The mandrel size shall be compatible with the conduit size. Contractor shall swab out all conduits/ducts and clean light bases, manholes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed, the light bases and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, light bases, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned at Contractor's expense. Contractor shall verify existing ducts proposed for use in this project as clear and open. Contractor shall notify the Engineer of any blockage in the existing ducts.

Cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing before pulling into the conduit and it shall be left sealed until connections are made. Where more than one cable is to be installed in a conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

Contractor shall submit the recommended pulling tension values to the Engineer prior to any cable installation. If required by the Engineer, pulling tension values for cable pulls shall be monitored by a dynamometer in the presence of the Engineer. Cable pull tensions shall be recorded by the Contractor and reviewed by the Engineer. Cables exceeding the maximum allowable pulling tension values shall be removed and replaced by the Contractor at Contractor's expense.

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the Engineer, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

Cable shall not be dragged across base can or manhole edges, pavement or earth. When cable must be coiled, lay cable out on a canvas tarp or use other appropriate means to prevent abrasion to the cable jacket.

108-3.3 Installation of direct-buried cable in trenches. Unless otherwise specified, the Contractor shall not use a cable plow for installing the cable. Cable shall be unreeled uniformly in place alongside or in the trench and shall be carefully placed along the bottom of the trench. The cable shall not be unreeled and pulled into the trench from one end. Slack cable sufficient to provide strain relief shall be placed in the trench in a series of S curves. Sharp bends or kinks in the cable shall not be permitted.

Where cables must cross over each other, a minimum of 3 inches vertical displacement shall be provided with the topmost cable depth at or below the minimum required depth below finished grade.

a. Trenching. Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored. Trenches for cables may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of surface is disturbed. Graders shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 18 inches below finished grade per NEC Table 300.5, except as follows:

- When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches unless otherwise specified.
- Minimum cable depth when crossing under a railroad track, shall be 42 inches unless otherwise specified.

Contractor shall excavate all cable trenches to a width not less than 6 inches. Unless otherwise specified on the Plans, all cables in the same location and running in the same general direction shall be installed in the same trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches below the required cable depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch sieve. Flowable backfill material may alternatively be used.

Duct bank or conduit markers temporarily removed for trench excavations shall be replaced as required.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

(1) Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred.

(2) Trenching, etc., in cable areas shall then proceed, with approval of the Engineer, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair or replacement.

b. Backfilling. After the cable has been installed, the trench shall be backfilled. The first layer of backfill in the trench shall encompass all cables; be 3 inches deep, loose measurement; and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch sieve. This layer shall not be compacted. The second layer shall be 5 inches deep, loose measurement, and shall contain no particles that would be retained on a one inch sieve. The remaining third and subsequent layers of backfill shall not exceed 8 inches of loose measurement and be excavated or imported material and shall not contain stone or aggregate larger than 4 inches maximum diameter.

The second and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent material. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be ~~+~~ to a minimum of 100 percent of ASTM D1557 ~~+~~ ~~backfill with controlled low strength material (CLSM) in accordance with P-153~~ ~~+~~.

Trenches shall not contain pools of water during backfilling operations. The trench shall be completely backfilled and tamped level with the adjacent surface, except that when turf is to be established over the trench, the backfilling shall be stopped at an appropriate depth consistent with the type of turfing operation to be accommodated. A proper allowance for settlement shall also be provided. Any excess excavated material shall be removed and disposed of per the plans and specifications.

Underground electrical warning (caution) tape shall be installed in the trench above all direct-buried cable. Contractor shall submit a sample of the proposed warning tape for acceptance by the Engineer. If not shown on the Plans, the warning tape shall be located 6 inches above the direct-buried cable or the counterpoise wire if present. A 3- to 6-inch-wide polyethylene film detectable tape, with a metalized foil core, shall be installed above all direct buried cable or counterpoise. The tape shall be of the color and have a continuous legend as indicated on the plans. The tape shall be installed 8 inches minimum below finished grade.

c. Restoration. Following restoration of all trenching near airport movement surfaces, the Contractor shall visually inspect the area for foreign object debris (FOD) and remove any that is found. Where soil and sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by work shall be restored to its original condition. The restoration shall include the ~~sodding~~ ~~topsoiling~~ ~~fertilizing~~ ~~liming~~ ~~seeding~~ ~~sprigging~~ ~~mulching~~ as shown on the Plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. When trenching is through paved areas, restoration shall be equal to existing conditions. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be ~~to a minimum of 100 percent of ASTM D1557~~ ~~backfill with controlled low strength material (CLSM) in accordance with P-153~~. Restoration shall be considered incidental to the pay item of which it is a component part.

108-3.4 Cable markers for direct-buried cable. The location of direct buried circuits shall be marked by a concrete slab marker, 2 feet square and 4 to 6 inches thick, extending approximately one inch above the surface. Each cable run from a line of lights and signs to the equipment vault shall be marked at approximately every 200 feet along the cable run, with an additional marker at each change of direction of cable run. All other direct-buried cable shall be marked in the same manner. Cable markers shall be installed directly above the cable. The Contractor shall impress the word "CABLE" and directional arrows on each cable marking slab. The letters shall be approximately 4 inches high and 3 inches wide, with width of stroke 1/2-inch and 1/4-inch-deep. Stencils shall be used for cable marker lettering; no hand lettering shall be permitted.

At the location of each underground cable connection/splice, except at lighting units, or isolation transformers, a concrete marker slab shall be installed to mark the location of the connection/splice. The Contractor shall impress the word "SPLICE" on each slab. The Contractor also shall impress additional circuit identification symbols on each slab as directed by the Engineer. All cable markers and splice markers shall be painted international orange. Paint shall be specifically manufactured for uncured exterior concrete. After placement, all cable or splice markers shall be given one coat of high-visibility aviation orange paint as approved by the Engineer. Furnishing and installation of cable markers is incidental to the respective cable pay item.

108-3.5 Splicing. Connections of the type shown on the plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

a. Cast splices. These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured per the manufacturer's instructions and to the satisfaction of the Engineer.

b. Field-attached plug-in splices. These shall be assembled per the manufacturer's instructions. These splices shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) wrapped with at least one layer of rubber or synthetic rubber tape and 1 layer of plastic tape, 1/2 lapped, extending at least 1-1/2 inches on each side of the joint (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches on each side of the joint or (3) On connector kits equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

c. Factory-molded plug-in splices. These shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) Wrapped with at least 1 layer of rubber or synthetic rubber tape and one layer of plastic tape, 1/2 lapped, extending at least 1-1/2 inches on each side of the joint. (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches on each side of the joint. or (3) On connector kits so equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

d. Taped or heat-shrink splices. A taped splice shall be made in the following manner:

Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4-inch of bare conductor on each side of the connector. Prior to splicing, the 2 ends of the cable insulation shall be penciled using a tool designed specifically for this purpose and for cable size and type. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over which the tape will be applied (plus 3 inches on each end) is clean. After scraping, wipe the entire area with a clean lint-free cloth. Do not use solvents.

Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape, stretching it just short of its breaking point. The manufacturer's recommendation for stretching tape during splicing shall be followed. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately one inch over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering or splice boxes are required.

Heat shrinkable tubing shall be installed following manufacturer's instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminants prior to application.

e. Assembly. Surfaces of equipment or conductors being terminated or connected shall be prepared in accordance with industry standard practice and manufacturer's recommendations. All surfaces to be connected shall be thoroughly cleaned to remove all dirt, grease, oxides, nonconductive films, or other foreign material. Paints and other nonconductive coatings shall be removed to expose base metal. Clean all surfaces at least 1/4-inch beyond all sides of the larger bonded area on all mating surfaces. Use a joint compound suitable for the materials used in the connection. Repair painted/coated surface to original condition after completing the connection.

108-3.6 Bare counterpoise wire installation for lightning protection and grounding. If shown on the Plans or included in the job Specifications, bare solid ~~†#6-2 AWG†~~ copper counterpoise wire shall be installed for lightning protection of the underground cables. The Engineer shall select 1 of 2 methods of lightning protection for the airfield lighting circuit based upon sound engineering practice and lightning strike density.

a. Equipotential. – may be used by the Engineer for areas that have high rates of lightning strikes. The counterpoise size is determined by the Engineer. The equipotential method is applicable to all airfield lighting systems; i.e. runway, taxiway, apron – touchdown zone, centerline, edge, threshold and approach lighting systems. The equipotential method is also successfully applied to provide lightning protection for power, signal and communication systems. The light bases, counterpoise, etc – all components - are bonded together and bonded to the vault power system ground loop/electrode.

Counterpoise wire shall be installed in the same trench for the entire length of buried cable, conduits and duct banks that are installed to contain airfield cables. The counterpoise is centered over the cable/conduit/duct to be protected.

The counterpoise conductor shall be installed no less than 8 inches minimum or 12 inches maximum above the raceway or cable to be protected, except as permitted below:

(1) The minimum counterpoise conductor height above the raceway or cable to be protected shall be permitted to be adjusted subject to coordination with the airfield lighting and pavement designs.

(2) The counterpoise conductor height above the protected raceway(s) or cable(s) shall be calculated to ensure that the raceway or cable is within a 45-degree area of protection, (45 degrees on each side of vertical creating a 90-degree angle).

The counterpoise conductor shall be bonded to each metallic light base, mounting stake, and metallic airfield lighting component.

All metallic airfield lighting components in the field circuit on the output side of the constant current regulator (CCR) or other power source shall be bonded to the airfield lighting counterpoise system.

All components rise and fall at the same potential; with no potential difference, no damaging arcing and no damaging current flow.

See AC 150/5340-30, Design and Installation Details for Airport Visual Aids and NFPA 780, Standard for the Installation of Lightning Protection Systems, Chapter 11, for a detailed description of the Equipotential Method of lightning protection.

Reference FAA STD-019E, Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment, Part 4.1.1.7.

~~**b. Isolation** —used in areas where lightning strikes are not common. Counterpoise size is selected by the Project Engineer. The isolation method is an alternate method for use only with edge lights installed in turf and stabilized soils and raceways installed parallel to and adjacent to the edge of the pavement. NFPA 780 uses 15 feet to define “adjacent to.”~~

~~The counterpoise conductor shall be installed halfway between the pavement edge and the light base, mounting stake, raceway, or cable being protected.~~

~~The counterpoise conductor shall be installed 8 inches minimum below grade. The counterpoise is not connected to the light base or mounting stake. An additional grounding electrode is required at each light base or mounting stake. The grounding electrode is bonded to the light base or mounting stake with a 6 AWG solid copper conductor. Not used.~~

See AC 150/5340-30, Design and Installation Details for Airport Visual Aids and NFPA 780, Standard for the Installation of Lightning Protection Systems, Chapter 11, for a detailed description of the Isolation Method of lightning protection.

c. Common Installation requirements. †—When a metallic light base is used, the grounding electrode shall be bonded to the metallic light base or mounting stake with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.

