

#### Issued Thursday, February 6, 2025

#### 2507BGLKE - Addendum No. 2 to Plans, Contract Documents and Specifications

#### Reagan County Airport (E41) Runway 16-34 Reconstruction TxDOT CSJ No. 2507BGLKE

This addendum shall be a part of the Plans, Contract Documents and Specifications to the same extent as though it were originally included therein, and it shall supersede anything contained in the Plans, Contract Documents and Specifications with which it might conflict. Acknowledgement of receipt of this Addendum must be provided on TxDOT Bid Form page 7 of 8 included in the Contract Documents.

#### **Bidder Questions:**

Q20: Sheet GC-100, Phase 1 calls out to install a displaced threshold on Runway 9-27, but no detail or location is provided. Please provide the detail and location for the displaced threshold.?

A20: The temporary displaced threshold referenced on Sheet GC-100 for Phase 1 is the displaced threshold on Runway 27 that is depicted on sheets GC-107 and GC-201. As Runway 9-27 is currently an unlit runway, this displaced threshold will be markings-only. A temporary displaced threshold is also to be installed on Runway 34 during Phase 2 and that location is shown on sheets GC-202 and GC-301. This threshold will be lighted and new detail sheets, GC-602 and GC-603, will be added to show the new proposed lighting for the temporary displaced threshold.

Q21: Sheets EL103A and EL103B show a 2w-4" Duct bank and says to refer to electrical one line for conductor sizing. This run does not appear to be on the one line and appears to not connect to anything. Please clarify the intent for this run and if the contractor is supposed to install cable in this duct bank.?

A21: The intent of this line is to be an empty conduit system for future use at the new terminal apron. No conductors will be installed.

Q22: Sheets EL103A and EL103B show contractor to install new 4'x6'x3' utility pull boxes. Please provide detail and method of payment for these boxes?

A22: After further coordination with the electric utility, AEP Texas, it was determined that the utility will furnish the pull boxes for this primary conduit system when primary cable is installed. These sheets will be revised to remove the pull boxes from the plans. The bid form and specifications L-115 MOD and L-115 were also revised to remove pay item L-115-5.5.

## Q23: Sheet EL109 shows to install new above ground primary pull box on new foundation. Please provide dimensions and details for these pullboxes?

A23: After further coordination and clarification with AEP Texas, it was determined that the above ground pull boxes in question will be provided and installed by AEP Texas, not the Contractor. Sheet EL-109 has been revised to reflect this change. The bid form and specifications L-115 MOD and L-115 were also revised to remove pay item L-115-5.5.

Q24: As a point of clarification, can you advise what would happen to the bid bond if the low bidder's HSP were to be rejected?

A24: The HSP is a requirement on the NTB, therefore if HSP considered non-responsive, then Bid Response would be considered non-responsive, therefore Bid Bonds will be returned upon request after TxDOT has made a comparison of bids as specified in the subsection titled CONSIDERATION OF BIDS of this section.

Q25: Pertaining to Drawing EL-202, Detail 1, One-line Diagram – where are the "waterproof L-823 splices to be located? Are these to be accomplished with two (2) primary connector kits for each circuit??

A25: The waterproof splices kits are located in the voltage power interface box indicated by keyed note 15 on sheet EL-203. Yes, a primary connector kit is needed for each L-824C, 600V-rated cable as indicated by keyed notes 12 and 13 on sheet EL-202.

Q26: Pertaining to Drawing EL-202, what is the load on the beacon circuit for the sizing the boost transformer, keyed note 11? What is the location of the transformer?

A26: The existing beacon is a Halibrite L-802A with a load of 965W. The buck/boost transformer shall be located in the new electrical vault.

Q27: Pertaining to Drawing EL-202, what is the load on the AWOS circuit for the sizing the boost transformer, keyed note 11? What is the location of the transformer?

A27: The existing AWOS has a load of 3.84kW at 240V. The buck/boost transformer shall be located in the new electrical vault.

Q28: Pertaining to Drawing EL-202, keyed notes 12 and 13 – what is the pay item for the AWG #8 600V L-824C conductors feeding the beacon and wind cone?

A28: The #8 AWG 600V L-824C conductors shall be quantified with #8 AWG 5kV L-824C conductors.

Q29: Pertaining to Drawing EL-203, Detail 1, Electrical Vault Airfield Plan -a "local non-fused disconnect switch" is detailed on the vault's south exterior wall. How is this fed? What are the specifics for the required switch?

A29: This will be a 100A/2P heavy-duty, NEMA 3R disconnect switch. Sheet EL-202 will be revised to show the location of the disconnect switch within the one-line diagram.

Q30: Pertaining to Drawing EL-203, Detail 1, Electrical Vault Footing -there is a note indicating that 1/2 " X 4"G.S. wedge anchors are "installed by others." Please clarify in whose scope of work is this item?

A30: The wedge anchors are in the scope of work for the manufacturer of the precast electrical vault building.

#### Changes Made To The Plans:

- REVISED Sheet GI-002 Revised index of sheets due to the addition of sheet GC-602 and GC-603.
- 2. **REVISED** Sheets GI-003 Revised sheet to reflect updated pay items.
- 3. ADDED Sheet GC-602 Added temporary displaced threshold with lights detail.
- 4. ADDED Sheet GC-603 Added temporary lighting details.
- 5. **REVISED** Sheets EL-103A Revised sheet to remove reference to the installation of conductors and removed the installation of the handholes.

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- 6. **REVISED** Sheets EL-103B Revised sheet to remove reference to the installation of conductors and removed the installation of the handholes.
- 7. **REVISED** Sheets EL-109 Revised sheet to change reference to above ground pull boxes being contractor furnished and installed.

#### **Changes Made to The Technical Specifications:**

- 1. **REVISED** L-115 This specification has been revised to remove pay item L-115-5.5.
- 2. **REVISED** L-115 MOD This specification has been revised to remove pay item L-115-5.5.

