

ITEM L-106 SUBMITTALS, RECORD DOCUMENTS AND MAINTENANCE MANUALS

DESCRIPTION

106-1.1 GENERAL. The items described in this section are applicable to all electrical work by the Contractor. Where the contract special conditions or general provisions also apply, the stricter of the documents shall apply.

106-1.2 SCOPE. This section includes the requirements for submittals, record documents operation and maintenance (O&M) manuals. All submittals and O & M Manuals shall be submitted in book form as described in this item.

SHOW DRAWINGS AND SAMPLES

106-2.1 REQUIREMENTS FOR SHOP DRAWINGS AND SAMPLES. Shop drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier or distributor, and which illustrate some portion of the work.

Submittal data for electrical materials and equipment shall consist of shop drawings and/or catalog cuts showing technical data as necessary to evaluate the material or equipment, to include dimensions, wiring diagrams, performance curves, ratings, control sequence and other descriptive data necessary to describe fully the item proposed and its operating characteristics.

Samples are physical examples furnished by the Contractor to illustrate materials, equipment or workmanship, and to establish standards by which the work will be judged. Each sample shall be accompanied by the manufacturer's instructions regarding installation, operation and maintenance and shall be identified by item number, and specification.

The Contractor shall review, stamp with his approval and submit to the Engineer, one (1) reproducible and six (6) prints of shop drawings, six (6) copies of submittal books and three (3) sets of samples where required, as described in this item, within fifteen (15) days of notice to proceed.

If the Contractor desires to deviate from the requirements of the contract documents, the Contractor shall separately submit all deviations from the requirements of the contract documents in shop drawings or samples. The submission shall direct in writing the specific attention of the Engineer to the deviations, and shall contain all required data and supporting documentation necessary for an evaluation of the proposed deviation. Any submission or deviation not identified as heretofore mentioned shall be rejected and require resubmission. Separate written approval of all deviations by the Engineer for all design related deviations and by the Owner for all other deviations is required before the Contractor may perform the work covered by such deviation. By requesting a deviation, the Contractor makes the representations contained in this section.

If approval is given, the Contractor will not be excused from producing work in conformity with contract requirements. If a trial use establishes the work does not meet the contract requirements, the Contractor shall take such action as the Engineer determines necessary to meet the contract requirements. No change in contract time will be made as a result of changes made under this subparagraph. By requesting a deviation, the Contractor makes the representations contained in this section.

106-2.1.1 Substitutions will only be considered after bid date only if the following conditions are met and allowed by other sections of these specifications.

- a. Request for substitution is submitted no later than 15 days after notice to proceed for

construction is awarded to the Contractor.

b. Request for substitution includes appropriate credit to the project cost. This credit must be submitted with request for substitution in order for substitution to receive any consideration.

c. Samples are to be submitted for all substituted light fixtures, wiring devices and other items deemed necessary by the Engineer to determine that the substituted item meets all specifications and requirements before approval of substitutions can be made.

d. Samples shall be submitted within 15 days after the notice to proceed of the contract.

e. Request for substitution shall include the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and that data or any other data or information necessary for the Engineer to determine that the equipment meets all specifications and requirements.

f. Where permitted and approved, the substitution must conform to space requirements. Substitutions that cannot meet space requirements, which is the substitution installer's responsibility whether approved or not, shall be replaced at the Contractor's expense. Any substitution modifications of related systems, as a result of the substitution, shall be made at the Contractor's expense.

g. The Contractor represents that it has personally investigated the proposed substitution and determined that the proposed substitution is equal or superior in all respects to the specified method or equipment.

h. The Contractor represents that it will provide a warranty for the substitution identical in all respects to the warranty for the specified method or equipment.

i. The Contractor represents that it will coordinate the installation of the accepted substitute, making changes as may be required for the work to be complete in all respects at no additional costs to the Owner.

The Engineer shall be the sole judge of whether the proposed "or equal" is suitable for use in the work.