When a nonmetallic light base is used, the grounding electrode shall be bonded to the metallic light fixture or metallic base plate with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor. †

Grounding electrodes may be rods, ground dissipation plates, radials, or other electrodes listed in the NFPA 70 (NEC) or NFPA 780.

Where raceway is installed by the directional bore, jack and bore, or other drilling method, the counterpoise conductor shall be permitted to be installed concurrently with the directional bore, jack and bore, or other drilling method raceway, external to the raceway or sleeve.

The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500 feet apart around the entire circuit. The counterpoise system shall be continuous and terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrode-grounding system. The connections shall be made as shown on the plans and in the specifications.

Where an existing airfield lighting system is being extended or modified, the new counterpoise conductors shall be interconnected to existing counterpoise conductors at each intersection of the new and existing airfield lighting counterpoise systems.

d. Parallel Voltage Systems. Provide grounding and bonding in accordance with NFPA 70, National Electrical Code.

108-3.7 Counterpoise installation above multiple conduits and duct banks. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete area of protection measured 45 degrees each side of vertical.

Where duct banks pass under pavement to be constructed in the Project, the counterpoise shall be placed above the duct bank. Reference details on the construction Plans.

108-3.8 Counterpoise installation at existing duct banks. When airfield lighting cables are indicated on the Plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.9 Exothermic bonding. Bonding of counterpoise wire shall be by the exothermic welding process or equivalent method accepted by the Engineer. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the Engineer, the welding kits, materials and procedures to be used for welded connections prior to any installations in the field. The installations shall comply with the manufacturer's recommendations and the following:

a. All slag shall be removed from welds.

b. Using an exothermic weld to bond the counterpoise to a lug on a galvanized light base is not recommended unless the base has been specially modified. Consult the manufacturer's installation directions for proper methods of bonding copper wire to the light base. See AC 150/5340-30 for galvanized light base exception.

c. If called for in the plans, all buried copper and weld material at weld connections shall be thoroughly coated with 6 mm of 3M™ Scotchkote™, or approved equivalent, or coated with coal tar Bitumastic® material to prevent surface exposure to corrosive soil or moisture.

108-3.10 Testing. The Contractor shall furnish all necessary equipment and appliances for testing the airport electrical systems and underground cable circuits before and after installation. Contractor shall perform all tests in the presence of the Engineer. Contractor shall demonstrate the electrical characteristics to the satisfaction of the Engineer. All costs for testing are incidental to the respective item being tested. For phased projects, the tests must be completed by phase. Contractor must maintain the test results throughout the entire project as well as during the warranty period that meet the following:

a. Earth resistance testing methods shall be submitted to the Engineer for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the Engineer. All such testing shall be at the sole expense of Contractor.

b. Should the counterpoise or ground grid conductors be damaged or suspected of being damaged by construction activities the Contractor shall test the conductors for continuity with a low resistance ohmmeter. The conductors shall be isolated such that no parallel path exists and tested for continuity. The Engineer shall approve of the test method selected. All such testing shall be at the sole expense of the Contractor.

After installation, the Contractor shall test and demonstrate to the satisfaction of the Engineer the following:

c. That all affected lighting power and control circuits (existing and new) are continuous and free from short circuits.

d. That all affected circuits (existing and new) are free from unspecified grounds.

e. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than ~~100~~25 megohms. Verify continuity of all series airfield lighting circuits prior to energization.

f. That the insulation resistance to ground of all new non-grounded conductors of new multiple circuits or circuit segments is not less than 100 megohms.

g. That all affected circuits (existing and new) are properly connected per applicable wiring diagrams.

h. That all affected circuits (existing and new) are operable. Tests shall be conducted that include operating each control not less than 10 times and the continuous operation of each lighting and power circuit for not less than 1/2 hour.

i. That the impedance to ground of each ground rod does not exceed ~~100~~25 ohms prior to establishing connections to other ground electrodes. The fall-of-potential ground impedance test shall be used, as described by American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81, to verify this requirement. As an alternate, clamp-on style ground impedance test meters may be used to satisfy the impedance testing requirement. Test equipment and its calibration sheets shall be submitted for review and approval by the Engineer prior to performing the testing.

Two copies of tabulated results of all cable tests performed shall be supplied by the Contractor to the Engineer. Where connecting new cable to existing cable, insulation resistance tests shall be performed on the new cable prior to connection to the existing circuit.

There are no approved "repair" procedures for items that have failed testing other than complete replacement.

METHOD OF MEASUREMENT

~~108-4.1 Trenching shall be measured by the linear feet of trench, including the excavation, backfill, and restoration, completed, measured as excavated, and accepted as satisfactory. When specified, separate measurement shall be made for trenches of various specified widths.~~

~~The cost of all excavation, backfill, dewatering and restoration regardless of the type of material encountered shall be included in the unit price bid for the work.~~

108-4.2 Cable or counterpoise wire installed in trench, duct bank or conduit shall be measured by the number of linear feet installed and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed

in trench, duct bank or conduit. The measurement for this item ~~shall~~ ~~shall not~~ include additional quantities required for slack.

108-4.3 No separate payment will be made for ground rods.

BASIS OF PAYMENT

108-5.1 Payment will be made at the contract unit price for trenching, cable and bare counterpoise wire installed in trench (direct-buried), or cable and equipment ground installed in duct bank or conduit, in place by the Contractor and accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, and incidentals, including ground rods and ground connectors and trench marking tape, necessary to complete this item.

Payment will be made under:

Item L-108-5.1.1	Trenching for direct buried cable, 18-inch minimum depth per linear foot Trenching for PVC Conduit, 24-Inch Minimum Depth – per linear foot.
Item L-108-5.1.2	— No. 8 AWG — No. 6 AWG , 5 kV 600V , L-824, Type C Type B Cable, Installed in Trench , Duct Bank or Conduit - per linear foot.
Item L-108-5.1.3	No. 6 4 2 AWG, L-824, Type C, Solid, Bare Copper Counterpoise Wire, Installed in Trench , Above the Duct Bank or Conduit , Including Connections/Terminations - per linear foot
Item L-108-5.4	No. 6 4 2 AWG, Bare Insulated, Stranded Equipment bonding Ground, Installed in Duct Bank or Conduit per linear foot

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 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description

A-A-59544A	Cable and Wire, Electrical (Power, Fixed Installation)
A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic

ASTM International (ASTM)

ASTM B3	Standard Specification for Soft or Annealed Copper Wire
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes
ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes

Mil Spec

MIL-PRF-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone Rubber, Electrical
MIL-I-24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive

National Fire Protection Association (NFPA)

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

American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
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Federal Aviation Administration Standard

FAA STD-019E	Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment
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END OF ITEM L-108

SUMMARY OF BID QUANTITIES

BID ITEM	SPEC No. & DESCRIPTION	QUANTITY	UNIT
1	C-102-5.1, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	LS	1
2	C-105-6.1, Mobilization (10%)	LS	1
3	Item P-101-4.1, Mill Existing Asphalt Surface, Millings to be Removed by Contractor	SY	3,930
4	Item P-101-4.2, Clean and Seal Existing Cracks Greater than 1/2 inch wide, Including Sealant, Prior to Placement of TxDOT Item 316	LF	61,400
5	Item P-101-4.3, Full Depth Asphalt Pavement Removal and Repair	SF	250
6	Item P-152-4.1, Unclassified Excavation	CY	330
7	Item P-152-4.2, PAPI Foundation Grading	SY	120
8	Item P-620-5.2, Taxiway and Runway Markings	SF	34,000
9	Item T-901-5.1, Seeding and Fertilizing	AC	2
10	Item T-905-5.1, Topsoil (Furnished from Off the Site)	CY	500
11	Item L-101-5.1.1, L-801A(L), Class 1, Voltage Driven Rotating Beacon with Obstruction Light	LS	1
12	Item L-103-5.1.1, 55-Foot Tip-Down Beacon Tower and Foundation	EA	1
13	Item L-107-5.2.1, Removal of Primary Wind Cone	EA	1
14	Item L-107-5.2.2, L-807, Style I-B, Size 2, Primary Wind Cone and Foundation	EA	1
15	Item L-107-5.2.3, Repair Segmented Circle Marker System	LS	1
16	Item L-108-5.1.1, Trenching for PVC Conduit, 24-in minimum depth	LF	15,300
17	Item L-108-5.1.2, #8 AWG, 600V, L-824, Type C, Cable Installed in Duct Bank or Conduit	LF	19,100
18	Item L-108-5.1.3, #6 AWG, L-824, Type C, Solid Bare Counterpoise Wire, Installed Above Duct Bank or Conduit, Including Connections/Terminations	LF	15,700
19	Item L-109-7.1.1, Existing Electrical Vault Building Modifications	LS	1
20	Item L-110-5.1.1, Remove Existing Bore or Duct Bank	LF	100
21	Item L-110-5.1.2, Non-Encased Electrical Conduit, 2-inch Sch 40 PVC, Installed in Trench	LF	15,300
22	Item L-110-5.1.3, Non-Encased Electrical Conduit, 2-inch Sch 80 HDPE, Installed by Bore	LF	450
23	Item L-115-5.2.1, Remove Existing Electrical Handholes	EA	11
24	Item L-115-5.2.2, Remove Concrete Surrounding Existing Electrical Handhole, Reuse and Install 36" Concrete Ring	EA	11
25	Item L-115-5.2.3, Electrical Handhole, 12" L-867B Pull Box with Concrete Encasement	EA	30
26	Item L-125-5.1.1, Removal of Existing Runway Edge Lights	EA	52
27	Item L-125-5.1.2, Removal of Existing Taxiway Centerline Markers	LS	1
28	Item L-125-5.1.3, Removal of Existing Runway and Taxiway Guidance Signs, including Foundations	EA	13
29	Item L-125-5.1.4, L-853, Taxiway Centerline Markers, Type 1, Semiflush	EA	119
30	Item L-125-5.1.5, L-861, White/Yellow, LED Fixtures, Runway Edge Light, Base Mounted	EA	38
31	Item L-125-5.1.6, L-861E, Red/Green, LED Fixtures, Runway Threshold light, Base Mounted	EA	16
32	Item L-125-5.1.7, L-858Y or L-858R One Module, Size 1, Style 2, Class 1, Mode 2 Internally Lighted LED Guidance Sign, Base Mounted	EA	6
33	Item L-125-5.1.8, L-858L or L-858R Two Module, Size 1, Style 2, Class 1, Mode 2 Internally Lighted LED Guidance Sign, Base Mounted	EA	3
34	Item L-125-5.1.9, L-858L or L-858R Three Module, Size 1, Style 2, Class 1, Mode 2 Internally Lighted LED Guidance Sign, Base Mounted	EA	2
35	Item L-125-5.1.10, L-891(L), Style A, Class I, PAPI-2 System, With Baffles, Including Foundation	EA	2
36	TxDOT Item 316, Chip Seal Coat with Asphalt Coated Aggregate	SY	41,500
37	TxDOT Item 341, Dense Graded Hot-Mix Asphalt, 2.0-inch Overlay	Ton	4,740

