LOCHNER

Comanche County-City Airport
TxDOT CSJ No. 2223COMAN

ADDENDUM NO. 1

November 7, 2022

TO ALL PROSPECTIVE BIDDERS:

All bidders shall acknowledge receipt of this and all other addenda on page 5 of 5 of the Bid Form. **Failure to acknowledge receipt of an addendum may be cause for rejection of the bid.** This addendum becomes a part of the contract documents. All provisions of the original plans, specifications, and contract documents shall remain in full force and effect, except as modified by this addendum.

A. You are hereby notified of the following amendments to the Bid Form for the subject project. See attached revised bid form.
   1. **Multiple Bid item quantities have been revised.**
   2. **Beacon type in multiple bid items was corrected.**
   3. **Bid item "Remove & Dispose Existing L-824C Direct Buried Cable" was removed**
   4. **Bid item "Bore 2 - 2" HDPE Conduit under existing paving" was added**

B. You are hereby notified of the following amendments to the Contract Documents/Specifications for the subject project.

   1. **Specification L-101 - Airport Rotating Beacons Basis of Payment section has been revised to correct the beacon type.**
   2. **Specification L-105 - Alterations, Removal and Demolitions Basis of Payment section has been revised to remove item "Remove & Dispose Existing L-824C Direct Buried Cable."**
   3. **Specification L-110 - Airport Underground Electrical Duct Banks and Conduits Basis of Payment section has been revised to include "Bore 2 - 2" HDPE Conduit under existing paving" item**

C. You are hereby notified of the following amendments to the Construction Plans for the subject project.

   1. Plan sheet E5 has been revised to include the 2 & 4-WAY 2" Schedule 40 Encased in Earth Detail.

D. A copy of the pre-bid meeting minutes is included with this addendum.

E. Additional Clarification and Questions:

   1. Please provide detail for L867D Pull Can in Earth (Bid Item 24).
      a. Refer to detail on sheet E5.

   2. Please provide list of attendees for the pre-bid meeting.
      a. Attached in this addendum

   3. Will the bid opening be livestreamed, and if not can you please livestream it?
      a. No, we do not have live streaming capabilities for the bid opening.

4. Bid item 3 states "Install L-807 Rotating Beacon with L-807(L) LED Rotating Beacon on Tower" while the detail on sheet E7 is a L-801A please clarify.
    a. L-801A (L) is the correct type of Beacon.

5. Bid item 11 states "Replace L-807 Primary Wind Cone with L-807(L) LED Wind Cone Including Tip Down Pole" The detail on sheet E10 does not show a Tip Down Pole for the Windcone, please clarify.
    a. Tip down pole installation shall be required.

6. Please verify the quantity bid item 23 for the 4w2" bore. The bid item has a quantity of 150 LF while the 1 shot called out on sheet L1 with a quantity of 54LF. There is another bore duct called out on L4 which is 112LF and one more on sheet L5 which is 79LF.
    a. Quantity has been revised.

7. Please verify the size of the bore shotes on L4 and L5.
    a. Both bore sections should be a 2-way conduit.

8. Please clarify pay item for the bore shotes on L4 and L5.
    a. Item 23 Bore 2 - 2" HDPE Conduit under existing paving has been added to the attached revised bid form.

9. Please provide a detail for Bid item 22, "4-Way, 2" PVC Conduit, Sched 40, Encased in Earth"
    a. Detail has been added to Revised plan sheet E5.

10. Please verify quantity for Bid item 22,"4-Way, 2" PVC Conduit, Sched 40, Encased in Earth" and confirm location of this duct bank. Is it the highlighted run below (sheet L1)
    a. Yes. Bid item quantity has been revised on the attached bid form.

11. Please advise, Bid Item 7 states to remove 10,300Lf of direct buried cable however on the plans it calls to abandon the cable.
    a. Cable should be abandoned. Bid item has been revised on the attached bid form.

12. Please verify quantity for Bid item 14. The Bid schedule has 11,410LF and there appears to only be 7,200LF.
    a. Contingency and cable slack factors are included.

13. Please verify quantity for Bid item 21. The Bid schedule has 22790LF and there appears to only be 17,200LF (including the highlighted potential 4w2" duct on sheet L1)
    a. Contingency and cable slack factors are included.

14. Please verify quantity for Bid item 32. The Bid schedule has 5495LF and there appears to only be 4500LF.
    a. Contingency and cable slack factors are included.

ADDENDUM NO. 1 ISSUED BY:

H.W. Lochner, Inc.

Chris A. Whitfield, P.E.
Project Manager

TBPE Firm Registration No. 10488

CAW/
Enclosures

pc: 18596

ITEM L-101

AIRPORT ROTATING BEACONS

DESCRIPTION

101-1.1 This item shall consist of furnishing and installing new airport rotating beacons. The work shall include mounting, leveling, wiring, painting, maintaining, and testing of the beacon. In addition, this item also includes all materials and incidentals necessary to place the beacon in a serviceable condition (as a completed unit) to the satisfaction of the RPR. This item shall include a mounting platform if specified in the plans.

EQUIPMENT AND MATERIALS

101-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (ACs) 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 RPR.

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

d. All materials and equipment used to construct this item shall be submitted to the RPR 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 mark each copy to identify the products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components or 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 accrue directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the Contract Documents plans and specifications. The Contractor's submittals shall be **neatly bound in a properly sized 3-ring binder in an electronic pdf file format,** tabbed by specification section. The RPR 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 in 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.

101-2.2 Beacon. The beacon shall be a Type **L-801 Class A** beacon meeting the requirements of AC 150/5345-12, Specification for Airport and Heliport Beacons.

101-2.3 Beacon installation. Installation shall be as shown on the plans. Provide two lamp sets as spares.

101-2.4 Panel boards and breakers. Panel boards and breakers shall conform to the requirements of Federal Specification W-P-115, Panel, Power Distribution.

101-2.5 Weatherproof cabinets. The weatherproof cabinets shall conform to National Electrical Manufacturers Association Standards (NEMA) and shall be constructed of steel not less than No. 16 United States Standard (USS) gauge.

101-2.6 Electrical wire. 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 the type, size, number of conductors, and voltage shown in the plans or in the proposal.