#### Changes Made to the TxDOT Bid Form for 2507BGLKE:

The revised bid form that was uploaded to the TxDOT Website 'Plans Online' was updated to include the allowances for following bid items:

Base Bid – Runway 16-34 Reconstruction

 REVISED Base Bid Pay Item SS-302-3.1: Power Utility Allowance – Revised allowance amount to \$75,000

Bid Additive No.1 – New Terminal Apron

• **REMOVED** Bid Additive No.1 Pay Item L-115-5.5

By:

Matthew LeMay, P.E. / Project Manager Email: MCLEMAY@GARVERUSA.COM

### Addendum No. 2 Attachments:

Revised Sheet GI-002 Revised Sheet GI-003 Added Sheet GC-602 Added Sheet GC-603 Revised Sheet EL-103A Revised Sheet EL-103B Revised Sheet EL-109 Revised Technical Specification MOD L-115 Revised Technical Specification L-115 Revised Bid Form



# PLAN REVISIONS

Addendum No. 2



Garver Project No. 2300661

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| REV. DATE                          | 1 02/04/25   | 2 02/06/25  |  |   |
| REAGAN COUNTY                      | AIRPORT (E41)<br>BIG LAKE, TEXAS   |   |  | RECONSTRUCTION PROJECT  |
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| 34               | L-107-5.1                 | L-806(L) STYLE I-B, SIZE 1, WIND CONE AND FOUNDATION, IN PLACE   | EA    | 1                      |                       |
| 5                | L-108-5.1                 | NO. 8 AWG, 5 kV, L-824, TYPE C CABLE,<br>INSTALLED IN TRENCH, DUCT BANK OR<br>CONDUIT  | LF    | 39,000                 |                       |
| 36               | L-108-5.2                 | NO. 6 AWG, SOLID, BARE COPPER<br>COUNTERPOISE WIRE, INSTALLED IN<br>TRENCH, ABOVE THE DUCT BANK OR<br>CONDUIT, INCLUDING<br>CONNECTIONS/TERMINATIONS | LF    | 23,000                 |                       |
| 37               | L-108-5.3                 | NO. 4 AWG, STRANDED, 600V RATED, TYPE<br>THHN/THWN-2 CABLE, INSTALLED IN DUCT<br>BANK OR CONDUIT   | LF    | 500                    |                       |
| 38               | L-108-5.4                 | NO. 6 AWG, STRANDED, 600V RATED, TYPE<br>THHN/THWN-2 CABLE, INSTALLED IN DUCT<br>BANK OR CONDUIT   | LF    | 4,100                  |                       |
| 39               | L-108-5.5                 | NO. 12 AWG, STRANDED, 600V RATED, TYPE<br>THHN/THWN-2, GREEN INSULATED<br>EQUIPMENT GROUND, INSTALLED IN DUCT  | LF    | 1,000                  |                       |

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|     | <u> </u>  | BASE BID   | $\sim\sim\sim$ |           |          |
|-----|-----------|--|----------------|-----------|----------|
|     | SDEC      |  |                | ESTIMATED |          |
| NO. | NO.       | DESCRIPTION  | UNIT           | QUANTITY  | QUANTITY |
| 40  | L-108-5.6 | NO. 2 AWG, STRANDED, 600V RATED, TYPE<br>THHN/THWN-2 CABLE, INSTALLED IN DUCT<br>BANK OR CONDUIT | LF             | 575       |          |
| 41  | L-109-7.1 | CONSTRUCTION OF AIRPORT<br>TRANSFORMER VAULT IN PLACE  | LS             | 1         |          |
| 42  | L-109-7.2 | INSTALLATION OF AIRPORT TRANSFORMER<br>VAULT EQUIPMENT IN PLACE                                  | LS             | 1         |          |
| 43  | L-110-5.1 | NON-ENCASED ELECTRICAL CONDUIT,<br>1-WAY 2-INCH  | LF             | 18,000    |          |
| 44  | L-110-5.2 | NON-ENCASED ELECTRICAL DUCT BANK,<br>4-WAY 2-INCH  | LF             | 1,230     |          |
| 45  | L-110-5.3 | NON-ENCASED ELECTRICAL DUCT BANK,<br>3-WAY 2-INCH  | LF             | 950       |          |
| 46  | L-110-5.4 | CONCRETE ENCASED ELECTRICAL DUCT<br>BANK,<br>3-WAY 2-INCH  | LF             | 200       |          |
| 47  | L-110-5.5 | CONCRETE ENCASED ELECTRICAL DUCT<br>BANK,<br>2-WAY 2-INCH  | LF             | 75        |          |
| 48  | L-110-5.6 | NON-ENCASED, UTILITY-STYLE, ELECTRICAL<br>DUCT BANK, 2-WAY 6-INCH                                | LF             | 550       |          |
| 49  | L-110-5.7 | CONCRETE ENCASED ELECTRICAL DUCT<br>BANK,<br>1-WAY 2-INCH  | LF             | 100       |          |
| 50  | L-110-5.8 | NON-ENCASED ELECTRICAL DUCT BANK,<br>2-WAY 2-INCH  | LF             | 1,600     |          |
| 51  | L-115-5.1 | 4-CAN JUNCTION CAN PLAZA, IN PLACE   | EA             | 1         |          |
| 52  | L-115-5.2 | 3-CAN JUNCTION CAN PLAZA, IN PLACE   | EA             | 6         |          |
| 53  | L-115-5.3 | 2-CAN JUNCTION CAN PLAZA, IN PLACE   | EA             | 4         |          |
| 54  | L-115-5.4 | CONCRETE ENCASED ELECTRICAL<br>JUNCTION STRUCTURE, L-867 CLASS 1, SIZE<br>B, 24" DEPTH, IN PLACE | EA             | 8         |          |
| 55  | L-125-5.1 | L-861(L) BASE MOUNTED RUNWAY EDGE<br>LIGHT, INSTALLED  | EA             | 54        |          |
| 56  | L-125-5.2 | L-861E(L) BASE MOUNTED RUNWAY<br>THRESHOLD/END LIGHT, INSTALLED                                  | EA             | 24        |          |
| 57  | L-125-5.3 | L-858(L) BASE MOUNTED, 2-MODULE<br>GUIDANCE SIGN, INSTALLED                                      | EA             | 2         |          |
| 58  | L-125-5.4 | L-858(L) BASE MOUNTED, 3-MODULE<br>GUIDANCE SIGN, INSTALLED                                      | EA             | 3         |          |
| 59  | L-125-5.5 | L-881(L) PRECISION APPROACH PATH<br>INDICATOR SYSTEM, INSTALLED ON<br>RUNWAY 16                  | LS             | 1         |          |
| 60  | L-125-5.6 | L-881(L) PRECISION APPROACH PATH<br>INDICATOR SYSTEM, INSTALLED ON<br>RUNWAY 34                  | LS             | 1         |          |
| 61  | L-125-5.7 | L-853 ELEVATED, STAKE-MOUNTED,<br>RETROREFLECTIVE MARKER, INSTALLED                              | EA             | 48        |          |