ADDITIVE ALTERNATE No 1

BID ITEM	SPEC No. & DESCRIPTION	QUANTITY	UNIT
AA1-1	Item L-109-7.1.2, Removal of Existing Electrical Vault Building, Equipment and Foundation	LS	1
AA1-2	Item L-109-7.1.3, Installation of Airport Transformer Vault Equipment in New Electrical Vault Building	LS	1
AA1-3	Deduct of Base Bid Item No. 19	LS	(1)

ADDITIVE ALTERNATE No 2

BID ITEM	SPEC No. & DESCRIPTION	QUANTITY	UNIT
AA2-1	Item P-101-4.1, Mill Existing Asphalt Surface, Millings to be Removed by Contractor	SY	130
AA2-2	Item P-101-4.2, Clean and Seal Existing Cracks Greater than 1/2 inch wide, Including Sealant, Prior to Placement of TxDOT Item 316	LF	14,730
AA2-3	Item T-901-5.1, Seeding and Fertilizing	AC	0.50
AA2-4	Item T-905-5.1, Topsoil (Furnished from Off the Site)	CY	43
AA2-5	TxDOT Item 316, Chip Seal Coat with Asphalt Coated Aggregate	SY	7,820
AA2-6	TxDOT Item 341, Dense Graded Hot-Mix Asphalt, 2.0-inch Overlay	Ton	900
AA2-7	Deduct of Milling Transitions	SY	(340)

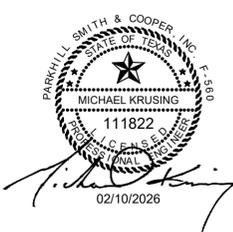
ADDITIVE ALTERNATE No 3

BID ITEM	SPEC No. & DESCRIPTION	QUANTITY	UNIT
AA3-1	Item P-101-4.1, Mill Existing Asphalt Surface, Millings to be Removed by Contractor	SY	1,900
AA3-2	Item P-101-4.2, Clean and Seal Existing Cracks Greater than 1/2 inch wide, Including Sealant, Prior to Placement of TxDOT Item 316	LF	15,330
AA3-3	Item T-901-5.1, Seeding and Fertilizing	AC	0.50
AA3-4	Item T-905-5.1, Topsoil (Furnished from Off the Site)	CY	35
AA3-5	TxDOT Item 316, Chip Seal Coat with Asphalt Coated Aggregate	SY	9,840
AA3-6	TxDOT Item 341, Dense Graded Hot-Mix Asphalt, 2.0-inch Overlay	Ton	1,130
AA3-7	Deduct of Milling Transitions	SY	(2,180)

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G-005	Storm Water Pollution Prevention Plan (Site Plan)
G-006	Storm Water Pollution Prevention Plan (Details)
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C-102	Site Demolition Plan Sta 10+00 To 21+00
C-103	Site Demolition Plan Sta 21+00 To 32+00
C-104	Site Demolition Plan Sta 32+00 To 43+00
C-105	Geometry Plan Sta 0+00 To 10+00
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C-109	Runway 16-34 Plan & Profile Sta 0+00 to 10+00
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E-103	Runway 16-34 Electrical Demolition Plan
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E-507	Electrical Detail Vault Layout
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Parkhill

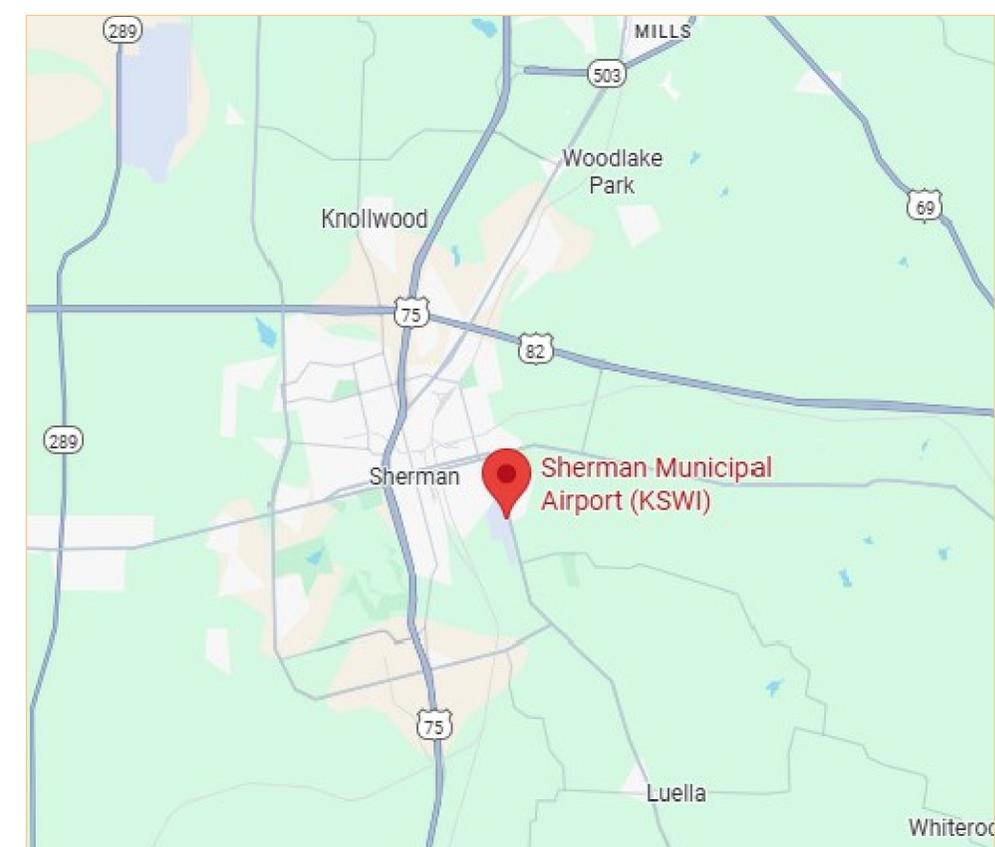


Parkhill.com

Sherman Municipal Airport
Airfield Pavement & Electrical Improvements



VICINITY MAP



CLIENT
Sherman, Texas
1200 S. Dewey Ave.
Sherman, Texas

PROJECT NO.
43676.24

#	DATE	DESCRIPTION
2	02/10/2026	Addendum No. 2
1	11/03/2025	Bid Submittal Package

Location Map,
Vicinity Map, Bid
Quantities &
Sheet Index
G-002

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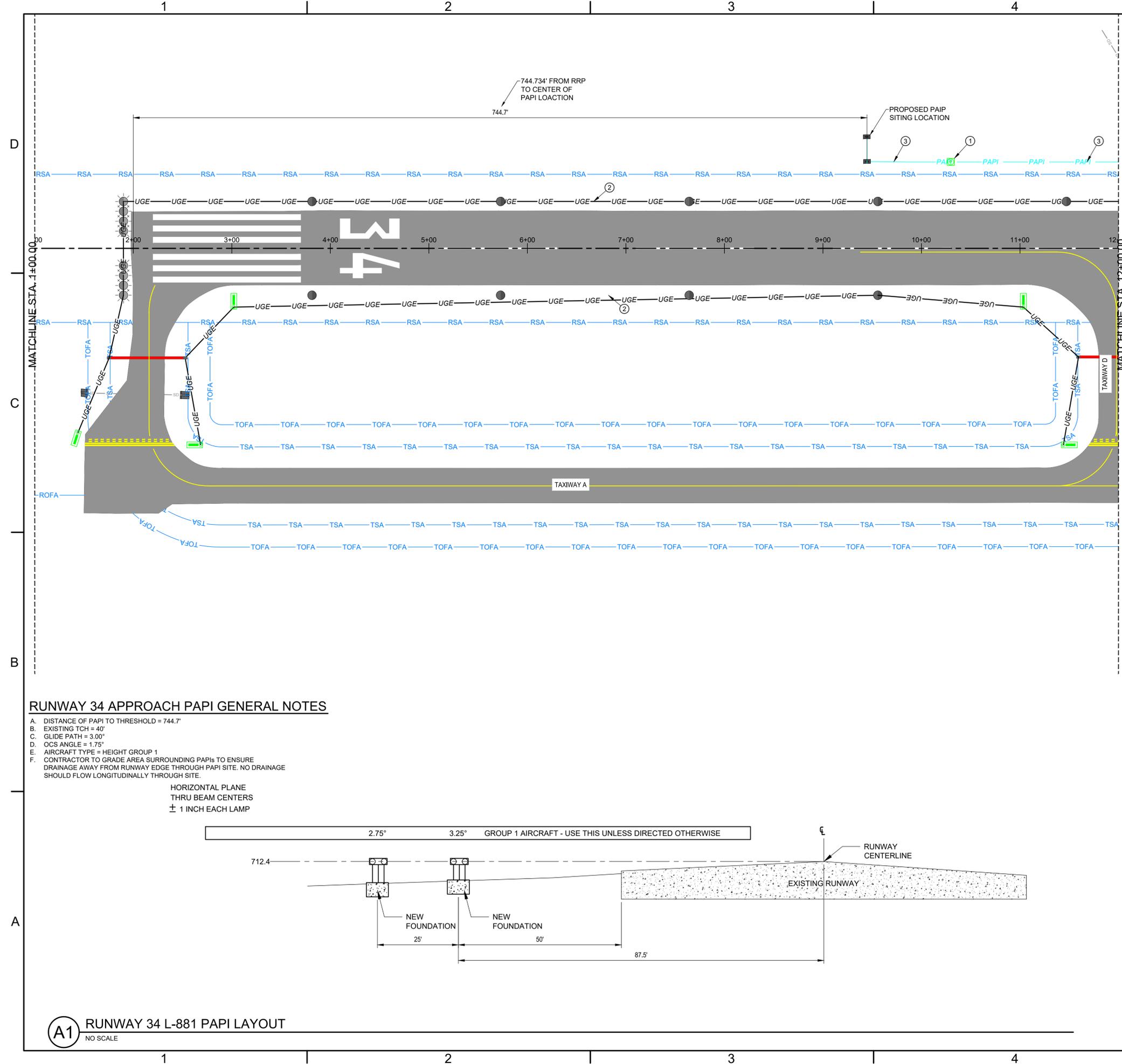
CLIENT
Sherman, Texas
 1200 S. Dewey Ave.
 Sherman, Texas