101-2.7 Conduit. Rigid steel conduit and fittings shall be per Underwriters Laboratories Standards 6, 514B, and 1242.

101-2.8 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. Priming paint for galvanized metal surfaces shall be a zinc-rich epoxy primer paint per MIL-DTL-24441/19C, Formula 159, Type III. Use MIL-24441 thinner per paint manufacturer's recommendations.

c. Orange paint for the body and the finish coats on metal and wood surfaces shall consist of a ready-mixed non-fading paint meeting the requirements of Master Painter's Institute (MPI) Reference #9 (gloss). The color shall be per Federal Standard 595, International Orange Number 12197.

d. White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint per the Master Painter's Institute, Reference #9, Exterior Alkyd, Gloss, volatile organic content (VOC) Range E2.

e. Priming paint for wood surfaces shall be mixed on the job by thinning the above-specified orange or white paint with 1/2 pint (0.24 liter (l)) of raw linseed oil to each gallon (liter).

CONSTRUCTION METHODS

101-3.1. Placing the beacon. The beacon shall be mounted as shown in the plans.

101-3.2 Hoisting and mounting. The beacon shall be hoisted to the mounting platform by using suitable slings and hoisting tackle. Before fastening the beacon to the mounting platform, the mounting holes shall be checked for correct spacing. Beacon base or mounting legs shall not be strained or forced out of position to fit incorrect spacing of mounting holes. The beacon base shall be raised first, set in position, and bolted in place. The drum shall then be raised and assembled to the base.

101-3.3 Leveling. After the beacon has been mounted, it shall be accurately leveled following the manufacturer's instructions. The leveling shall be checked in the presence of the RPR and shall be to the RPR's satisfaction.

101-3.4 Servicing. Before placing the beacon in operation, the Contractor shall check the manufacturer's manual for proper servicing requirements. Follow the manufacturer's servicing instructions for each size of beacon.

101-3.5 Beam adjustment. After the beacon has been mounted and leveled, the elevation of the beam shall be adjusted. The final beam adjustments shall be made at night so that results can be readily observed. The beams shall be adjusted to the elevation directed by the RPR or as shown in the plans. See AC 150/5340-30 for additional information about airport beacon beam adjustment.

101-3.6 Beacon mounting platform. Where the beacon is to be mounted at a location other than the beacon tower and where a special mounting platform is required, the construction of the mounting platform and any necessary lightning protection equipment shall be per the details shown in the plans.

101-3.7 Wiring. The Contractor shall furnish all necessary labor and materials and shall make complete above ground electrical connections per the wiring diagram furnished with the project plans. The electrical installation shall conform to the requirements of the latest edition of National Fire Protection Association, NFPA-70, National Electrical Code (NEC).

If underground cable for the power feed from the transformer vault to the beacon site and duct for this cable installation is required, the cable, ground rods and duct shall be installed as shown on the plans.

If shown on the plans, the Contractor shall connect the tell-tale relay mechanism in the beacon to energize the tower obstruction light circuit when failure of the beacon service (primary) lamp occurs.

If lightning protection is specified in the plans, it shall be installed per Item L-103, Airport Beacon Towers, paragraph 103-2.3.

101-3.8 Panel and cabinet. If shown on the plans, the Contractor shall furnish and install at the top of the beacon tower or mounting platform a circuit-breaker panel consisting of four 15-ampere breakers mounted in a weather-proof cabinet to provide separate protection for the circuits to the beacon lamps, motor, obstruction lights, and other equipment. The cabinet shall be located on the side of the beacon platform as shown on the plans or as directed by the RPR.

101-3.9 Conduit. All exposed wiring shall be run in not less than 3/4 inch (19 mm) galvanized rigid steel conduit. Outdoor rated, liquid-tight, flexible metal conduit may be used for final connection at the beacon equipment. No conduit shall be installed on top of a beacon platform floor. All conduits shall be installed to provide for drainage. If mounted on a steel beacon tower, the conduit shall be fastened to the tower members with Wraplock® straps (or equivalent), clamps, or approved fasteners, spaced approximately 5 feet (1.5 m) apart. The conduit shall be fastened to wooden structures with galvanized pipe straps and with galvanized wood screws not less than No. 8 or less than 1-1/4 inches (32 mm) long. There shall be at least two fastenings for each 10 feet (3 m) length.

101-3.10 Booster transformer. The installation shall be as indicated in the plans and described in the specifications.

101-3.11 Photoelectric control. If shown in the plans or specified in the job specifications, the Contractor shall furnish and install an automatic control switch at the location indicated in the plans. The switch shall be a photoelectric type. It shall be a standard commercially available unit that will energize when the illumination on a vertical surface facing North decreases to 25 to 35 foot-candles (269 to 377 lux). The photoelectric switch should de-energize when the illumination rises to 50 to 60 foot-candles (538 to 646 lux). The photoelectronic switch shall be installed, connected, and adjusted per the manufacturer's instructions.

101-3.12 Obstruction lights. Unless otherwise specified, the Contractor shall install on the top of the beacon tower or mounting platform two L-810 obstruction lights on opposite corners. These lights shall be mounted on conduit extensions to a height of not less than 4 inches (100 mm) above the top of the beacon.

101-3.13 Painting. If construction of a wooden mounting platform is stipulated in the proposal as part of this item, all wooden parts of the platform shall be given one priming coat of white or aviation-orange paint after fabrication but before erection and one body and one finish coat of international-orange paint after erection. Steel mounting platforms shall be given one priming coat of corrosion-inhibiting primer before erection and one body and one finish coat of international-orange paint after erection. All equipment installed under this contract and exposed to the weather shall be given one body and one finish coat of international-orange (per Federal Standard 595, Number 12197) or white paint as required. This

shall include the beacon (except glass surfaces), beacon base, breaker cabinet, all conduit, and transformer cases. It shall not include lightning protection system air terminals or obstruction light globes.

Apply the paint uniformly at the proper consistency. The finished paint shall be free from sags, holidays, and smears. Each coat of paint shall be given ample time to dry and harden before the next coat of paint is applied. A minimum of three (3) days shall be allowed for drying on wood surfaces, and a minimum of four (4) days shall be allowed for drying on metal surfaces. Painting shall not be performed in cold, damp, foggy, dusty, or frosty atmospheres, or when the air temperature is below 40°F (4°C), nor started when the weather forecast indicates such conditions for the day.