| $\sim$    |                   |   | $\sim$    | ~~~~~         | <u> </u> |                        |   |  |  |
|-----------|-------------------|---|-----------|---------------|----------|------------------------|---|--|--|
|           | BI                | D ADDITIVE NO. 1 - NEW TER  | MINAL     | APRON         |          | ξ                      |   |  |  |
| ITEM      | SPEC.             | DESCRIPTION   |           | ESTIMATED     | AS-BUILT | $\langle$              |   |  |  |
| NO.       | NO.               |   |           | QUANTITY      | QUANTITY | $\langle$              |   |  |  |
| 62        | SS-262-5.1        |   |           | 18            |          |                        |   |  |  |
| 64        | P-151-4.1         |   |           | 3             |          | ~                      | G   | D\/  | ED   |
| 65        | P-602-5 1         |   |           | 3 100         |          | < Ⅰ                    | © 202   | 25 GARVER  |  |
| 00        | F-002-3.1         | FIRST APPLICATION OF YELLOW PAVEMENT  | GAL       | 3,100         |          |                        | S DOCUN<br>EAS AND  | MENT, ALON<br>DESIGNS  | NG WITH THE<br>CONVEYED  |
| 66        | P-620-5.1b-2      | MARKINGS, 15 WET-MILS, TYPE III<br>WATERBORNE   | SF        | 900           |          |                        | EREIN, SI<br>STRUMEN<br>RVICE A<br>GARVI                      | HALL BE CO<br>ITS OF PRO<br>ND ARE PR<br>ER. LLC. AN                           | ONSIDERED<br>OFESSIONAL<br>OPERTY OF<br>IY USE.  |
| 67        | P-620-5.1b-5      | SECOND APPLICATION OF YELLOW<br>PAVEMENT MARKINGS, 15 WET-MILS, TYPE III<br>WATERBORNE, INCLUDING TYPE 3<br>REFLECTIVE MEDIA, IOR 1.9 | SF        | 900           |          | REF<br>OF<br>THE<br>HI | PRODUC<br>THIS DC<br>IDEAS A<br>EREIN, IS<br>AUTHOR<br>GARVER | TION, OR D<br>CUMENT, A<br>ND DESIGN<br>PROHIBITI<br>IZED IN WF<br>, LLC OR EX | STRIBUTION<br>ALONG WITH<br>CONTAINED<br>ED UNLESS<br>RITING BY<br>KPLICITLY<br>OVERNING |
| 68        | P-620-5.1b-3      | FIRST APPLICATION OF BLACK PAVEMENT<br>MARKINGS, 30 WET-MILS, TYPE III<br>WATERBORNE  | SF        | 1,600         |          |                        |   | SSIONAL SE<br>ENT FOR TH<br>TRATIC<br>F-5713                                   | ERVICES<br>HIS WORK.   |
| 69        | TX-247.6.1        | FLEXIBLE BASE, COMPLETE IN PLACE,<br>TYPE A GRADE 1-2 (10-INCH THICKNESS)   | CY        | 2,800         |          | $\left\{ \right\}$     |   |  |  |
| 70        | TX-341.5.1        | DENSE-GRADED HOT-MIX ASPHALT,<br>TYPE D, SAC B, PG 64-22 (3-INCH THICKNESS,<br>1 LIFT)  | TON       | 1,900         |          |                        |   |  |  |
| 71        | L-110-5.9         | NON-ENCASED UTILITY-STYLE, ELECTRICAL<br>DUCT BANK, 2-WAY 4-INCH  | LF        | 1,200         |          | $\langle$              | ~   |  |  |
|           | BID               | ADDITIVE NO. 2 - TAXILANE   | C MILL    | & PAVE        |          |                        | MATTH   | EW C.  | LEMAY  |
|           | SPEC.             | DESCRIPTION   | UNIT      |               | AS-BUILT | 5 /                    | No.1  | LICENS E   | ICIN CON   |
| NU.<br>72 | NU.<br>99-262-5-1 |   | F۵        | QUANTIT<br>15 | QUANTIT  | $\langle  $            |   | SIONALE  |  |
| 73        | P_101_5 2         | COLD MILLING (2-INCHES)   | <u>SY</u> | 6 700         |          | $\langle   -  $        | Digitally   | Signed 02/   | 06/2025  |
| 74        | P-101-5.4         |   | FA        | 22            |          | <[]≧                   | HAK   | MCL  |  |
| 75        | P-602-5 1         | EMULISIELED ASPHALT PRIME COAT  |           | 2.010         |          | $\langle \mid \mid$    |   |  |  |
| 75        | F-002-3.1         | FIRST APPLICATION OF YELLOW PAVEMENT  | GAL       | 2,010         |          | $\left  \right $       |   |  |  |
| 76        | P-620-5.1b-2      | MARKINGS, 15 WET-MILS, TYPE III<br>WATERBORNE   | SF        | 800           |          | )<br>) No              | NO. 1   | NO. 2  |  |
| 77        | P-620-5.1b-5      | SECOND APPLICATION OF YELLOW<br>PAVEMENT MARKINGS, 15 WET-MILS, TYPE III<br>WATERBORNE, INCLUDING TYPE 3<br>REFLECTIVE MEDIA, IOR 1.9 | SF        | 800           |          | DESCRIPTI              | ADDENDUM  | ADDENDUM I   |  |
| 78        | P-620-5.1b-3      | FIRST APPLICATION OF BLACK PAVEMENT<br>MARKINGS, 30 WET-MILS, TYPE III<br>WATERBORNE  | SF        | 1,600         |          |                        | 10  | 10   |  |
| 79        | TX-341.5.1        | DENSE-GRADED HOT-MIX ASPHALT,<br>TYPE D, SAC B, PG 64-22 (2-INCH THICKNESS,<br>1 LIFT)  | TON       | 830           |          | DATE                   | 02/04/25  | 02/06/25   |  |
|           |                   |   |           |               |          | Д 2 2 В REAGAN COUNTY  | DI TELAN<br>DI TELAN<br>DI TELAN<br>DI TELAN<br>DI TELAN      | RY OF<br>TIES  | RLNWAY 16-34<br>RECONSTRUCTION PROJECT   |
|           |                   |   |           |               |          |                        |   | I BY: JA   | AH<br>CH ON<br>WING<br>1"<br>THIS SHEET,   |