PROJECT NO.
 43676.24

#	DATE	DESCRIPTION
2	02/10/2026	Addendum No. 2
1	11/03/2025	Bid Submittal Package

Runway PAPI 34 Layout Plan

E-109



GENERAL NOTES

- A. CONTRACTOR SHALL COORDINATE CONSTRUCTION SCHEDULE WITH OWNER AND ENGINEER.
- B. CONTRACTOR TO LAY OUT INTENDED CONDUIT RUN, BORING LOCATION, ETC. PRIOR TO BEGINNING TRENCHING TO ENSURE ANY CONFLICTS CAN BE DISCUSSED IN A MANNER TO AVOID TIME DELAYS.
- C. CONTRACTOR SHALL COORDINATE FAA FLIGHT CHECK FOR COMPLETED PAPI-2 INSTALLATION WITH CITY, ENGINEER AND AGENT. CONTRACTOR SHALL BE ON SITE DURING FLIGHT CHECK TO ADDRESS NECESSARY ADJUSTMENTS. TXDOT SHALL COVER FAA COSTS FOR FLIGHT CHECK.
- D. PAPIs TO BE INSTALLED WITH INTERNAL Baffles.

KEY NOTES

- AS INDICATED BY: (Ⓞ)
1. NEW PULLBOX. SEE DETAIL C1/E-503.
 2. NEW RUNWAY LIGHT SERIES CIRCUIT, PLACED IN (2" SCH) 40 PVC. PROVIDE TRENCH, CONDUITS, SOD AND BACKFILL, AS NECESSARY (TYPICAL). SEE DETAIL A5/E-503.
 3. NEW RUNWAY 34 PAPI BEACON CIRCUIT, PLACED IN (2" SCH) 40 PVC. PROVIDE TRENCH, CONDUITS, AND BACKFILL, AS NECESSARY (TYPICAL). SEE DETAIL A5/E-503.
 4. NEW RUNWAY 16 PAPI BEACON CIRCUIT, PLACED IN (2" SCH) 40 PVC. PROVIDE TRENCH, CONDUITS, AND BACKFILL, AS NECESSARY (TYPICAL). SEE DETAIL A5/E-503.

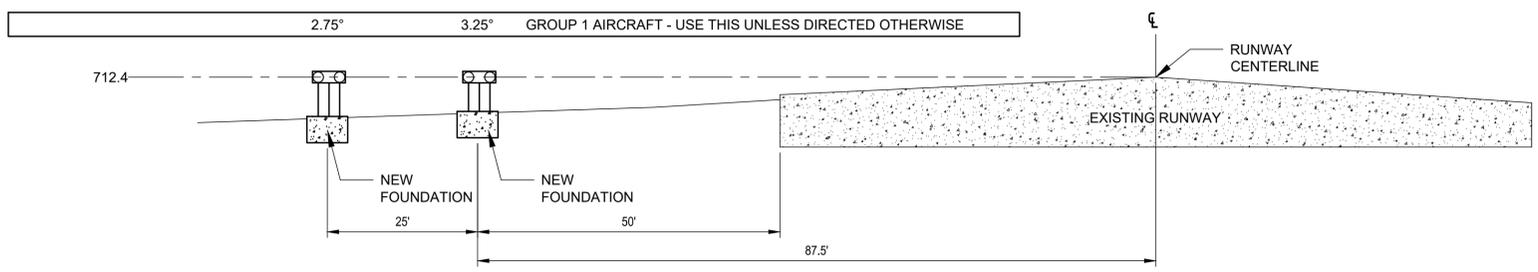
LEGEND

	PROPOSED ELECTRICAL UNDERGROUND CONDUIT
	PROPOSED PAPI ELECTRICAL CABLE
	NEW AIRFIELD DIRECTION SIGN AND FOUNDATION
	NEW MEDIUM INTENSITY RUNWAY EDGE LIGHTS, WHITE/WHITE LENSES. ALL WHITE/WHITE LENSES INDICATE APPROACH OF THE LAST 2000' OF RUNWAY. SEE SHEET E-501
	PROPOSED ELECTRICAL DUCT BANK
	NEW MEDIUM INTENSITY RUNWAY EDGE LIGHTS, WHITE/YELLOW LENSES. SEE DETAIL A4/E-501
	NEW PAPI-2. SEE SHEET E-505
	NEW RUNWAY THRESHOLD LIGHTS, GREEN/RED LENSES. GREEN LENSES FACE RUNWAY APPROACH. SEE SHEET E-501
	PROPOSED JUNCTION/PULL BOX
	NEW PRIMARY WIND CONE. SEE SHEET E-506
	NEW ROTATING BEACON. SEE SHEET E-504
	PROPOSED ASPHALT PAVEMENT TO 2.0" OVERLAY
	EXISTING BUILDINGS
	EXISTING AIRFIELD PAVEMENT
	EXISTING ELECTRICAL DUCT BANK AND CONDUIT TO BE REUSED IF POSSIBLE
	EXISTING JUNCTION/PULL BOX
	EXISTING STORM WATER DRAINAGE SYSTEM
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	TAXIWAY SAFETY AREA
	TAXIWAY OBJECT FREE AREA

RUNWAY 34 APPROACH PAPI GENERAL NOTES

- A. DISTANCE OF PAPI TO THRESHOLD = 744.7'
- B. EXISTING TCH = 40'
- C. GLIDE PATH = 3.00°
- D. OCS ANGLE = 1.75°
- E. AIRCRAFT TYPE = HEIGHT GROUP 1
- F. CONTRACTOR TO GRADE AREA SURROUNDING PAPIs TO ENSURE DRAINAGE AWAY FROM RUNWAY EDGE THROUGH PAPI SITE. NO DRAINAGE SHOULD FLOW LONGITUDINALLY THROUGH SITE.

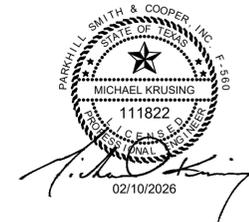
HORIZONTAL PLANE
 THRU BEAM CENTERS
 ± 1 INCH EACH LAMP



A1 RUNWAY 34 L-881 PAPI LAYOUT

NO SCALE

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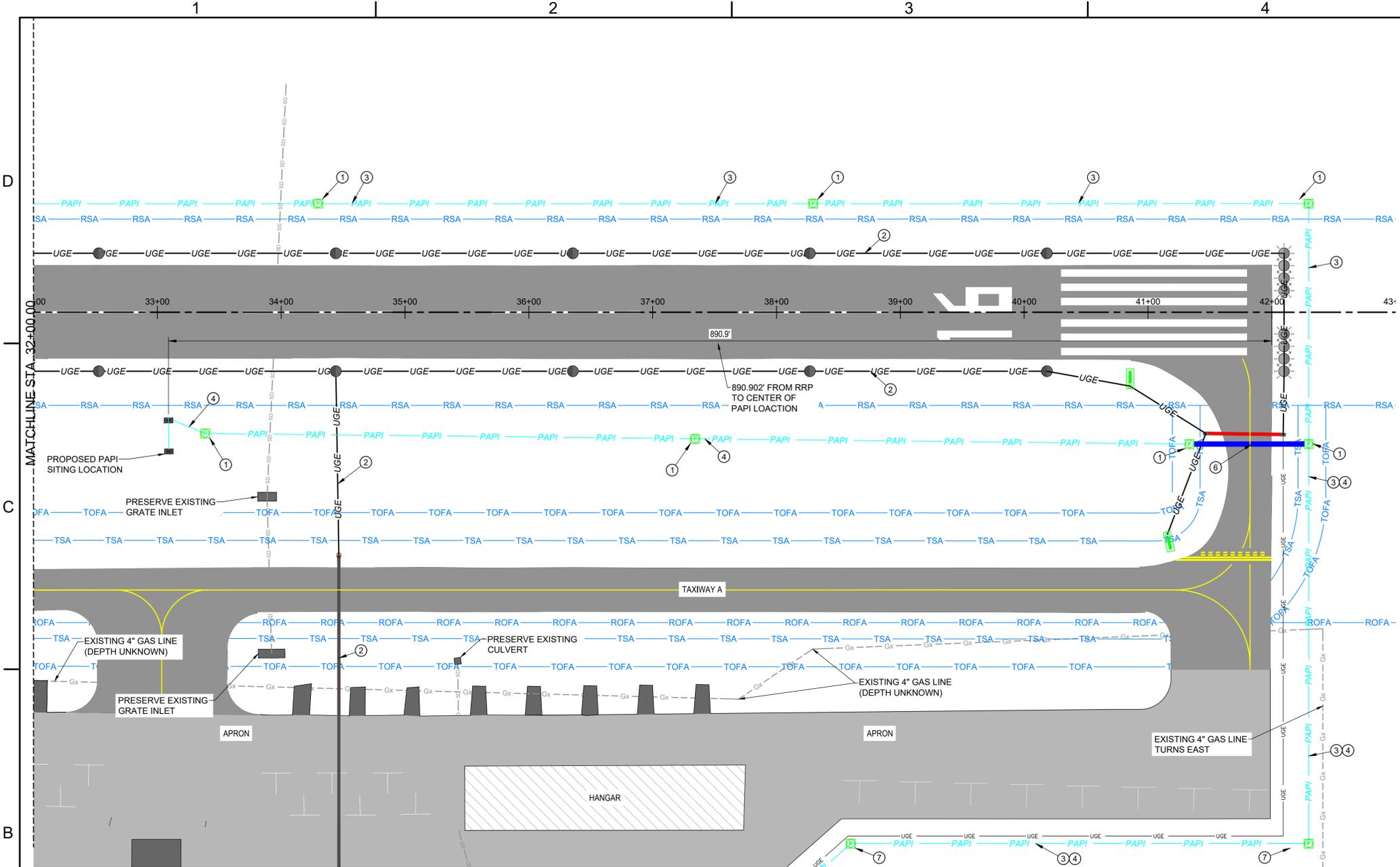
CLIENT
 Sherman, Texas
 1200 S. Dewey Ave.
 Sherman, Texas