All surfaces shall be cleaned before painting. The surfaces shall be dry and free from scale, grease, rust, dust, and dirt. All knots in wood surfaces shall be covered with shellac immediately before applying the priming coat of paint. Nail holes and permissible imperfections shall be filled with putty. The ready-mixed paint shall be thinned for the priming and body coats per the manufacturer's recommendations. In the absence of such recommendations, the following shall apply:

a. Body coats (for both wood and steel surfaces) - add 1/2 pint (0.24 liter) of turpentine to each gallon (liter) of ready-mixed paint for body coats.

b. Finish coats (for both wood and steel surfaces) the ready-mixed paint shall be used as it comes from the container for finish coats.

101-3.14 Testing. The beacon installation shall be fully tested as a completed unit prior to acceptance. These tests shall include operation of the lamp-changer and performing insulation resistance and voltage readings. The insulation resistance to ground of the beacon power supply circuit shall be not less than 100 megohms when measured ungrounded. The Contractor must furnish testing equipment. Tests shall be conducted in the presence of the RPR and shall be to the RPR's satisfaction.

METHOD OF MEASUREMENT

101-4.1 The quantity to be paid for shall be the number of beacons installed as completed units in place, accepted, and ready for operation.

BASIS OF PAYMENT

101-5.1 Payment will be made at the contract unit price for each completed and accepted job. This price shall be full compensation for **removal of existing beacon** furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item L-101-1	**Install L-801A (L) Rotating Beacon with Rotating Beacon Tower - per each**
Item L-101-2	**Install L-801A (L) Rotating Beacon with Rotating Beacon on Existing Tower -per each**

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 150/5345-7	Specification for L-824 Underground Cable for Airport Lighting Circuits
AC 150/5345-12	Specification for Airport and Heliport Beacons
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program
AC 150/5390-2	Heliport Design

Commercial Item Description

A-A-59544A	Cable and Wire, Electrical (Power, Fixed Installation)

Federal Specification (FED SPEC)

FED SPEC W-P-115	Panel, Power Distribution

Federal Standard (FED STD)

FED STD 595	Colors Used in Government Procurement

Master Painter Institute (MPI)

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

Mil Spec

MIL-DTL-24441C/19C	Paint, Epoxy-Polyamide, Zinc Primer, Formula 159, Type III

National Fire Protection Association (NFPA)

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

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit – Steel
UL Standard 514B	Conduit, Tubing, and Cable Fittings
UL Standard 1242	Electrical Intermediate Metal Conduit - Steel

END OF ITEM L-101

ITEM L-105

ALTERATIONS, REMOVAL AND DEMOLITION

GENERAL

105-1.1 DEFINITIONS. Alterations shall mean any change or rearrangement in the component parts, including structural, mechanical, electrical systems, or internal or external arrangements of an existing structure.

Removal shall mean the dismantling of existing materials, components, equipment, and utilities. Removed items shall be handled, prepared for storage, transported to storage areas as specified.

Demolition shall mean the dismantling and disposal of existing materials, components, equipment, and utilities which cannot or will not be reused or which will have no salvage value, or which cannot be reused due to unrepairable damage caused by age, non-demolition related reasons, etc. All demolished items not designated to be turned over to the Owner shall be disposed of in a safe manner and at a location acceptable to the Owner.

All items to be turned over to the Owner shall be properly enclosed or boxed to protect the items from damage and transported by the Contractor to a location on the Owner's property, designated by the Engineer and/or the Owner.

The installation and/or removal of lighting equipment may be critical to airport operations; therefore, the Contractor shall follow the work schedule established in the plans and specifications or as directed by the Engineer. The system shall be installed in accordance with the National Electrical Code and/or local code requirements.

The Contractor shall provide temporary wiring as required to reconnect existing circuits to provide guidance for aircraft to pass through the construction areas on those taxiways/runways which must remain open. The Contractor shall check all temporary circuits before dark each day to assure that they are operational. In the event of failure, the Contractor shall immediately take steps to restore operation. The cost of temporary and reconnected lighting shall be absorbed in the various work items.

105-1.2 CONDITION OF EXISTING FACILITIES. The Contractor shall verify the areas, conditions, and features necessary to tie into existing construction. This verification shall be done prior to submittal of shop drawings, fabrication or erection, construction, or installation. The Contractor shall be responsible for the accurate tie-in of the new work to existing facilities.

Special attention is called to the fact that there may be piping, fixtures or other items in the existing systems which must be removed or relocated in order to perform the alteration work. All conduit, wiring, boxes, etc., that do not comply with these specifications shall be removed or corrected to comply with these specifications. All unused conduit not removed shall be identified and a pull line shall be installed. The work shall include all removal and relocation required for completion of the alterations and the new construction.

Whenever the scope of work requires connection to an existing circuit, the circuit's insulation resistance shall be tested, in the presence of the Owner and Engineer. The Contractor shall record the results on the forms included in these specifications. When the circuit is returned to its final condition, the circuit's insulation resistance shall be checked again in the presence of the Owner and Engineer. The Contractor shall record the results on the forms included in these specifications. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance Manuals as described in Item L-106, Submittals, Record Documents and Maintenance Manuals.

105-1.3 OCCUPANCY AND USE OF EXISTING FACILITIES. The Owner will occupy and use the facilities within the areas of work during the entire construction period. The Contractor shall be required to plan and coordinate his activities in order to provide all necessary controls for the abatement of dust, noise, and inconvenience to the Owner personnel during all phases of the work.

105-1.4 VACATING OCCUPIED AREAS. The Owner will remove all portable items of furniture, equipment, and fixtures prior to the start of work.

105-1.5 SAFETY REQUIREMENTS. The Contractor shall conduct alterations and removal operations in a manner that will ensure the safety of persons in accordance with the requirements of CFR 29 PART 1926 and 1910.

105-1.6 CLASSIFICATION OF REMOVED/DEMOLISHED ITEMS. Existing materials and equipment indicated to be removed will be classified as "salvageable" and shall remain the property of the Owner or will be classified as "debris" and shall be disposed of legally off the airport.