106-2.1.2 Substitutions will be considered prior to bid date only if all the following conditions are met:

a. A written request has been submitted to the Engineer for approval not less than 7 days prior to the bid date.

b. Substitution samples are to be submitted for all substituted light fixtures, wiring devices and other items deemed necessary by the Engineer to determine that the substituted item meets all specifications and requirements before approval of substitutions can be made.

c. Substitution samples shall be submitted not less than 7 days prior to the receipt of bids.

d. Request for substitution shall include the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and that data or any other data or information necessary for the Engineer to determine that the equipment meets all specifications and requirements.

e. Substitution is approved and included in an addendum.

By approving and submitting shop drawings and samples, the Contractor thereby represents that he/she has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data and that the Contractor, has checked and coordinated each shop drawing and sample with the requirements of the work of the contract documents.

Unless otherwise stated in the contract documents, the Engineer will review and approve shop drawings and samples within fifteen (15) days after receipt, but only for conformance with the design concept of the project and with the information given in the contract documents. The Engineer's approval of a separate item shall not indicate approval of an assembly in which the item functions.

The Contractor shall make any corrections required by the Engineer and shall resubmit the required number of corrected shop drawings or new samples until approved. The Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections requested by the Engineer on previous submissions.

The Engineer's approval of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the contract documents unless the Contractor has informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written approval to the specific deviation. **The Engineer's approval shall not relieve the Contractor from responsibility for errors or omissions in the shop drawings or samples.**

The submittals will be reviewed for design intent and general compliance with the information contained in the drawings and specifications. The Contractor is responsible for dimensions, quantities, fabrication processes and methods of construction, coordination of the Contractor's work with that of all trades. The Contractor shall be responsible for satisfactory performance of his work and supplying a complete and operational system.

No portion of the work requiring a shop drawing or sample submission shall be commenced until the submission has been approved by the Engineer. All such portions of the work shall be in accordance with approved shop drawings and samples.

Samples, upon request, shall be submitted after written notice of acceptance and approval has been made of each substitution. The Engineer reserves the right to reject the sample should the sample not meet the requirement of the contract documents.

106-2.2 SUBMITTAL BOOKS. Submittal books shall consist of a hard cover, view type, 3-ring binder sized to hold 8-1/2-inch x 11-inch sheets.

Each binder is to be adequately sized to comfortably hold required submittals. Minimum spline size to be 1-inch, maximum spline size to be 3-inches (provide additional binders if 3-inch size is not sufficient to properly hold submittals). Each binder shall be adequately sized to hold the submittal information plus an additional 25% of the submittal sheet count.

Binder covers to have outer clear vinyl pocket on front and back cover (to hold 8-1/2-inch x 11-inch sheet) and on spline (to hold spline width x 11-inch sheet). Binders shall be Wilson Jones Standard Locking D-Ring View Binders or approved equal. Provide correct designation of project in each pocket. See "EXAMPLES" Appendix A, Figures 1 and 2 included at the end of this section. Description sheet is to be white with black letters, maximum sheet height of 11-inches high and full width of pocket. Description is to describe project and match project drawing/specification description. Description to include submittal type. One (1) for the Airfield Lighting System materials (black) and one (1) for the Airfield Lighting Control System (blue).

106-2.3 SUBMITTAL BOOK CONTENTS. Submittal books to include:

- a. First sheet(s) in book shall be a photocopy of the cover sheet. See Appendix A, Figure 1.
- b. The second sheet shall be a table of contents.

c. Third sheet shall be prepared and filled out by the Contractor and shall list project addresses. See Appendix A, Figure 3.

d. Fourth sheet shall also be filled out by Contractor and list project information for project, Appendix A, Figure 4.

e. Provide Wilson Jones, reinforced clear, ring binder indexes, 5 tab No. WJ-54125 or approved equal with the appropriate specification section number, and a typed index for each section.

f. Submittals consisting of marked catalog sheets or shop drawings shall be inserted in the binder in proper order. Submittal data shall be presented in a clear 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 pertinent products or models applicable to this project. Markings shall be boldly and clearly made with arrows or circles (highlighting is not acceptable). 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 boldly and clearly made with arrows or circles (highlighting is not acceptable).

g. Shop Drawings: Drawings to include identification of project and name of Engineer, Contractor, subcontractors and suppliers, data, number sequentially and indicate the following:

(1) Fabrication and erection dimensions.