PROJECT NO.
 43676.24

#	DATE	DESCRIPTION
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1	11/03/2025	Bid Submittal Package

Runway PAPI 16 Layout Plan

E-110



GENERAL NOTES

- CONTRACTOR SHALL COORDINATE CONSTRUCTION SCHEDULE WITH OWNER AND ENGINEER.
- CONTRACTOR TO LAY OUT INTENDED CONDUIT RUN, BORING LOCATION, ETC. PRIOR TO BEGINNING TRENCHING TO ENSURE ANY CONFLICTS CAN BE DISCUSSED IN A MANNER TO AVOID TIME DELAYS.
- CONTRACTOR SHALL COORDINATE FAA FLIGHT CHECK FOR COMPLETED PAPI-2 INSTALLATION WITH CITY, ENGINEER AND AGENT. CONTRACTOR SHALL BE ON SITE DURING FLIGHT CHECK TO ADDRESS NECESSARY ADJUSTMENTS. TxDOT SHALL COVER FAA COSTS FOR FLIGHT CHECK.
- PAPIS TO BE INSTALLED WITH INTERNAL Baffles.

KEY NOTES

- AS INDICATED BY: (Ⓞ)
- NEW PULLBOX. SEE DETAIL C1/E-503.
 - NEW RUNWAY LIGHT SERIES CIRCUIT, PLACED IN (2" SCH) 40 PVC. PROVIDE TRENCH, CONDUITS, SOD AND BACKFILL, AS NECESSARY (TYPICAL). SEE DETAIL A5/E-503.
 - NEW RUNWAY 34 PAPI BEACON CIRCUIT, PLACED IN (2" SCH) 40 PVC. PROVIDE TRENCH, CONDUITS, AND BACKFILL, AS NECESSARY (TYPICAL). SEE DETAIL A5/E-503.
 - NEW RUNWAY 16 PAPI BEACON CIRCUIT, PLACED IN (2" SCH) 40 PVC. PROVIDE TRENCH, CONDUITS, AND BACKFILL, AS NECESSARY (TYPICAL). SEE DETAIL A5/E-503.

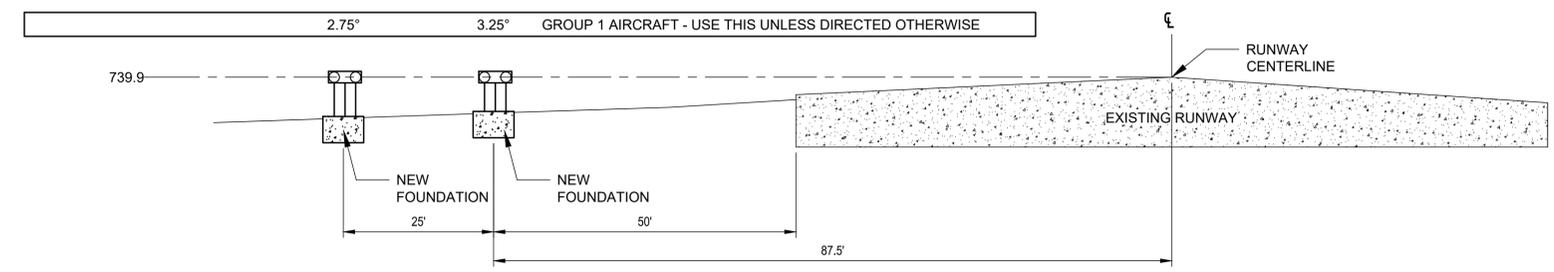
LEGEND

	PROPOSED ELECTRICAL UNDERGROUND CONDUIT
	PROPOSED PAPI ELECTRICAL CABLE
	NEW AIRFIELD DIRECTION SIGN AND FOUNDATION
	NEW MEDIUM INTENSITY RUNWAY EDGE LIGHTS, WHITE/WHITE LENSES. ALL WHITE/WHITE LENSES INDICATE APPROACH OF THE LAST 2000' OF RUNWAY. SEE SHEET E-501
	PROPOSED ELECTRICAL DUCT BANK
	NEW MEDIUM INTENSITY RUNWAY EDGE LIGHTS, WHITE/YELLOW LENSES. SEE DETAIL A4/E-501
	NEW PAPI-2. SEE SHEET E-505
	NEW RUNWAY THRESHOLD LIGHTS, GREEN/RED LENSES. GREEN LENSES FACE RUNWAY APPROACH. SEE SHEET E-501
	PROPOSED JUNCTION/PULL BOX
	NEW PRIMARY WIND CONE. SEE SHEET E-506
	NEW ROTATING BEACON. SEE SHEET E-504
	PROPOSED ASPHALT PAVEMENT TO 2.0" OVERLAY
	EXISTING BUILDINGS
	EXISTING AIRFIELD PAVEMENT
	EXISTING ELECTRICAL DUCT BANK AND CONDUIT TO BE REUSED IF POSSIBLE
	EXISTING JUNCTION/PULL BOX
	EXISTING STORM WATER DRAINAGE SYSTEM
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	TAXIWAY SAFETY AREA
	TAXIWAY OBJECT FREE AREA

RUNWAY 16 APPROACH PAPI GENERAL NOTES

- DISTANCE OF PAPI TO THRESHOLD = 890.9'
- EXISTING TCH = 40'
- GLIDE PATH = 3.00°
- OCS ANGLE = 1.75°
- AIRCRAFT TYPE = HEIGHT GROUP 1
- CONTRACTOR TO GRADE AREA SURROUNDING PAPIs TO ENSURE DRAINAGE AWAY FROM RUNWAY EDGE THROUGH PAPI SITE. NO DRAINAGE SHOULD FLOW LONGITUDINALLY THROUGH SITE.

HORIZONTAL PLANE
 THRU BEAM CENTERS
 ± 1 INCH EACH LAMP



A1 RUNWAY 16 L-81 PAPI LAYOUT

NO SCALE

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CLIENT
Sherman, Texas

1200 S. Dewey Ave.
Sherman, Texas

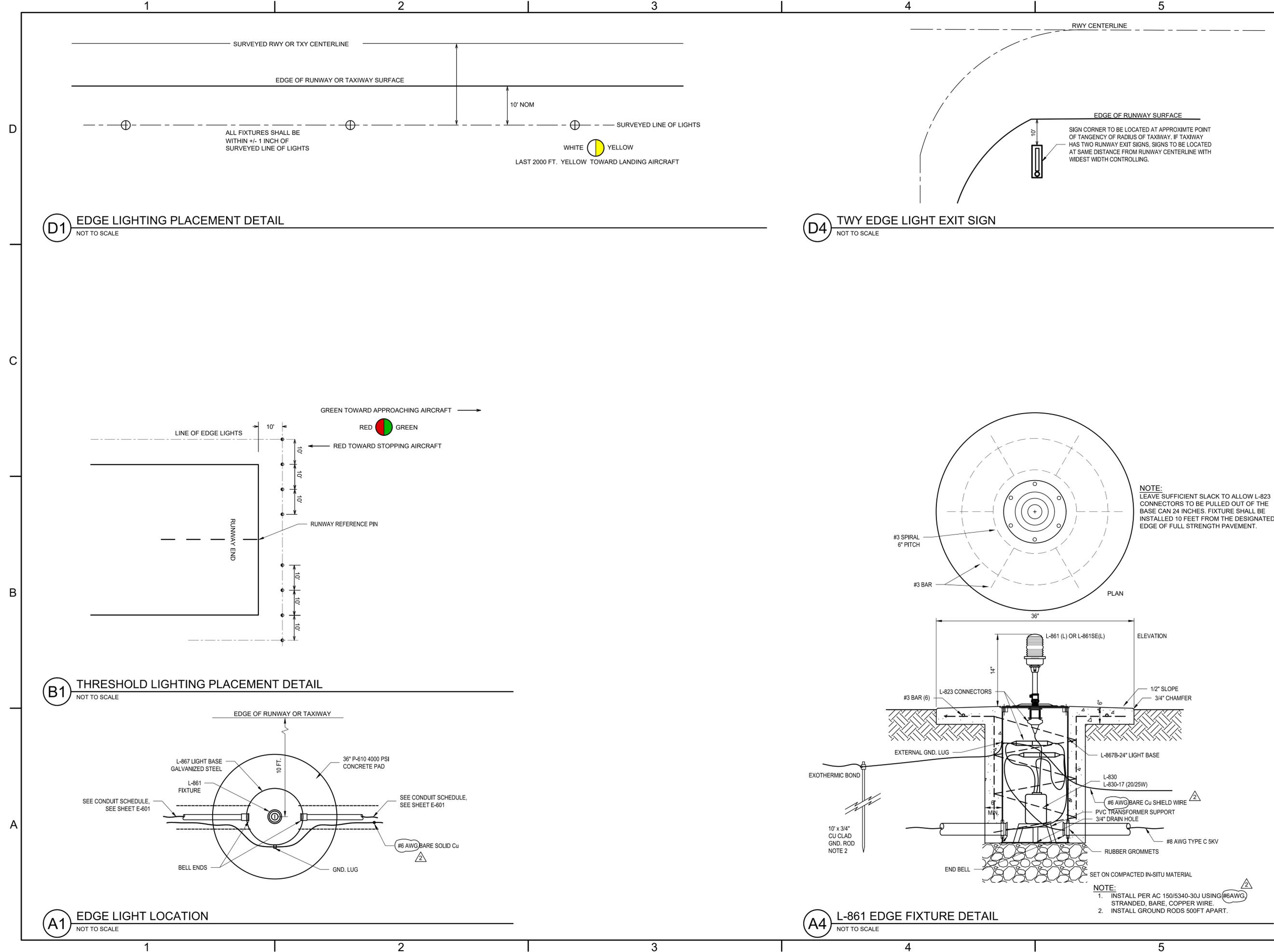
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DATE DESCRIPTION