1.1 Reusable salvaged items:

1. Salvaged materials and equipment shall be reused in the work as described on the contract drawings, unless noted otherwise.
2. Items classified as debris shall be legally disposed of off the airport property. The cost of such disposal shall be included in the cost of other items of work.

1.2 Retained salvaged items:

1. Salvaged materials and equipment to be retained by the Owner but not reused in the work shall be turned over to the Owner at a site at the facility to be determined by the Owner. Retained salvaged items shall be stored on Owner property where indicated by the Owner.

105-1.7 TEMPORARY PROTECTION. The Contractor shall provide and maintain the following requirements.

Protection of persons and property shall be provided throughout the progress of the work in accordance with these specifications.

Provide temporary enclosures and partitions prior to starting alterations and removal of work. Such items shall protect existing materials, equipment, and other remaining building or system components from damage by weather and construction operations.

Provide temporary enclosures to isolate space utilized by equipment during construction, from dirt, dust, noise, and unauthorized entry.

Provide temporary exits, entrances, and protected passages where work prevents the use of existing facilities.

Provide weathertight temporary enclosures over and around openings to be made in existing exterior construction prior to the start of work. The Contractor shall maintain such temporary enclosures until new construction will protect the interior of existing facilities from the elements.

Provide temporary exterior wall construction which will be designed and fabricated to resist an applied horizontal wind pressure of not less than 130 mph.

Provide temporary exterior roof construction which will be capable of supporting an applied vertical live load of not less than 200 psf, uniformly distributed over the entire roof area.

Design and fabricate temporary enclosures to maintain temperatures inside the existing facilities within a range of plus-or-minus 5 degrees F of normal operating conditions.

Provide temporary jet blast structures which will withstand the jet blast with a safety factor of 2.

EXECUTION

105-2.1 DISCONNECTING UTILITIES. Prior to the start of work, the necessary utilities serving each area of alteration or removal will be shut off by the Owner and shall be disconnected and sealed by the Contractor, as required. Lockout/Tag/Try procedures shall be utilized in accordance with Item L-105A Recommended Lockout Procedures for Airfield Lighting Circuits.

105-2.2 TEMPORARY UTILITY SERVICES. The Contractor shall install temporary utility services in satisfactory operating condition before disconnecting existing utilities. Such temporary services shall be maintained during the period of construction and removed only after new permanent services have been tested and are in operation.

105-2.3 REMOVAL WORK. The Contractor shall not disturb the existing construction beyond that indicated or necessary for installation of new work. Temporary shoring and bracing for support of building components to prevent settlement or other movement shall be as indicated and as required to protect the work.

The Contractor shall provide protective measures to control accumulation and migration of dust and dirt in all areas of work, particularly those adjacent to occupied areas. The Contractor shall remove dust, dirt, and debris from the areas of work daily.

105-2.4 SALVAGEABLE MATERIALS AND EQUIPMENT. The Contractor shall remove all salvageable materials and equipment in a manner that will cause the least possible damage thereto. The equipment shall be properly supported during the removal operation to prevent damage. Removed items which are to be retained by the Owner shall be carefully handled, stored, and protected.

The Contractor shall provide identification tags on all items boxed or placed in containers, indicating the type, size, and quantity of materials.

105-2.5 BUILDINGS AND STRUCTURES. The Contractor shall perform removal operations in existing buildings as indicated and as otherwise required to complete the work.

Existing concrete shall be demolished, removed, and disposed of. Square, straight edges shall be provided where existing concrete adjoins new work and at other locations where indicated. Existing steel reinforcement shall be protected where indicated; otherwise, it shall be cut off flush with face of concrete.

The Contractor shall dismantle steel components at field connections and in a manner that will prevent bending or damage.

The use of flame-cutting torches will be permitted only when other methods of dismantling are not practical, and when approved in writing by the Owner and/or Engineer.

105-2.6 ELECTRICAL EQUIPMENT AND FIXTURES. Wiring systems and components shall be salvaged. Loose items shall be boxed and tagged for identification.

All unused conduit not removed shall have a pull string installed and shall be noted on the record drawings.

Primary, secondary, control, communication, and signal circuits shall be disconnected at the point of attachment to their distribution system.

The Contractor shall remove and salvage electrical fixtures. Incandescent lamps, mercury-vapor lamps, and fluorescent lamps shall be salvaged, boxed and tagged for identification, and protected from breakage.

The Contractor shall remove and salvage switches, receptacles, fixtures, transformers, constant current regulators, meters, instruments, plates, circuit breakers, panelboards, outlet boxes, and similar items. These items shall be boxed and tagged for identification according to type and size.

The Contractor shall remove and dispose of conductors and conduits not used in the finished work and shown to be demolished on the plans.

DEMOLITION

105-3.1 DEMOLITION OPERATIONS. Demolition operations shall be conducted to ensure the safe passage of persons to and from facilities occupied and used by the Owner and to prevent damage by falling debris or other cause to adjacent buildings, structures, and other facilities.

The sequence of operations shall be such that maximum protection from inclement weather will be provided for materials and equipment located in partially dismantled structures.

105-3.2 MAINTAINING TRAFFIC. Demolition operations and removal of debris to disposal areas shall be conducted to ensure minimum interference with runways, taxiways, aprons, roads, streets, walks, and other facilities occupied and used by the Owner.

Streets, walks, runways, taxiways, and other facilities occupied and used by the Owner shall not be closed or obstructed without written permission from the Owner.

105-3.3 REFERENCE STANDARDS REQUIREMENTS. Demolition operations shall be conducted to ensure the safety of persons in accordance with ANSI A 10.6 Safety Requirements for Demolition.

Demolition shall be conducted in accordance with OSHA, State, and local requirements.

DISPOSAL OF DEMOLISHED MATERIALS

105-4.1 GENERAL. The Contractor shall dispose of debris, rubbish, scrap, and other non-salvageable materials resulting from demolition operations. Demolished materials shall not be stored or disposed of on Airport property.

105-4.2 REMOVAL FROM OWNER PROPERTY. Materials classified as debris shall be transported from Owner property and legally disposed of at no additional cost to the Owner. Permits and fees for disposal shall be paid by the Contractor.