|             | BID          | ADDITIVE NO. 2 - TAXILANE   | C MILL | & PAVE                |                      |
|-------------|--------------|---|--------|-----------------------|----------------------|
| ITEM<br>NO. | SPEC.<br>NO. | DESCRIPTION   | UNIT   | ESTIMATED<br>QUANTITY | AS-BUILT<br>QUANTITY |
| 72          | SS-262-5.1   | TIE DOWN ANCHOR   | EA     | 15                    |                      |
| 73          | P-101-5.2    | COLD MILLING (2-INCHES)   | SY     | 6,700                 |                      |
| 74          | P-101-5.4    | EXISTING TIE DOWN REMOVAL   | EA     | 22                    |                      |
| 75          | P-602-5.1    | EMULSIFIED ASPHALT PRIME COAT   | GAL    | 2,010                 |                      |
| 76          | P-620-5.1b-2 | FIRST APPLICATION OF YELLOW PAVEMENT<br>MARKINGS, 15 WET-MILS, TYPE III<br>WATERBORNE   | SF     | 800                   |                      |
| 77          | P-620-5.1b-5 | SECOND APPLICATION OF YELLOW<br>PAVEMENT MARKINGS, 15 WET-MILS, TYPE III<br>WATERBORNE, INCLUDING TYPE 3<br>REFLECTIVE MEDIA, IOR 1.9 | SF     | 800                   |                      |
| 78          | P-620-5.1b-3 | FIRST APPLICATION OF BLACK PAVEMENT<br>MARKINGS, 30 WET-MILS, TYPE III<br>WATERBORNE  | SF     | 1,600                 |                      |
| 79          | TX-341.5.1   | DENSE-GRADED HOT-MIX ASPHALT,<br>TYPE D, SAC B, PG 64-22 (2-INCH THICKNESS,<br>1 LIFT)  | TON    | 830                   |                      |

NOTE:

SUMMARY OF QUANTITIES DOES NOT REPRENSENT FINAL CONTRACT VALUE, PAY-ITEMS, OR CONTRACT QUANTITIES. ACTUAL CONTRACT VALUE, PAY-ITEMS, AND CONTRACT QUANTITIES SHALL BE DETERMINED BY THE CONTRACTOR'S BID. 

DRAWING NUMBER

GI-003

SHEET NUMBER



- INSTALL W/Y LIGHT FIXTURES ON FINAL 2000' OF RUNWAY

— L-824C CABLE IN 2" CONDUIT

L-824C CABLE IN 2" CONDUIT

- NEW L-823 3'-0" CONNECTORS (TYPICAL)



- SHEETS.
- AND CONDUIT ARE PROTECTED.



INSTALL NEW BREAK-OUT RING(S). AT CABLE -EXIT NOTCH OUT, INSTALL DUCT SEAL TO SEAL AROUND CABLE EXIT AND PREVENT FOREIGN **OBJECTS AND DEBRIS FROM ENTERING LIGHT** BASE. INSTALL APPROPRIATE # OF RINGS TO ENSURE CONDUIT CAN ENTER BASE CAN INSTALL NEW ABOVE GROUND TEMPORARY -JUMPER CABLES WITHIN NEW SCHEDULE 80 PVC CONDUIT, ANCHORED AT 5' INTERVALS, TO NEXT FIXTURE OR OTHER CONNECTION POINT. LOCATED EVERY 5' ALONG ENTIRE LENGTH OF JUMPER Δ Δ  $\triangleleft$ PLUG OTHER CONNECTOR WATERTIGHT Δ Δ **INSTALL NEW L-823 CONNECTORS** WITH HEAT SHRINK AND CABLE  $\triangleleft$ TAGS, MINIMUM 3' SLACK Δ  $\triangleleft$ NOTES: 1. IN PLACE OF THE BREAK OUT RING ASSEMBLY, THE Δ CONTRACTOR MAY INSTALL A NEW MULTIPLE OPENING BASE PLATE THAT HAS A LIGHT FIXTURE MOUNTING HOLE, A SEPARATE HOLE FOR CONDUIT ENTRY, AND A GROUNDING PROVISION. INSTALL NEW GRS LB FITTING SECURED TO BASE PLATE HOLE FOLLOWED BY A GRSC/PVC FITTING TO CONNECT THE SCHEDULE 80 PVC CONDUIT. REINSTALL FIXTURE AND CONNECT TO GROUND PROVISION FROM BASE PLATE TO JUNCTION BASE INTERNAL LUG. SCALE: NONE \GC-603/ AM pc3 9:39 gwb. Id MA 00 Щ41 14 €41 С.С. iii. 