Runway Lighting Details

E-501



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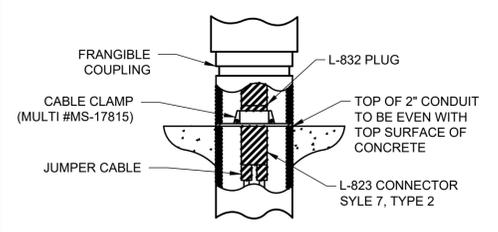


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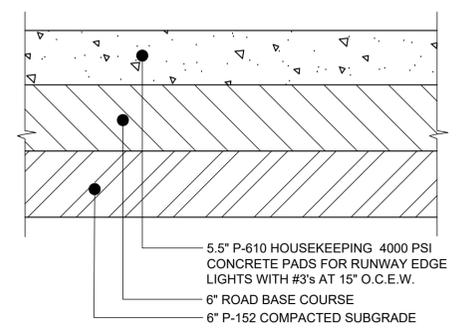
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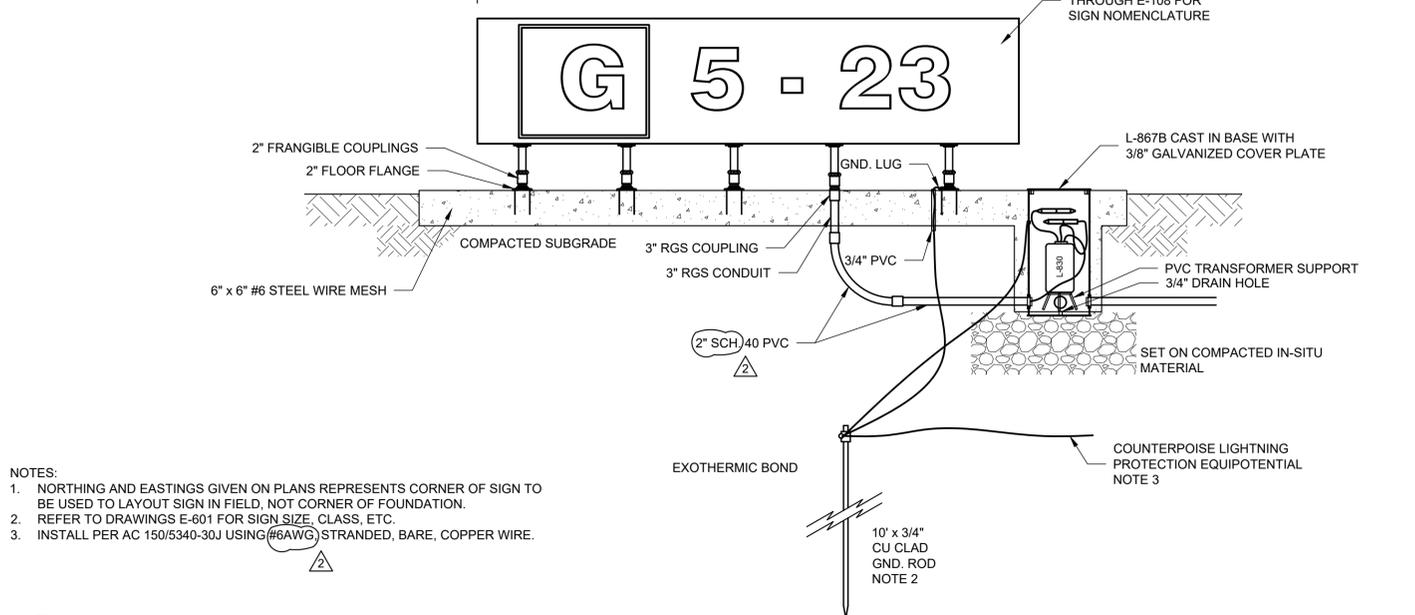
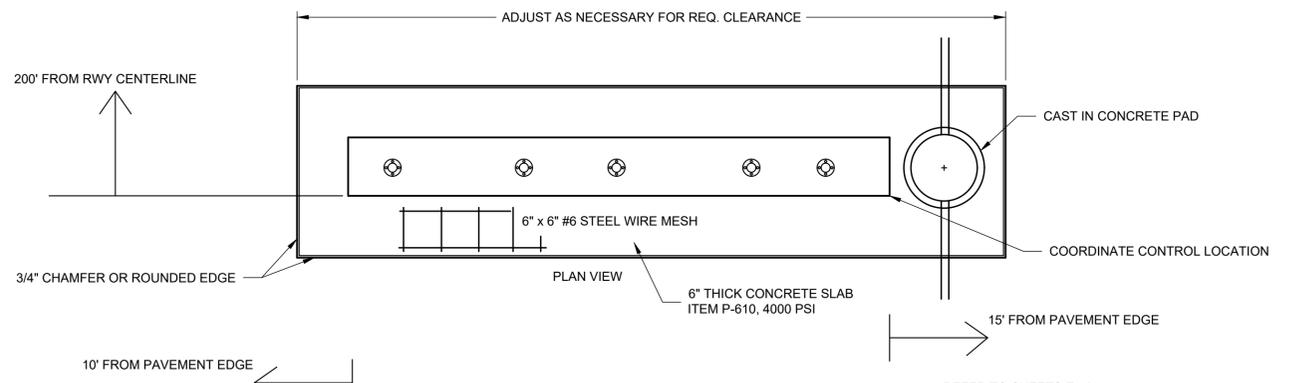
Runway Signs Details E-502



D1 ELECTRICAL CONNECTION DETAIL
 NOT TO SCALE

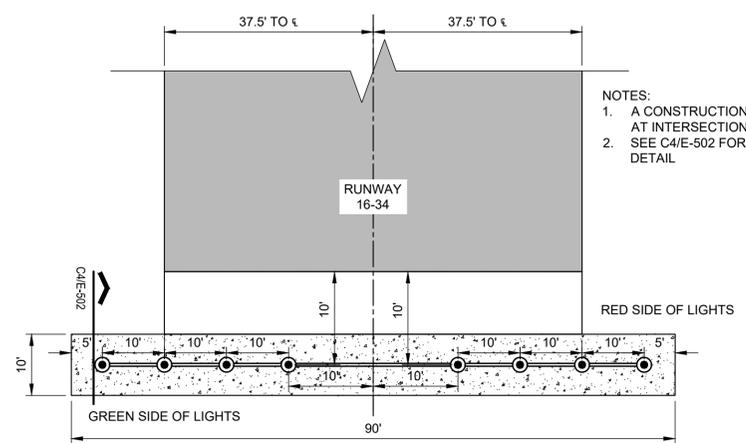


C4 CONCRETE PAD AT THRESHOLD
 NOT TO SCALE



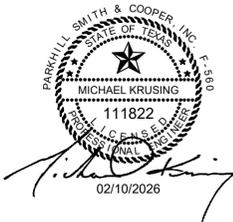
- NOTES:**
1. NORTHING AND EASTINGS GIVEN ON PLANS REPRESENTS CORNER OF SIGN TO BE USED TO LAYOUT SIGN IN FIELD, NOT CORNER OF FOUNDATION.
 2. REFER TO DRAWINGS E-601 FOR SIGN SIZE, CLASS, ETC.
 3. INSTALL PER AC 150/5340-30J USING #6(AWG) STRANDED, BARE, COPPER WIRE.

A1 TYPICAL INTERNALLY LIGHTED SIGN
 NOT TO SCALE



A4 THRESHOLD LIGHTING DETAIL
 NOT TO SCALE

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CLIENT
Sherman, Texas

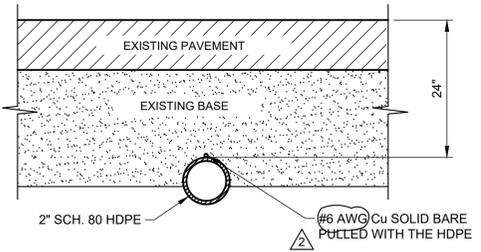
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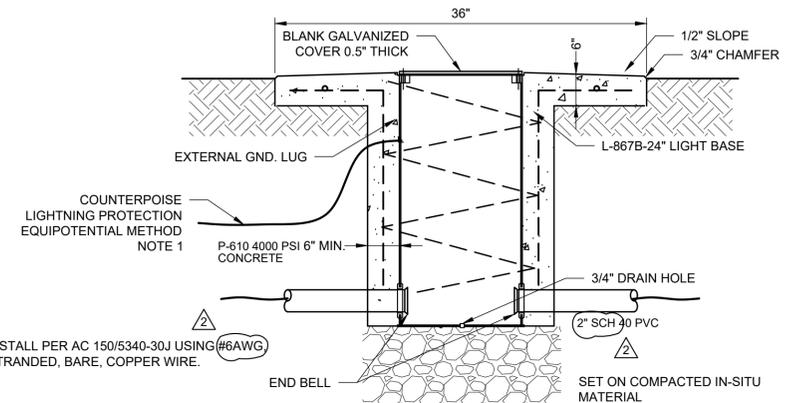
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Runway Lights and Circuit Details