ALTERATION WORK

105-5.1 GENERAL. Cutting, patching, repairing, and other alteration work shall be done by tradesman skilled in the particular trade or work required.

Where required to patch or extend existing construction, or both, such alteration work shall match existing exposed surface materials in finish, color, texture, and pattern.

Salvaged items for reuse shall be as approved by the Engineer and Owner.

METHOD OF MEASUREMENT

105-6.1 For the PAPI removal including Foundation and 600V cables, this item includes all materials, labor, transportation incidentals and services required for the airfield complete removal of the PAPI system as shown on the plans. This item includes all light units, power and control units, associated foundations, exposed conduit or other exposed equipment including equipment racks, disconnects, grounding, load centers, etc, as well as associated cables and conduits that are no longer used as a result of this project. It is the intent of this demolition pay item that all materials and associated cables noted for demolition shall be removed in its entirety. Demolition of conduit or direct buried cables is limited to areas requiring excavation for construction of pavement or new utilities or associated infrastructure. It is not the intent of this item to provide additional excavation for the sole purpose of electrical infrastructure removal. Incidental to this item are all associated duct markers, ground rods as well as repair of the disturbed area to match surrounds including sodding. Where a conductor is no longer in use but cannot be demolished, the cable ends shall be tagged and labeled at each end and at all accessible areas of the cable. For 600V cables, measurement is for the complete circuit including all conductors.

105-6.2 For the primary windcone removal including Foundation and 600V cables, this item includes all materials, labor, transportation incidentals and services required for the airfield complete removal of the primary windcone system as shown on the plans. This item includes mast, power and control units, associated foundations, exposed conduit or other exposed equipment including equipment racks, disconnects, grounding, load centers, etc, as well as associated cables and conduits that are no longer used as a result of this project. It is the intent of this demolition pay item that all materials and associated cables noted for demolition shall be removed in its entirety. Demolition of conduit or direct buried cables is limited to areas requiring excavation for construction of pavement or new utilities or associated infrastructure. It is not the intent of this item to provide additional excavation for the sole purpose of electrical infrastructure removal. Incidental to this item are all associated duct markers, ground rods as well as repair of the disturbed area to match surrounds including sodding. Where a conductor is no longer in use but cannot be demolished, the cable ends shall be tagged and labeled at each end and at all accessible areas of the cable. For 600V cables, measurement is for the complete circuit including all conductors.

BASIS OF PAYMENT

105-7.1 Payment will be made at the contract price for the required airfield nav-aid **or visual aid** demolition. This price shall be full compensation for furnishing all material, equipment and for all preparation, removal of the salvageable materials or debris and equipment and for all labor, equipment, tools and incidentals necessary to complete this item. This item includes any temporary wiring, fixtures, etc. required to maintain the existing airfield **navigational or** lighting systems to the satisfaction of the Owner and Engineer. Separate payment will be made for each Nav-Aid **or Visual-Aid** type.

Payment will be made under:

Item L-105-1	**Remove & Dispose Elevated Runway Edge Light, Stake Mount**	**– per each**
Item L-105-2	**Remove and Dispose Airfield Sign, Stake Mount**	**– per each**
Item L-105-3	**Remove and Dispose Rotating Beacon Tower and Foundation**	**– per each**
Item L-105-4	**Remove & Dispose PAPI-2 Unit Including Foundation and Conductors**	**– per each**
Item L-105-5	**Remove & Dispose Primary Wind Cone Including Foundation and Conductors**	**– per each**

END OF ITEM L-105

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ITEM L-110

AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

EQUIPMENT AND MATERIALS

110-2.1 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 RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR 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 RPR 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 non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for 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 project that accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be **electronically submitted in pdf format, tabbed by specification section.** The RPR 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 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.

110-2.2 Steel conduit. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10-mil thick coat of asphaltum sealer or shall have a factory-bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mils of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions. In lieu of PVC coated RGS, corrosion wrap tape shall be permitted to be used where RGS is in contact with direct earth."

110-2.3 Plastic conduit. Plastic conduit and fittings-shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

a. Type I–Schedule 40 and Schedule 80 PVC suitable for underground use either direct-buried or encased in concrete.

b. Type II–Schedule 40 PVC suitable for either above ground or underground use.

c. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.

d. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 Split conduit. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 Conduit spacers. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high-grade, high-density polyethylene complete with interlocking cap and base pads. They shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 Concrete. Concrete shall be proportioned, placed, and cured per ~~Item P-610, Concrete for Miscellaneous Structures~~ TxDOT 421, Type C, Hydraulic Cement Concrete.

110-2.7 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

110-2.8 Flowable backfill. Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

110-2.9 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with

continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

110-3.1 General. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The RPR shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches (50 mm) inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. Under pavement, the top of the duct bank shall not be less than 18 inches (0.5 m) below the subgrade; in other locations, the top of the duct bank or underground conduit shall be not less than 18 inches (0.5 m) below finished grade.

The Contractor shall mandrel each individual conduit whether the conduit is direct-buried or part of a duct bank. An iron-shod mandrel, not more than 1/4 inch (6 mm) smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, 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 recleaned at the Contractor's expense. All accessible points shall be kept closed when not installing cable. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

For pulling the permanent wiring, each individual conduit, whether the conduit is direct-buried or part of a duct bank, shall be provided with a 200-pound (90 kg) test polypropylene pull rope. The ends shall be secured and sufficient length shall be left in access points to prevent it from slipping back into the conduit. Where spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose.

All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet (1.5 m).

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required conduit or duct bank 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 (6.3 mm) sieve. Flowable backfill may alternatively be used

Underground electrical warning (Caution) tape shall be installed in the trench above all underground duct banks and conduits in unpaved areas. Contractor shall submit a sample of the proposed warning tape for approval by the RPR. If not shown on the plans, the warning tape shall be located 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer's recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet (60 cm).

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the RPR, the unsuitable material shall be removed per Item P-152 and replaced with suitable material. Additional duct bank supports shall be installed, as approved by the RPR.

All excavation shall be unclassified and shall be considered incidental to Item L-110. Dewatering necessary for duct installation, and erosion per federal, state, and local requirements is incidental to Item L-110.