(2) Arrangements and sectional views.

(3) Necessary details, including complete information for making connections with other work.

(4) Kinds of materials and finishes.

(5) Descriptive names of equipment.

(6) Modifications and options to standard equipment required by the work.

(7) Leave blank area, size approximately 4-inches x 2-1/2-inches, near title block (Engineer's stamp imprint).

(8) Point-to-point wiring diagrams.

(9) Conduit/raceway rough-in drawings.

(10) See specific sections of specifications for further requirements.

106-2.4 SUBMITTAL BOOKS PRODUCT DATA. Technical data is required for all items as called for in the specifications regardless if item furnished is as specified.

a. Submit technical data verifying that the item submitted complies with the requirements of the specifications. Technical data shall include manufacturer's name and model number, dimensions, weights, electrical characteristics, and clearances required. Indicate all optional equipment and changes from the standard item as called for in the specifications. Furnish drawings or diagrams, dimensioned and in correct scale, covering equipment, showing arrangement of components and overall coordination.

b. In order to facilitate review of product data, insofar as practicable, they shall be noted, indicating by cross reference the contract drawings, note, and/or specification paragraph numbers where item(s) occur in the contract documents. At the end of each section insert a copy of the applicable

specification.

c. See specific sections of specifications for further requirements.

106-2.5 PROCESSING SUBMITTALS. Submit a minimum of six (6) submittal books with separate tag marking on each copy for the Owner (1), Engineer (4), Contractor and Subcontractor (See other sections of these specifications for additional quantity requirements.)

The Contractor shall review the submittal books before submitting to the Engineer. No request for payment will be considered until the submittal book has been reviewed, submitted for approval and approved.

Submit under provisions of the Special Conditions, Section 1 and this section of the specifications, whichever is the most strict.

Product Data: For standard manufactured materials, products and items, submit six (6) copies or sets of data. If submittal is rejected, resubmittal shall contain same quantity of new data.

Shop Drawings: For custom fabricated items and systems shop drawings, initially submit a transparency (suitable for reproduction) together with six (6) prints made therefrom. When submittal is acceptable, furnish one (1) print per book made from the accepted transparency.

Acceptance: When returned to Contractor, the front of each submittal section will be marked with the Engineers stamp. If box marked "Submit Specified Item", or "Rejected" or "Revise and Resubmit" is checked, submittal is not accepted and Contractor is to correct and resubmit as noted. Contractor is to comply with notation making necessary corrections on submittal and resubmit for final record. If submittal is marked "Approved", "Approved as Noted" or "Returned Without Action", Contractor may begin construction utilizing the submitted item with corrections made. However, the corrected submittal must be resubmitted for record keeping purposes. Contractor is to comply with notation making necessary corrections on submittal and resubmit for final record.

If the submittal is marked "Returned Without Action" the Engineer took no exceptions to the submitted.

If the submittal is marked "See Transmittal Letter Comments", the Contractor shall make or note any corrections or requirements identified in the comments. Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for; confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his or her work with that of all other trades and performing all work in a safe and satisfactory manner.

Note that the approval of shop drawings or other information submitted in accordance with the requirements herein before specified, does not assure that the Engineer, or any other Owner's authorized representative, attests to the dimensional accuracy or dimensional suitability of the material or equipment involved, the ability of the material or equipment involved or the mechanical/electrical performance of equipment. Approval of shop drawings does not invalidate the plans and specifications, if in conflict, unless a letter requesting such a change is submitted and approved on the Engineer's letterhead.

106-2.8 DELAYS. The Contractor is responsible for delays in project time accruing directly or indirectly from late submissions or resubmissions of shop drawings, or product data.