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## **TEMPORARY JUMPER CIRCUIT CONNECTION**



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### BREAK-OUT RING NOTES:

- FOR 12" L-867B CAN.
- 2. OUTSIDE DIMENSION SHALL MATCH EXISTING CAN.
- PLYWOOD WITH 10 MIL POLYURETHANE FINISH APPLIED AFTER TEMPORARY CABLE IS INSTALLED.



| MAXIMUM CONDUIT FILL |               |  |  |
|----------------------|---------------|--|--|
| SCHEDULE 80          | NUMBER OF     |  |  |
| PVC TRADE SIZE       | L-824C CABLES |  |  |
| 1"                   | 2             |  |  |
| 1-1/4"               | 3             |  |  |
| 1-1/2"               | 5             |  |  |

### FILL NOTE:

IDENTIFY ANY SIZE CHANGES.

SECTION

1. HOLE PATTERN SHALL MATCH EXISTING BASE CAN. PATTERN SHOWN IS

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3. BREAK-OUT RING SHALL BE FABRICATED FROM 3/4" MARINE GRADE A

4. BREAK-OUT RINGS, ABOVE GROUND CONDUIT, JUMPER CABLES, LUMBER, SUPPORTS, HARDWARE, AND OTHER APPURTENANCES ARE INCIDENTAL TO THE TEMPORARY AIRFIELD LIGHTING PAY ITEM. CONTRACTOR SHALL SUPPLY SUFFICIENT QUANTITY TO SUPPORT ALL RE-WIRING ACTIVITIES.

## **BREAK OUT RING**

1. FOR NEW L-824C CABLE INSTALLED ON THIS PROJECT, THEBASIS-OF-DESIGN OUTSIDE DIAMETER THAT WAS USED IS 0.415 INCHES. IF THE CONTRACTOR USES L-824C CABLE WITH A LARGER OUTSIDE DIAMETER, ANY CONDUIT OR DUCT BANK INCREASES IN SIZE NECESSARY TO MAINTAIN CABLE FILL CODE COMPLIANCE SHALL BE INSTALLED AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER AND TO THE SATISFACTION OF THE ENGINEER. PAYMENT WILL ONLY BE MADE AT THE BASIS-OF-DESIGN CONDUIT OR DUCT BANK PAY ITEM SHOW ON THE PLANS. AS-BUILT DRAWINGS SHALL BE MARKED UP BY THE CONTRACTOR TO







RW 16-34





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### NOTES:

1. SEE SHEET EL-101 FOR LIGHTING INSTALLATION NOTES.

| CIRCUIT LEGEND |  |
|----------------|--|
|                |  |

R16E

RUNWAY 16-34 EDGE LIGHT CIRCUIT

PAPI-16

PAPI-34

RUNWAY 34 PAPI CIRCUIT

RUNWAY 16 PAPI CIRCUIT

(X) AFTER THE CIRCUIT LABEL INDICATES THE \* NUMBER OF CABLES OF THAT CIRCUIT PRESENT IN THAT CONDUIT/DUCT BANK; REFERENCE ONE-LINE DIAGRAM ON SHEET EL-202 FOR CONDUCTOR SIZES AND TYPES FOR EACH CIRCUIT.











# REVISED TECHNICAL SPECIFICATIONS

Addendum No. 2



Garver Project No. 2300661

#### ITEM L-115 ELECTRICAL MANHOLES AND JUNCTION STRUCTURES MODIFICATIONS

Item L-115 Electrical Manholes and Junction Structures is hereby amended with respect to the paragraphs and sections sited below.

#### Revise the following section 115-1.1 and 115-2.2 as noted:

**115-1.1** This item shall consist of electrical manholes and junction structures (hand holes, pull boxes, junction cans, etc.) installed per this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the RPR. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting and bracing, concrete, reinforcing steel, ladders, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the RPR. *Refer to Item SS-301 for additional electrical demolition work.* 

**115-2.2 Concrete structures.** Concrete shall be proportioned, placed, and cured per Item *TX-421 (Class C), Hydraulic Cement Concrete.* Cast-in-place concrete structures shall be as shown on the plans.

#### Remove the following section 115-2.3, 115-2.7, 115-2.8, 115-2.11, 115-2.12, and 115-2.15 as noted:

**115-2.3 Precast concrete structures.** Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another engineer approved third party certification program. Provide precast concrete structures where shown on the plans.

Precast concrete structures shall be an approved standard design of the manufacturer. Precast units shall have mortar or bitumastic sealer placed between all joints to make them watertight. The structure shall be designed to withstand 100,000 lb. aircraft *wheel* loads, unless otherwise shown on the plans. Openings or knockouts shall be provided in the structure as detailed on the plans.

Threaded inserts and pulling eyes shall be cast in as shown on the plans.

If the Contractor chooses to propose a different structural design, signed and sealed shop drawings, design calculations, and other information requested by the RPR shall be submitted by the Contractor to allow for a full evaluation by the RPR. The RPR shall review per the process defined in the General Provisions.

**115-2.7 Frames and covers.** The frames shall conform to one of the following requirements:

**a.** ASTM A48 Gray iron castings

b. ASTM A47 Malleable iron castings

c. ASTM A27 Steel castings

**d.** ASTM A283, Grade D Structural steel for grates and frames

e. ASTM A536 Ductile iron castings

f. ASTM A897 Austempered ductile iron castings

All castings specified shall withstand a maximum tire pressure of **250** psi and maximum load of **100,000** lbs.

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover unit shall be provided with fastening members to prevent it from being dislodged by traffic, but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

Each cover shall have the word "ELECTRIC" or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

Each manhole shall be provided with a "DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" safety warning sign as detailed in the Contract Documents and in accordance with OSHA 1910.146 (c)(2).