Unless otherwise specified, excavated materials that are deemed by the RPR to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

Any excess excavation shall be filled with suitable material approved by the RPR and compacted per Item P-152.

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:

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

b. Trenching, etc., in cable areas shall then proceed with approval of the RPR, 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.

110-3.2 Duct banks. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches (0.5 m) below the bottom of the base or stabilized base course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches (0.5 m) below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet (1 m) beyond the edges of the pavement or 3 feet (1 m) beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches (75 mm) thick prior to its initial set. The Contractor shall space the conduits not less than 3 inches (75 mm) apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches (75 mm) thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

When specified, the Contractor shall reinforce the bottom side and top of encasements with steel reinforcing mesh or fabric or other approved metal reinforcement. When directed, the Contractor shall supply additional supports where the ground is soft and boggy, where ducts cross under roadways, or where shown on the plans. Under such conditions, the complete duct structure shall be supported on reinforced concrete footings, piers, or piles located at approximately 5-foot (1.5-m) intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches (75 to 150 mm) wide tape, 8 inches (200 mm) minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch (75-mm) wide tape only for single conduit runs. Utilize the 6-inch (150-mm) wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches (600 mm) in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the RPR shall be notified so that he may inspect the cable and determine that it is in good condition. Where required, split duct shall be installed as shown on the drawings or as required by the RPR.

110-3.3 Conduits without concrete encasement. Trenches for single-conduit lines shall be not less than 6 inches (150 mm) nor more than 12 inches (300 mm) wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the conduit along its entire length.

Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches (100 mm) thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding material shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch (6.3 mm) sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches (0.5 m) below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches (60 cm) below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches (150 mm) apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and lot less than 6 inches (150 mm) apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth while backfilling. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word "DUCT" or "CONDUIT" on each marker slab. Impression of letters shall be done in a manner, approved by the RPR, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility orange paint, as approved by the RPR. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the RPR. The letters shall be 4 inches (100 mm) high and 3 inches (75 mm) wide with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 Backfilling for conduits. For conduits, 8 inches (200 mm) of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.6 Backfilling for duct banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 "Excavation and Embankment" except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet (76 m) of duct bank or one work period's construction, whichever is less.

Flowable backfill may alternatively be used.

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, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.7 Restoration. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to its original condition. The restoration shall include **sodding, seeding, mulching** shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

110-3.8 Ownership of removed cable.

METHOD OF MEASUREMENT

110-4.1 Underground conduits and duct banks shall be measured by the linear feet (meter) of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and restoration, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for removal and disposal of existing duct banks and conduits as shown on the plans, furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

Payment will be made under:

Item L-110-1 1-Way, 2" PVC Conduit, Sched 40 - per linear foot

Item L-110-2 4-Way, 2" PVC Conduit, Sched 40, Encased in Earth - per linear foot
Item L-110-3 Bore 4 - 2" HDPE Conduit under existing paving - per linear foot
Item L-110-4 Bore 2 - 2" HDPE Conduit under existing paving - 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 Circular (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

ASTM International (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

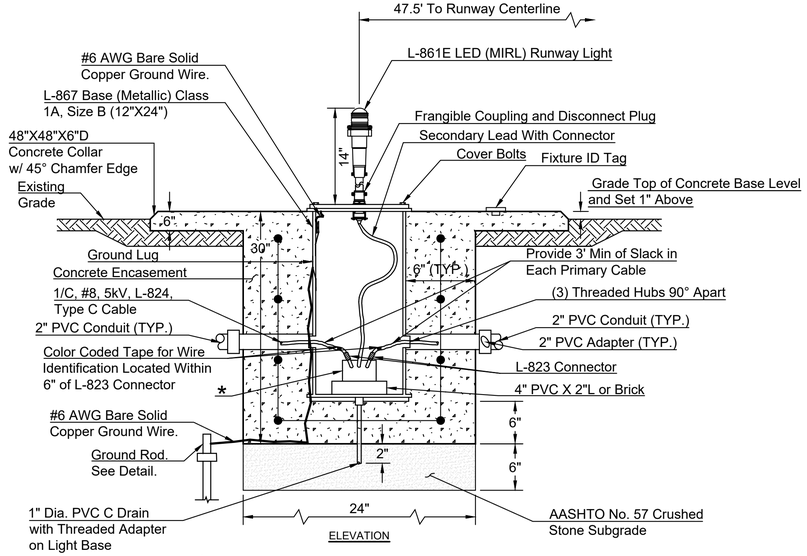
National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

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 1242	Electrical Intermediate Metal Conduit Steel
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

END OF ITEM L-110



ELEVATION

* L-830 Transformer, Size as Required to Serve Fixture

TYPICAL BASE CAN MOUNTED EDGE LIGHT (UNPAVED AREAS)

No Scale

TYPICAL L-867 JUNCTION BOX

No Scale

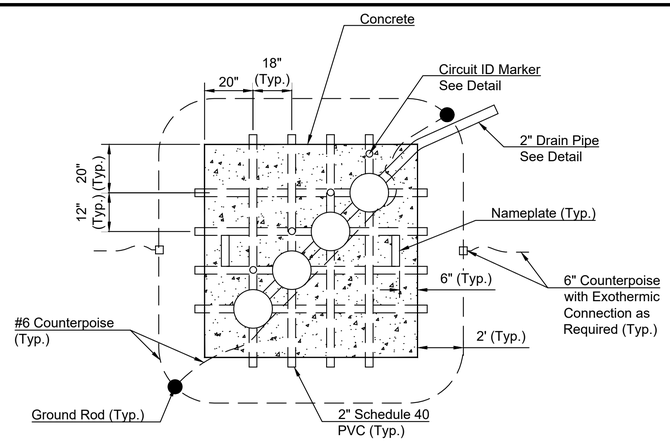
JUNCTION CAN ID MARKER

No Scale

Notes:

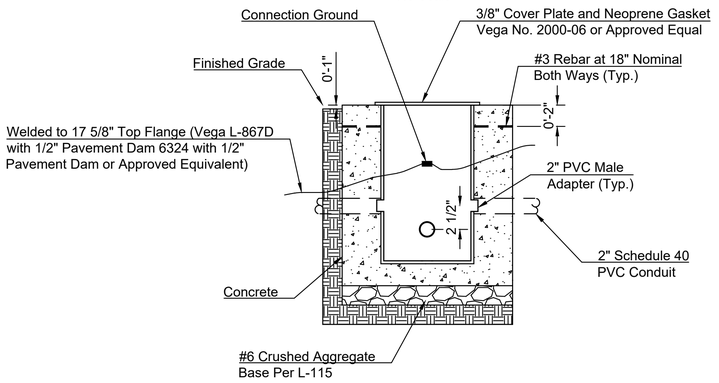
1. Identification shall be stamped using 1/4" figures and letter uniformly spaced on the bronze marker. Marked RJ1 through RJ7.