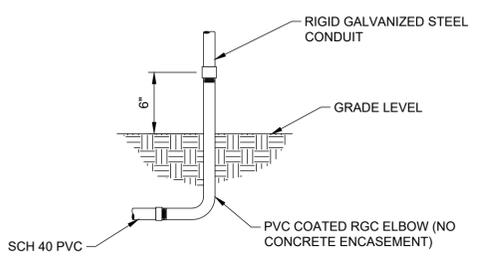
E-503



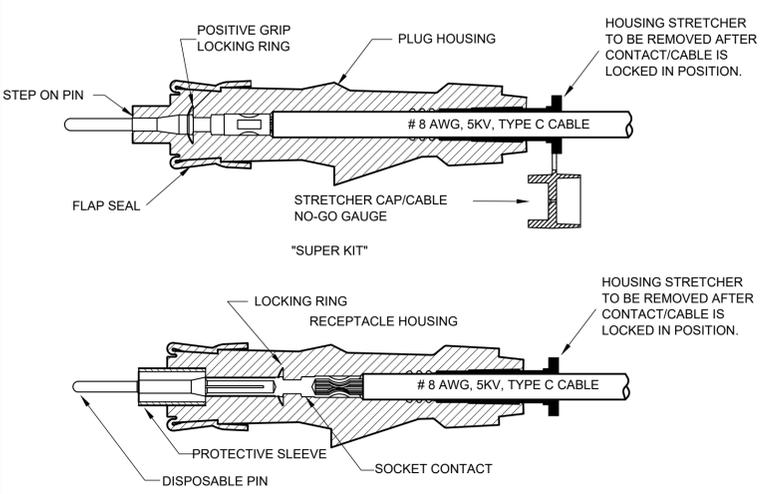
D3 L-110 BORE UNDER EXISTING PAVEMENT DETAIL
NOT TO SCALE



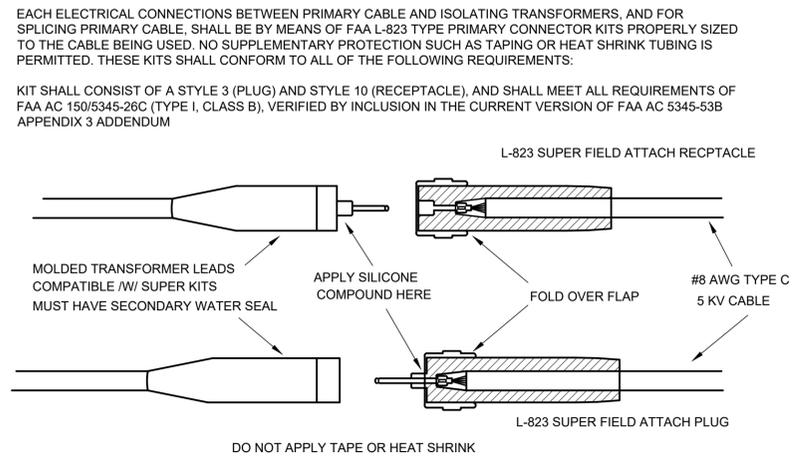
C1 L-115 ELECTRICAL JUNCTION/PULL BOXES
NOT TO SCALE



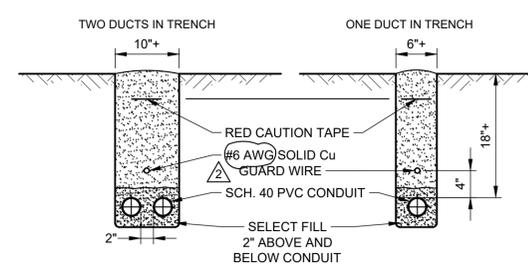
C3 BELOW TO ABOVE GROUND CONDUIT TRANSITION
NOT TO SCALE



A1 AC 150-5340-30J FIELD ATTACH HIGH VOLTAGE CONNECTION DETAIL
NOT TO SCALE



EACH ELECTRICAL CONNECTIONS BETWEEN PRIMARY CABLE AND ISOLATING TRANSFORMERS, AND FOR SPLICING PRIMARY CABLE, SHALL BE BY MEANS OF FAA L-823 TYPE PRIMARY CONNECTOR KITS PROPERLY SIZED TO THE CABLE BEING USED. NO SUPPLEMENTARY PROTECTION SUCH AS TAPING OR HEAT SHRINK TUBING IS PERMITTED. THESE KITS SHALL CONFORM TO ALL OF THE FOLLOWING REQUIREMENTS:
KIT SHALL CONSIST OF A STYLE 3 (PLUG) AND STYLE 10 (RECEPTACLE), AND SHALL MEET ALL REQUIREMENTS OF FAA AC 150/5345-26C (TYPE I, CLASS B), VERIFIED BY INCLUSION IN THE CURRENT VERSION OF FAA AC 5345-53B APPENDIX 3 ADDENDUM



A5 L-110 TRENCH DETAIL
NOT TO SCALE

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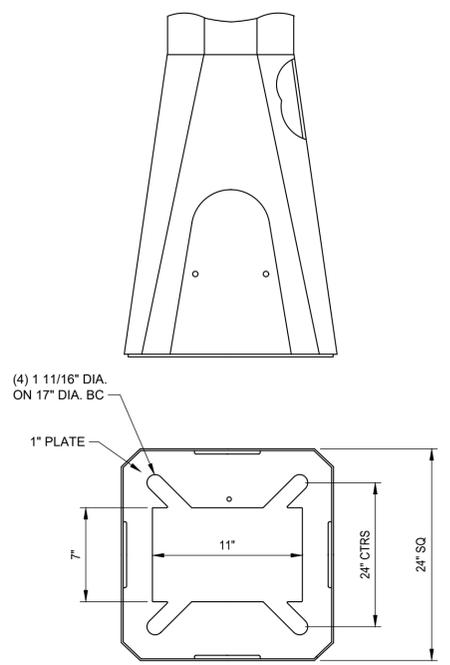
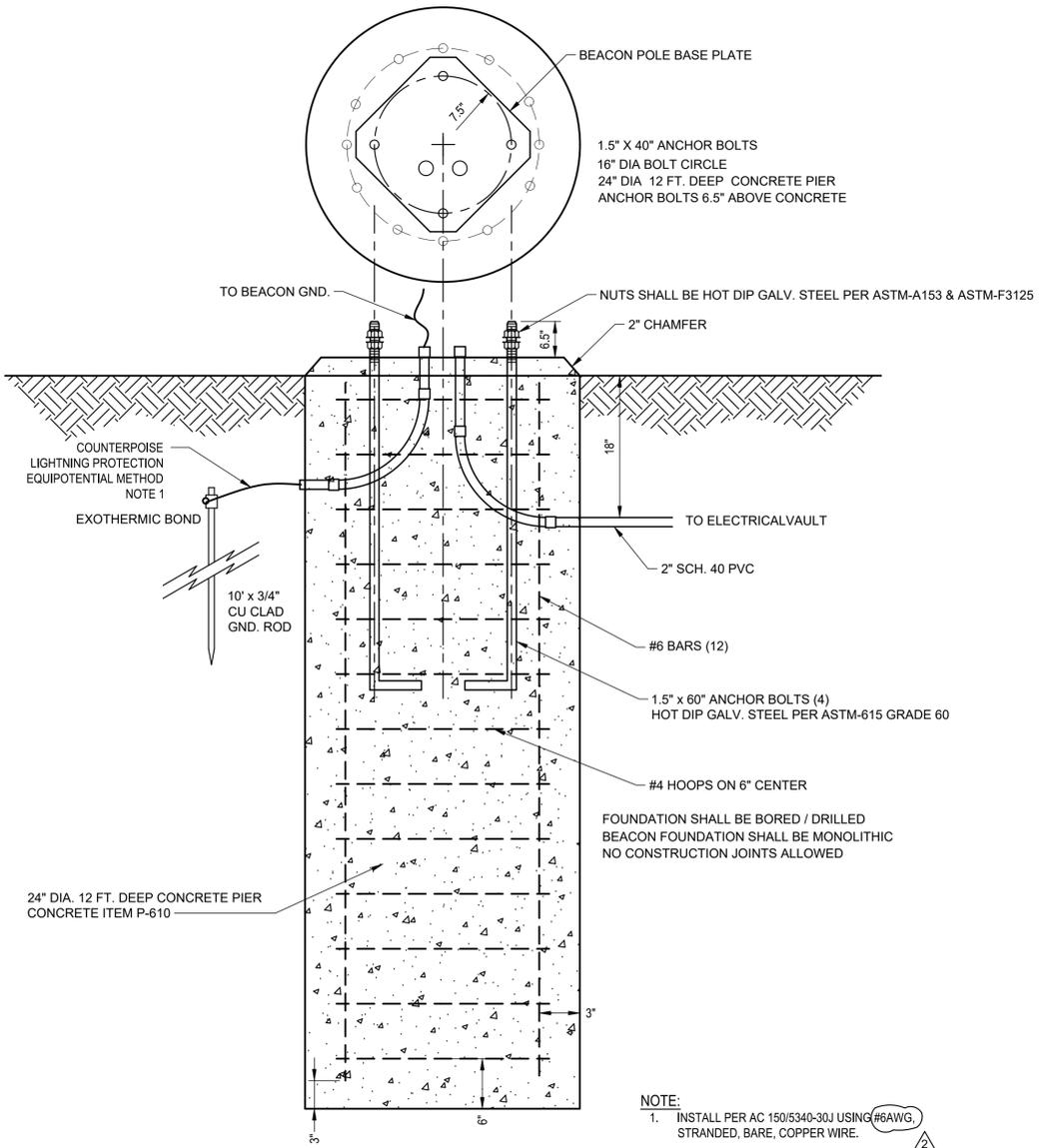
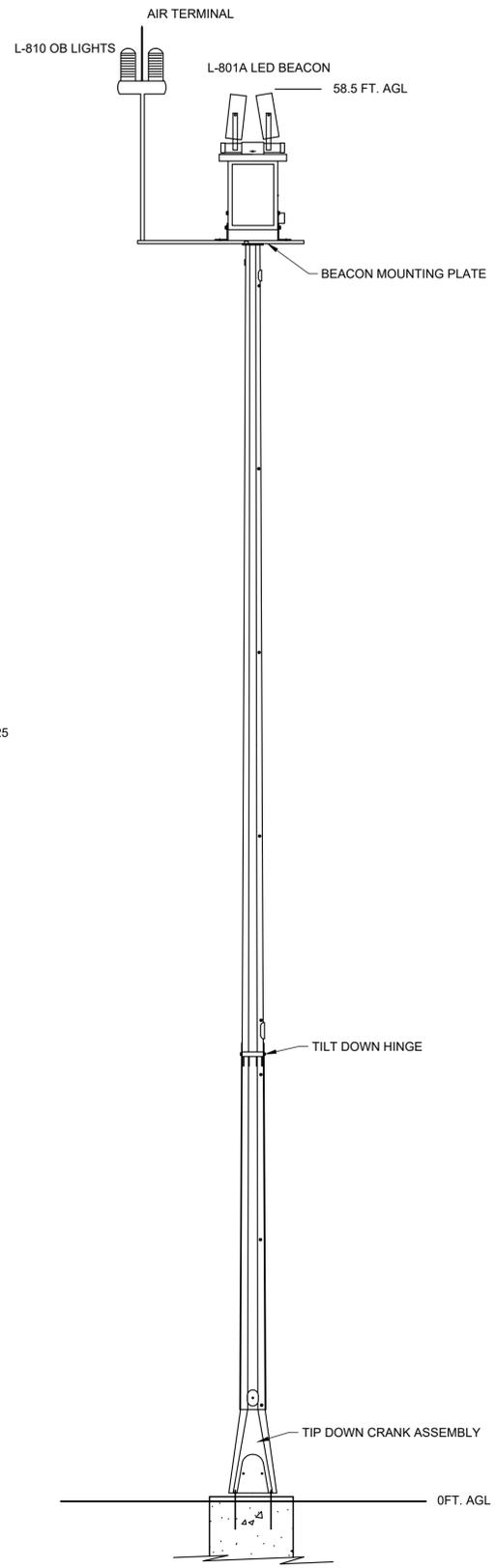
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4

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GENERAL NOTES

- A. THE SITING OF THE BEACON CAN BE FOUND ON SHEET E-108.
- B. REFER TO FAA AC 150/5370-10H ITEM L-101 AND L-103 FOR INSTALLATION INSTRUCTIONS.