115-2.8 Ladders. Ladders, if specified, shall be galvanized steel or as shown on the plans.

**115-2.11 Flowable backfill.** Flowable material used to backfill shall conform to the requirements of Item P-153, Controlled Low Strength Material.

**115-2.12 Cable trays.** Cable trays shall be of galvanized steel. Cable trays shall be located as shown on the plans.

**115-2.15 Pulling-in irons.** Pulling-in irons shall be manufactured with 7/8-inch diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, ½-inch diameter with an ultimate strength of 270,000 psi). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

#### Revise the following section 115-2.16 as noted:

**115-2.16 Ground rods.** Ground rods shall be one piece, or copper clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than *108*-feet long nor less than *5/8 3/4* inch in diameter.

#### Remove the following section 115-3.3 as noted:

**115-3.3 Precast unit installations.** Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

#### Revise the following section 115-3.4 as noted:

**115-3.4 Placement and treatment of castings, frames and fittings.** All castings, frames and fittings shall be placed in the positions indicated on the Plans or as directed by the RPR and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written approval is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of parts shall be reported immediately to the RPR and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor's expense.

Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

#### Remove the following section 115-3.5, 115-3.13, and 115-3.14 as noted:

#### **Runway 16-34 Reconstruction**

**115-3.5 Installation of ladders.** Ladders shall be installed such that they may be removed if necessary. Mounting brackets shall be supplied top and bottom and shall be cast in place during fabrication of the structure or drilled and grouted in place after erection of the structure.

**115-3.13 Manhole elevation adjustments.** The Contractor shall adjust the tops of existing manholes in areas designated in the Contract Documents to the new elevations shown. The Contractor shall be responsible for determining the exact height adjustment required to raise or lower the top of each manhole to the new elevations. The existing top elevation of each manhole to be adjusted shall be determined in the field and subtracted/added from the proposed top elevation.

The Contractor shall remove/extend the existing top section or ring and cover on the manhole structure or manhole access. The Contractor shall install precast concrete sections or grade rings of the required dimensions to adjust the manhole top to the new proposed elevation or shall cut the existing manhole walls to shorten the existing structure, as required by final grades. The Contractor shall reinstall the manhole top section or ring and cover on top and check the new top elevation.

The Contractor shall construct a concrete slab around the top of adjusted structures located in graded areas that are not to be paved. The concrete slab shall conform to the dimensions shown on the plans.

**115-3.14 Duct extension to existing ducts.** Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

#### Remove the following section 115-5.2 as noted:

**115-5.2** Payment shall be made at the contract unit price for manhole elevation adjustments. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary, including but not limited to, spacers, concrete, rebar, dewatering, excavating, backfill, topsoil, sodding and pavement restoration, where required, to complete this item as shown in the plans and to the satisfaction of the RPR.

#### Replace the following pay items with the Basis of Payment with the following pay items:

Payment will be made under:

| Item L-115-5.1 | 4-Can Junction Can Plaza, in Place – Per Each   |
|----------------|---|
| Item L-115-5.2 | 3-Can Junction Can Plaza, in Place – Per Each   |
| Item L-115-5.3 | 2-Can Junction Can Plaza, in Place – Per Each   |
| Item L-115-5.4 | Concrete Encased Electrical Junction Structure, L-867 Class 1, Size B, 24" Depth, in Place – per Each |
| Item L-115-5.5 | 4'x6'x3' Utility Approved Primary Pull-Box, in Place per Each   |

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#### ITEM L-115 ELECTRICAL MANHOLES AND JUNCTION STRUCTURES

#### DESCRIPTION

**115-1.1** This item shall consist of electrical manholes and junction structures (hand holes, pull boxes, junction cans, etc.) installed per this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the RPR. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting and bracing, concrete, reinforcing steel, ladders, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the RPR. *Refer to Item SS-301 for additional electrical demolition work.* 

#### EQUIPMENT AND MATERIALS

#### 115-2.1 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 so requested by the RPR.

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

**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 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.

**115-2.2 Concrete structures.** Concrete shall be proportioned, placed, and cured per Item *TX-421 (Class C), Hydraulic Cement Concrete.* Cast-in-place concrete structures shall be as shown on the plans.

**115-2.3 Precast concrete structures.** Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another engineer approved third party certification program. Provide precast concrete structures where shown on the plans.

Precast concrete structures shall be an approved standard design of the manufacturer. Precast units shall have mortar or bitumastic sealer placed between all joints to make them watertight. The structure shall be designed to withstand 100,000 lb. aircraft *wheel* loads, unless otherwise shown on the plans. Openings or knockouts shall be provided in the structure as detailed on the plans.

Threaded inserts and pulling eyes shall be cast in as shown on the plans.

If the Contractor chooses to propose a different structural design, signed and sealed shop drawings, design calculations, and other information requested by the RPR shall be submitted by the Contractor to allow for a full evaluation by the RPR. The RPR shall review per the process defined in the General Provisions.

**115-2.4 Junction boxes.** Junction boxes shall be L-867 Class 1 (non-load bearing) or L-868 Class 1 (load bearing) airport light bases that are encased in concrete. The light bases shall have a L-894 blank cover, gasket, and stainless steel hardware. All bolts, studs, nuts, lock washers, and other similar fasteners used for the light fixture assemblies must be fabricated from 316L (equivalent to EN 1.4404), 18-8, 410, or 416 stainless steel is utilized it shall be passivated and be free from any discoloration. Covers shall be 3/8-inch thickness for L-867 and 3/4-inch thickness for L-868. All junction boxes shall be provided with both internal and external ground lugs.

**115-2.5 Mortar.** The mortar shall be composed of one part of cement and two parts of mortar sand, by volume. The cement shall be per the requirements in ASTM C150, Type I. The sand shall be per the requirements in ASTM C144. Hydrated lime may be added to the mixture of sand and cement in an amount not to exceed 15% of the weight of cement used. The hydrated lime shall meet the requirements of ASTM C206. Water shall be potable, reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product.