2. Identification markers shall be uniformly installed adjacent to taxiway and runway elevated edge lights. Preferred location is on a line perpendicular to taxiway and runway centerline, inboard of light fixture.



4-WAY JUNCTION CAN PLAZA

No Scale

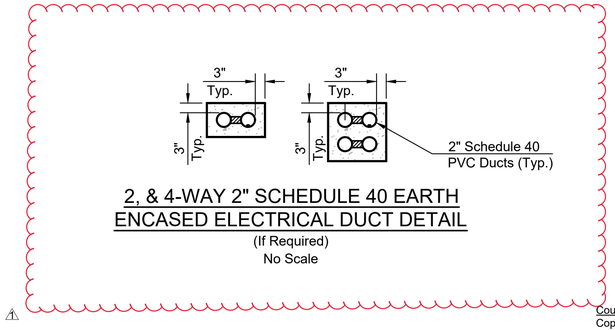


SECTION DETAIL

No Scale

Note:

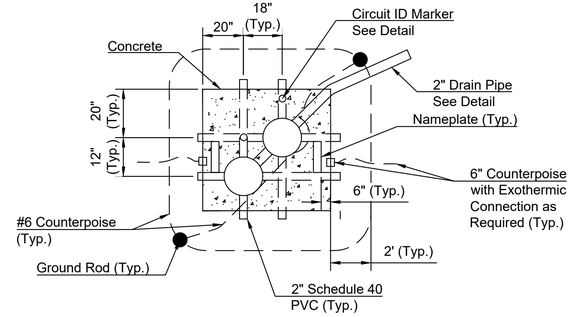
Each Junction Can has 4 hubs. Hubs shall be placed in 2 layers and the hubs in one layer shall be 90 degrees from the hubs in the other layer. Each pair of hubs shall be 180 degrees apart



2, & 4-WAY 2" SCHEDULE 40 EARTH ENCASED ELECTRICAL DUCT DETAIL

(If Required)

No Scale



2-WAY JUNCTION CAN PLAZA

No Scale

Junction Can Plaza Notes:

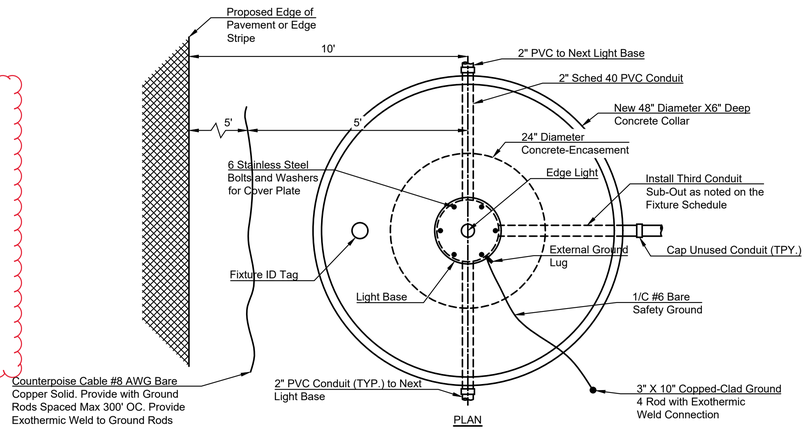
1. Conduits which are not used in the project shall be sand encased and capped 60" outside of the plaza concrete.

2. Contractors shall provide a 2" DIA. domed bronze ID marker at each junction can as shown. Marker shall be stamped with unique identifier and associated CKT ID as shown on plans. Refer to detail on this sheet.

3. Install ground rods and ground loop at all junction can plazas as shown. Two ground rods per plaza located at opposite corners shall be provided. Counterpoise shall be located nominally 12" below existing grade.

4. Contractor shall label 2 ends of each junction can plaza (JCP) by impressing the JCP identification number into the concrete foundation. During placement letters and numbers shall be 4" in height, proportional in width and have a stroke width of 1/2" and 1/4" depth.

5. All junction cans are L-867 Type D and include four threaded hubs at 90° on center around can with hubs at 0° and 180° at 2.5" from bottom and hubs at 90° and 270° at 5" from bottom. Refer to detail on this sheet.



PLAN

TYPICAL BASE CAN MOUNTED EDGE LIGHT (UNPAVED AREAS)

No Scale

ROBERT C. JUTTON
#43404
REGISTERED
PROFESSIONAL
ENGINEER
STATE OF TEXAS
09/28/2022

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TBPE Firm Registration No. 10488

CITY OF COMANCHE, TEXAS

COMANCHE COUNTY-CITY AIRPORT
COMANCHE, TEXAS

PROJECT NO.	000018596
DRAWN BY / DATE	KRG 09/28/2022
CHECKED BY / DATE	CAW 09/28/2022
DESIGNED BY / DATE	KRG 09/28/2022
REVISIONS / DATE	
100% SUBMITTAL	07/07/2022
FINAL REVIEW	08/16/2022
SEALED SET	09/28/2022
ADDENDUM NO. 1	11/07/2022

ELECTRICAL DETAILS

E5

LOCHNER

COMANCHE COUNTY-CITY AIRPORT (MKN)

TxDOT CSJ No. 2223COMAN
Lochner Project No. 18596

PRE-BID MEETING MINUTES
Thursday, November 3, 2022; 10:00 a.m.