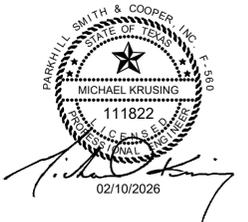
A1 50 FT. TIP-DOWN BEACON POLE FOUNDATION
NOT TO SCALE

A3 55 FT. TIP-DOWN BEACON POLE
NOT TO SCALE

A5 55 FT. TIP-DOWN POLE BASE DETAIL
NOT TO SCALE

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Parkhill



Parkhill.com

Sherman Municipal Airport
Airfield Pavement & Electrical Improvements



CLIENT
Sherman, Texas
1200 S. Dewey Ave.
Sherman, Texas

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L-810A Beacon
E-504

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D

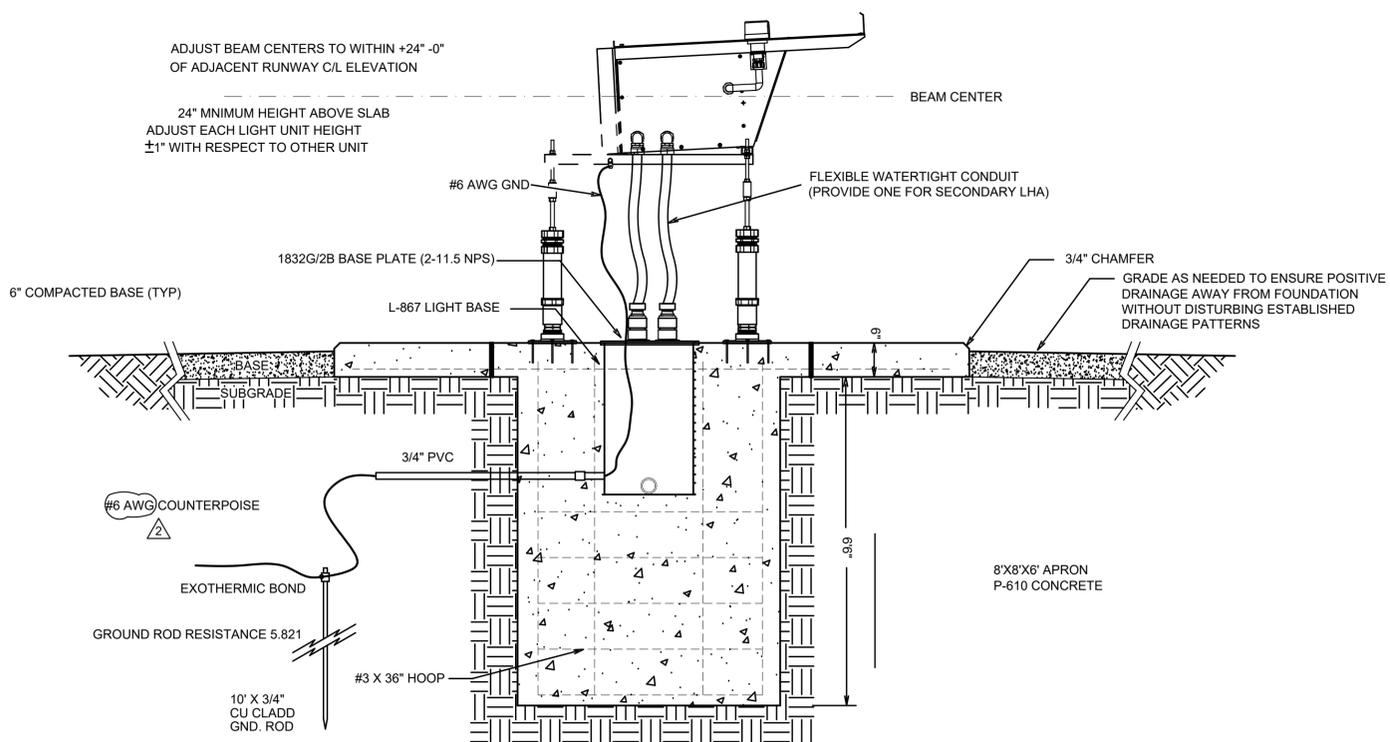
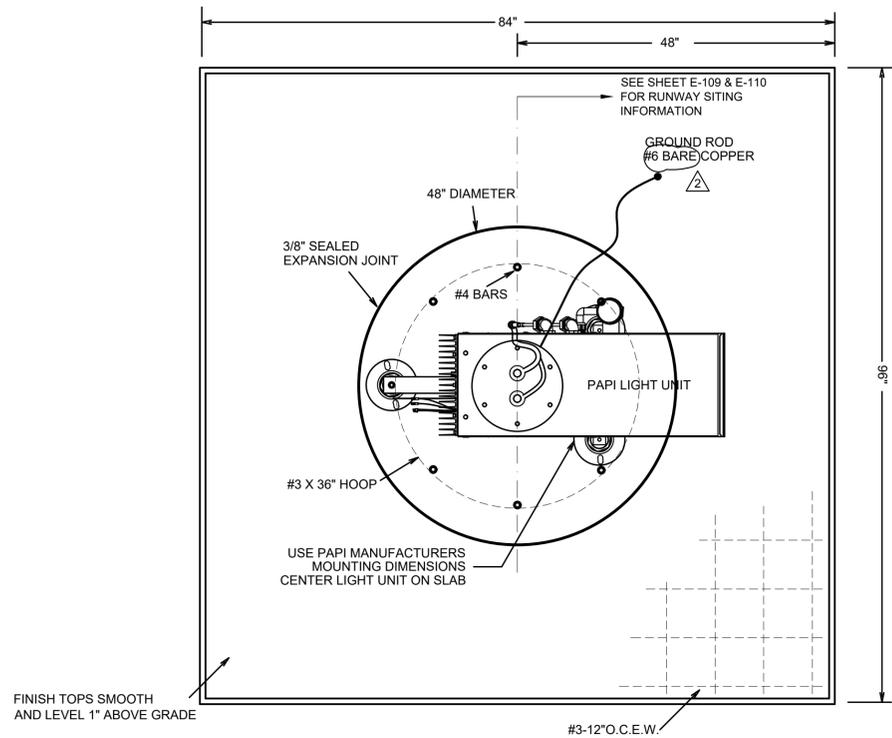
C

B

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GENERAL NOTES

1. SOIL BEARING CAPACITY-THE SOIL HAS A MINIMUM BEARING CAPACITY OF 4000 PSI. SO INVESTIGATION WAS CONDUCTED AT THE SITE PRIOR TO CONSTRUCTION THE SOIL CONDITION AT THE BASE LEVEL OF EACH FOUNDATION WAS VERIFIED FOR ADEQUACY.
2. CONCRETE FOUNDATIONS SHALL HAVE VERTICAL SURFACES SMOOTH.
3. FOUNDATION DEPTH IS SHOWN ON THE DRAWINGS EXCEPT IN LOCATIONS WHERE THERE WAS A FIRM BEDROCK LESS THAN THIS DEPTH. THE BOTTOM OF ALL EXCAVATIONS WAS FREE OF WATER AND LOOSE EARTH.
4. CONCRETE WORK TO BE IN ACCORDANCE WITH FAA ITEM P-610.
5. DRILL HOLES AND INSTALL EXPANSION TYPE ANCHOR BOLTS WHEN PAPI UNITS ARE ACCURATELY LOCATED.
6. 2" [50cm] EMT LENGTH IS REQUIRED SO THAT THE BEAM CENTERS OF ALL LIGHT UNITS IS WITHIN 1" [25cm] OF A HORIZONTAL PLANE. THE HORIZONTAL PLAN IS WITHIN ±1" [±30cm] OF THE ELEVATION OF THE RUNWAY CROWN ADJACENT TO THE PAPI UNITS.
7. FOUNDATION STRUCTURES ARE MODIFIED AS DICTATED BY LOCAL SOIL AND CLIMATE CONDITIONS.
8. WHERE REQUIRED AT PAPI FOUNDATIONS, FILL TO BE PLACED IN LAYERS NOT EXCEEDING 6" [15cm]. EACH LAYER TO BE THOROUGHLY COMPACTED TO 95% OF MAX. DENSITY AT OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D-698.
9. UNUSED SHIELDED PAIRS IN THE CONDUIT FITTING TO BE CONNECTED TO EARTH GROUND FITTING.
10. TO PREVENT SEIZURE, ANTI-SEIZE COMPOUND TO BE ADDED. NSN# 8033-00-251-3880, MANUFACTURED BY JET-LUBE, INC., HOUSTON, TX OR EQUAL.
11. ALL ANCHOR BOLTS, WASHERS, NUTS, UNISTRUT AND CAPS TO BE STAINLESS STEEL.
12. ALL CONDUITS TO BE LEVELED BEFORE AND AFTER PLACING CONCRETE.
13. CONTRACTOR TO MEASURE THE LENGTH OF EACH LHA TO CONFIRM SPACING OF PAPI LEGS. THE SUPPORT LEGS AND BRACKET THAT HOLD THE LHA TO BE FLUSH WITH NO GAP.
14. FOLLOWING INSTALLATION OF ALL LHA'S, CONTRACTOR TO DOCUMENT HEIGHT BETWEEN CONCRETE PAD AND BOTTOM OF LHA ON RECORD DRAWINGS.
15. FOLLOWING FLIGHT CHECK AND AFTER CONFIRMING AIMING ANGLE FOR EACH LHA, CONTRACTOR TO PROVIDE AND INSTALL AIMING ANGLE LABEL ON EACH LHA.
16. INCLUDE BAFFLES ON NEW PAPI LHAs.



A1 L-881(L), STYLE A, CLASS I, PAPI-2 FOUNDATION DETAIL FOR PRIMARY AND SECONDARY LHA
NOT TO SCALE

Parkhill



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**Sherman Municipal
Airport**
Airfield Pavement & Electrical Improvements



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PAPI-2 Detail
E-505

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