**115-2.6 Concrete.** Concrete shall be proportioned, placed, and cured per Item TX-421, Hydraulic Cement Concrete.

**115-2.7 Frames and covers.** The frames shall conform to one of the following requirements:

a. ASTM A48 Gray iron castings
b. ASTM A47 Malleable iron castings
c. ASTM A27 Steel castings
d. ASTM A283, Grade D Structural steel for grates and frames
e. ASTM A536 Ductile iron castings
f. ASTM A897 Austempered ductile iron castings

All castings specified shall withstand a maximum tire pressure of 250 psi and maximum load of 100,000 lbs.

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover unit shall be provided with fastening members to prevent it from being dislodged by traffic, but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

Each cover shall have the word "ELECTRIC" or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

Each manhole shall be provided with a "DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" safety warning sign as detailed in the Contract Documents and in accordance with OSHA 1910.146 (c)(2).

**115-2.8 Ladders.** Ladders, if specified, shall be galvanized steel or as shown on the plans.

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**115-2.9 Reinforcing steel.** All reinforcing steel shall be deformed bars of new billet steel meeting the requirements of ASTM A615, Grade 60.

115-2.10 Bedding/special backfill. Bedding or special backfill shall be as shown on the plans.

**115-2.11 Flowable backfill.** Flowable material used to backfill shall conform to the requirements of Item P-153, Controlled Low Strength Material.

**115-2.12 Cable trays.** Cable trays shall be of plastic. Cable trays shall be located as shown on the plans.

**115-2.13 Plastic conduit.** Plastic conduit shall comply with Item L-110, Airport Underground Electrical Duct Banks and Conduits.

**115-2.14 Conduit terminators.** Conduit terminators shall be pre-manufactured for the specific purpose and sized as required or as shown on the plans.

**115-2.15 Pulling-in irons.** Pulling-in irons shall be manufactured with 7/8-inch diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, ½-inch diameter with an ultimate strength of 270,000 psi). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

**115-2.16 Ground rods.** Ground rods shall be one piece, or copper clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than 8 feet long nor less than 5/8 inch in diameter.

#### CONSTRUCTION METHODS

**115-3.1 Unclassified excavation.** It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Damage to utility lines, through lack of care in excavating, shall be repaired or replaced to the satisfaction of the RPR without additional expense to the Owner.

The Contractor shall perform excavation for structures and structure footings to the lines and grades or elevations shown on the plans or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown.

All excavation shall be unclassified and shall be considered incidental to Item L-115. Dewatering necessary for structure installation and erosion per federal, state, and local requirements is incidental to Item L-115.

Boulders, logs and all other objectionable material encountered in excavation shall be removed. All rock and other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped or serrated, as directed by the RPR. All seams, crevices, disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation. Excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

The Contractor shall provide all bracing, sheeting and shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheeting and shoring shall be included in the unit price bid for the structure.

Unless otherwise provided, bracing, sheeting and shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner that will not disturb or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

After each excavation is completed, the Contractor shall notify the RPR. Structures shall be placed after the RPR has approved the depth of the excavation and the suitability of the foundation material.

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Prior to installation the Contractor shall provide a minimum of 6 inches (150 mm) of sand or a material approved by the RPR as a suitable base to receive the structure. The base material shall be compacted and graded level and at proper elevation to receive the structure in proper relation to the conduit grade or ground cover requirements, as indicated on the plans.

**115-3.2 Concrete structures.** Concrete structures shall be built on prepared foundations conforming to the dimensions and form indicated on the plans. The concrete and construction methods shall conform to the requirements specified in Item TX-421. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

**115-3.3 Precast unit installations.** Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

**115-3.4 Placement and treatment of castings, frames and fittings.** All castings, frames and fittings shall be placed in the positions indicated on the Plans or as directed by the RPR and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written approval is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of parts shall be reported immediately to the RPR and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor's expense.

Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

**115-3.5 Installation of ladders.** Ladders shall be installed such that they may be removed if necessary. Mounting brackets shall be supplied top and bottom and shall be cast in place during fabrication of the structure or drilled and grouted in place after erection of the structure.

**115-3.6 Removal of sheeting and bracing.** In general, all sheeting and bracing used to support the sides of trenches or other open excavations shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a structure shall be withdrawn, unless otherwise directed, before more than 6 inches of material is placed above the top of the structure and before any bracing is removed. Voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

The RPR may direct the Contractor to delay the removal of sheeting and bracing if, in his judgment, the installed work has not attained the necessary strength to permit placing of backfill.

**115-3.7 Backfilling.** After a structure has been completed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

Backfill shall not be placed against any structure until approval is given by the RPR. In the case of concrete, such approval shall not be given until tests made by the laboratory under supervision of the RPR establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

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Where required, the RPR may direct the Contractor to add, at his own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

**115-3.8 Connection of duct banks.** To relieve stress of joint between concrete-encased duct banks and structure walls, reinforcement rods shall be placed in the structure wall and shall be formed and tied into duct bank reinforcement at the time the duct bank is installed.

**115-3.9 Grounding.** A ground rod shall be installed in the floor of all concrete structures so that the top of rod extends 6 inches above the floor. The ground rod shall be installed within one foot of a corner of the concrete structure. Ground rods shall be installed prior to casting the bottom slab. Where the soil condition does not permit driving the ground rod into the earth without damage to the ground rod, the Contractor shall drill a 4-inch diameter hole into the earth to receive the ground rod. The hole around the ground rod shall be filled throughout its length, below slab, with Portland cement grout. Ground rods shall be installed in precast bottom slab of structures by drilling a hole through bottom slab and installing the ground rod. Bottom slab penetration shall be sealed watertight with Portland cement grout around the ground rod.