I. Sign In Sheet:

II. Identify Key Personnel:

- Robert Cobb, Airport Board
- Paul Slusser, TxDOT Aviation Division
- Chris Whitfield, H.W. Lochner

II. Bidding Procedure:

A. Receipt and Opening of Bids:

1. Proposals will be received until **2:00 pm CST on Wednesday, November 16, 2022.**

   Sealed bids for the construction of airport improvements at Comanche County-City Airport need to be addressed and delivered to the Airport Board, Robert Cobb, Comanche City Hall 101 E Grand Ave, Comanche, TX 76442. Bids will be received until 2:00 p.m., November 16, 2022, then publicly opened and read. Any bid received after closing time will be returned unopened.

   Then and publicly opened and read. Any bid received after closing time will be returned unopened.

2. Bidding documents may be examined at: H.W. Lochner, 12750 Merit Drive, Suite 570, Dallas, Texas 75251

3. Envelopes containing bids must be sealed and addressed as shown in the Instructions To Bidders of the Contract Documents/Specifications.

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

5. The deadline for any questions is **noon November 7th.**

B. Contract Provisions and Proposal Form:

1. Mandatory contract provisions are identified in General Provisions and Supplementary Provisions of the Contract Documents. **The DBE goal for this project is 7% and the bidders shall use the attached DBE participation plan and appropriate commitment agreement forms and submit those documents to TxDOT Aviation within 5 calendar days after the bid opening via email to AVRNFQ@txdot.gov.**

2. Proposers shall provide a statement of qualifications with their proposal of past similar work, a financial statement, and a statement of plant and equipment proposed for use on the project. In

lieu of the financial statement, Contractors may provide evidence that they are pre-qualified with TXDOT for similar work and are on the current TXDOT bidders list.

3. The Contractor and his/her Subcontractors will be required to provide certificates of insurance for at least the minimum amounts specified in the Special Provisions.

4. Bidder shall reference the Aviation Division General Construction Contract Provisions. http://txdot.gov/inside-txdot/division/aviation/general-provisions.html

5. The bidder shall submit the completed bid either on the form furnished by TxDOT or by submitting an electronically printed version. All blank spaces in the TxDOT bid form must be correctly filled in were indicated for each and every item for which quantity is given. The bidder shall state the price both in words and numerals for each pay item furnished in the bid.

6. A Bid Bond guarantee will be required with each bid as a certified check or a bid bond in the amount of two (2) percent of the total amount of the bid, made payable to the TxDOT Aviation.

III. Scope of Work:

A. The project consists of:

- **Comanche County - City Airport**
  Replace the Medium Intensity Runway Lights (MIRL); Replace Runway Guidance Signs; Replace PAPI-2 Units; Replace Lighted Wind Cone; Replace Rotating Beacon and Tower; Install Electric Vault and Equipment; and Grade Runway Shoulders

B. The contract period for construction is **one hundred and eight (180)** calendar days from the commencement date specified in the Notice-to-Proceed. The initial 90 days of construction shall be for mobilization and equipment procurement. The Airport will remain open during this time. The 90-day period may be removed from the schedule if the Contractor does not need the mobilization and equipment procurement time. **Liquidated damages are set at $1200.00 per calendar day**. Delays due to weather and other factors out of the control of the Contractor that are above and beyond a typical season may be requested in writing as a reason for contract period extension.

IV. Site Access/Staging Area:

A. Contractor's access roads, haul roads, and staging areas are shown on sheet 4 of the Plans.

V. Safety and Phasing Plan:

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

B. Lochner will provide Construction Observation throughout the project. The Contractor shall provide all testing as outlined in the Contract Documents / Specifications.

VI. Questions:

A. Can we write in the values on the bid form?
   i. No, you must fill the unit prices out electronically, print the form and then sign.

COMANCHE COUNTY-CITY AIRPORT (MKN)
COUNTY OF COMANCHE & CITY OF COMANCHE, TEXAS

LOCHNER

Airfield Electrical Improvement Project

CSJ NO. 2223COMAN

Pre-Bid Meeting
Comanche County-City Airport
Thursday, November 3, 2022; 10:00 a.m

	Name	Company	Email	Telephone	Present	Call-In
1.	*Paul Slusser*	*TxDOT Aviation*	Paul.Slusser@txdot.gov	*(512) 416-4527*		
2.	*Dawn Denson*	*TxDOT Aviation*	Dawn.Denson@txdot.gov	*(512) 416-4526*		
3.	*Eli Lopez*	*TxDOT Aviation*	eli.lopez@txdot.gov	*(512) 416-4506*	✓	
4.	*Robert Cobb*	*Comanche Airport*	savesave@verizon.net	*(325) 356-3354*		
5.	*Gary Easley*	*Comanche Airport*	gary_easley@hotmail.com	*(254) 842-8701*		
6.	*Darwin Dickerson*	*City of Comanche*	ddickerson@ci.comanche.tx.us	*(254) 842-9706*	D.K.D	
7.	*Lecette Ferguson*	*Ferguson*	lferguson@fci-engr.com	*(281) 252-9232*		
8.	*Cole Ferguson*	*Ferguson*	rcferguson@fci-engr.com	*(281) 252-9232*		
9.	*Chris Whitfield*	*Lochner*	cwhitfield@hwlochner.com	*(972) 658-2433*	✓	
10.	*Kailey Galliani*	*Lochner*	kculps@hwlochner.com	*(817) 914-8591*	✓	

COMANCHE COUNTY-CITY AIRPORT (MKN)
COUNTY OF COMANCHE & CITY OF COMANCHE, TEXAS

LOCHNER

Airfield Electrical Improvement Project

CSJ NO. 2223COMAN

Pre-Bid Meeting
Comanche County-City Airport
Thursday, November 3, 2022; 10:00 a.m

	Name	Company	Email	Telephone	Present	Call-In
11.	*Blake Mason*	*Lochner*	bmason@hwlochner.com	*(817) 733-3153*	✓	
12.	*Harry Lorton*	*Lochner*	hlorton@hwlochner.com	*(830) 857-1405*		
13.	*Bob Jutton*	*Lochner*	bjutton@hwlochner.com	*(817) 371-8472*		
14.	Sam Waldrop	Waldrop Construction	sam@waldropconstruction.com	325 998 7700	SW	
15.	Justin Townsend	Sullivan Contracting Svc.	justin@scs-tx.com	830-743-2969	JT	
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