A grounding bus of 4/0 bare stranded copper shall be exothermically bonded to the ground rod and loop the concrete structure walls. The ground bus shall be a minimum of one foot above the floor of the structure and separate from other cables. No. 2 American wire gauge (AWG) bare copper pigtails shall bond the grounding bus to all cable trays and other metal hardware within the concrete structure. Connections to the grounding bus shall be exothermic. If an exothermic weld is not possible, connections to the grounding bus shall be made by using connectors approved for direct burial in soil or concrete per UL 467. Hardware connections may be mechanical, using a lug designed for that purpose.

**115-3.10 Cleanup and repair.** After erection of all galvanized items, damaged areas shall be repaired by applying a liquid cold-galvanizing compound per MIL-P-21035. Surfaces shall be prepared and compound applied per the manufacturer's recommendations.

Prior to acceptance, the entire structure shall be cleaned of all dirt and debris.

**115-3.11 Restoration.** After the backfill is completed, the Contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. All sodding, grading and restoration shall be considered incidental to the respective Item L-115 pay item.

The Contractor shall grade around structures as required to provide positive drainage away from the structure.

Areas with special surface treatment, such as roads, sidewalks, or other paved areas shall have backfill compacted to match surrounding areas, and surfaces shall be repaired using materials comparable to original materials.

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.

After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear and in good condition.

**115-3.12 Inspection.** Prior to final approval, the electrical structures shall be thoroughly inspected for conformance with the plans and this specification. Any indication of defects in materials or workmanship shall be further investigated and corrected. The earth resistance to ground of each ground rod shall not exceed 25 ohms. Each ground rod shall be tested using the fall-of-potential ground impedance test per American National Standards Institute / Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81. This test shall be performed prior to establishing connections to other ground electrodes.

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**115-3.13 Manhole elevation adjustments.** The Contractor shall adjust the tops of existing manholes in areas designated in the Contract Documents to the new elevations shown. The Contractor shall be responsible for determining the exact height adjustment required to raise or lower the top of each manhole to the new elevations. The existing top elevation of each manhole to be adjusted shall be determined in the field and subtracted/added from the proposed top elevation.

The Contractor shall remove/extend the existing top section or ring and cover on the manhole structure or manhole access. The Contractor shall install precast concrete sections or grade rings of the required dimensions to adjust the manhole top to the new proposed elevation or shall cut the existing manhole walls to shorten the existing structure, as required by final grades. The Contractor shall reinstall the manhole top section or ring and cover on top and check the new top elevation.

The Contractor shall construct a concrete slab around the top of adjusted structures located in graded areas that are not to be paved. The concrete slab shall conform to the dimensions shown on the plans.

**115-3.14 Duct extension to existing ducts.** Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

#### METHOD OF MEASUREMENT

**115-4.1** Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following items shall be included in the price of each unit: All required excavation and dewatering; sheeting and bracing; all required backfilling with on-site materials; restoration of all surfaces and finished grading and turfing; all required connections; temporary cables and connections; and ground rod testing

**115-4.2 Manhole elevation adjustments** shall be measured by the completed unit installed, in place, completed, and accepted. Separate measurement shall not be made for the various types and sizes.

#### BASIS OF PAYMENT

**115-5.1** The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to complete the item as shown on the plans and for all labor, equipment, tools and incidentals necessary to complete the structure.

**115-5.2** Payment shall be made at the contract unit price for manhole elevation adjustments. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary, including but not limited to, spacers, concrete, rebar, dewatering, excavating, backfill, topsoil, sodding and pavement restoration, where required, to complete this item as shown in the plans and to the satisfaction of the RPR.

Payment will be made under:

J

| tem L-115-5.1 | 4-Can Junction Can Plaza, in Place – Per Each   |
|---------------|---|
| tem L-115-5.2 | 3-Can Junction Can Plaza, in Place – Per Each   |
| tem L-115-5.3 | 2-Can Junction Can Plaza, in Place – Per Each   |
| tem L-115-5.4 | Concrete Encased Electrical Junction Structure, L-867 Class 1, Size B, 24" Depth, in Place – per Each |
| tem L-115-5.5 | <u>4'x6'x3' Utility-Approved Primary Pull-Box, in Place – per Each</u>                                |

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#### REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

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

| ANSI/IEEE STD 81            | IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System |
|-----------------------------|---|
| Advisory Circular (AC)      |   |
| AC 150/5345-7               | Specification for L-824 Underground Electrical Cable for Airport Lighting<br>Circuits                         |
| AC 150/5345-26              | Specification for L-823 Plug and Receptacle, Cable Connectors   |
| AC 150/5345-42              | Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories                  |
| AC 150/5340-30              | Design and Installation Details for Airport Visual Aids   |
| AC 150/5345-53              | Airport Lighting Equipment Certification Program  |
| Commercial Item Description | (CID)   |
| A-A 59544                   | Cable and Wire, Electrical (Power, Fixed Installation)  |
| ASTM International (ASTM)   |   |
| ASTM A27                    | Standard Specification for Steel Castings, Carbon, for General Application                                    |
| ASTM A47                    | Standard Specification for Ferritic Malleable Iron Castings   |
| ASTM A48                    | Standard Specification for Gray Iron Castings   |
| ASTM A123                   | Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products                      |
| ASTM A283                   | Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates                          |
| ASTM A536                   | Standard Specification for Ductile Iron Castings  |
| ASTM A615                   | Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement                    |
| ASTM A897                   | Standard Specification for Austempered Ductile Iron Castings  |
| ASTM C144                   | Standard Specification for Aggregate for Masonry Mortar   |

ASTM C150 Standard Specification for Portland Cement

ASTM C206 Standard Specification for Finishing Hydrated Lime

FAA Engineering Brief (EB)

EB #83 In Pavement Light Fixture Bolts

Mil Spec

MIL-P-21035

Paint High Zinc Dust Content, Galvanizing Repair

National Fire Protection Association (NFPA)

NFPA-70

National Electrical Code (NEC)

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