106-2.9 RE-SUBMITTALS. The Engineer shall be reimbursed the cost to review resubmittals subsequent to the second submittal. The cost of review of submittals after the second submittal will be determined and the cost shall be withheld from the Contractor's earnings each month permanently.

RECORD DOCUMENTS

106-3.1 PROGRESS AND RECORD DRAWINGS. Keep one set of blue line prints on the job and neatly mark up design drawings each day as components are installed. Different colored pencils shall be used to differentiate each system of electrical work. All items on progress drawings shall be shown in actual location installed. Drawings shall be inspected weekly for compliance and accuracy. Progress payments shall be withheld if the marked-up drawings are not current.

All underground ducts, conduits, drains, ground grids, force mains, etc., (all underground utilities) installed by the Contractor or located by the Contractor during the construction of this project shall be surveyed. The data shall be sufficient to accurately relocate the utility at a later date. The data shall include North-South and East-West coordinates and an elevation. This data shall be recorded on the as-built drawings.

All manholes and other structures installed by the Contractor shall be surveyed. The center of the structure shall be located by a North-South and East-West coordinate and an elevation. This data shall be recorded on the as-built drawings.

Change the equipment schedules to agree with items actually furnished. At the end of the project, all changes shall be transferred to a set of reproducible transparencies of the design drawings marked "As Built" and dated and stamped by the Contractor.

Prior to request for final payment, furnish a set of "As Built" sepia originals and four sets of prints along with the marked set defined above to the Engineer for approval. The final sepia originals shall be professionally drafted to indicate "As Built" conditions to the Engineer. The prints shall be stamped "As-Built", signed and dated by the electrical contractor.

The Contractor's failure to produce representative "As Built" drawings in accordance with requirements specified herein, shall be cause for the Engineer to produce such "As-built" drawings and the Contractor shall reimburse the Engineer for all costs to produce a set of "Record" drawings to the Owner's satisfaction.

Complete and sign the Progress and Record Document Certification Form in Appendix A, Figure 5 and submit with the Operation and Maintenance Manuals. Submit one form for each Contractor/Subcontractor providing as-built information and include a copy of each form in the O & M Manuals.

106-3.2 REQUIREMENTS FOR DISPLAY DRAWINGS. An "as built" control and field wiring diagram shall be displayed in the vault. Size D minimum framed and installed. In addition to the wiring diagram (showing actual connections between the system components), a "schematic" diagram shall be provided. A schematic diagram to show the electrical interrelation among the different systems components in the simplest way possible without being cluttered with actual wiring. It should show the path of the signal flow or the power flow. These drawings shall be submitted to the Engineer for approval. The Contractor shall coordinate the requirements with the Owner or his authorized representative and provide the above at no additional cost to the Owner.

OPERATION AND MAINTENANCE MANUALS

106-4.1 REQUIREMENTS FOR OPERATION AND MAINTENANCE MANUALS. Within each major division of work, each specification section in the contract documents which require submission of O & M information shall be individually identified by a typed index tab. The Contractor shall provide four (4) copies of manufacturer's manuals for all installed equipment. As a minimum, it shall contain the following:

- a. Safety precautions used while maintaining the equipment.

- b. Theory of circuit and system operation.
- c. Complete schematic and interconnecting wiring diagrams
- d. Complete parts list with each circuit component keyed to designations assigned on schematics and wiring diagrams. Complete information shall be given for each part to permit ordering for replacement purposes. This information shall include the components rating, name of manufacturer and the manufacturer's part number in addition to the following:
 - e. Recommended preventive maintenance, including care, cleaning, lubrication, service schedules, etc.
 - f. Troubleshooting procedures.
 - g. Physical characteristics (weight, size, mounting dimensions, etc.).
 - h. Installation instructions.
 - i. Operating instructions.
 - j. Recommended spare parts and usage for a 1 year period.
 - k. Submit for checking purposes a specific set of written operating instructions on each item which requires instructions to operate. After approval, provide one copy for insertion in each Operation and Maintenance Manual.
 - l. Submit for approval maintenance information consisting of manufacturer's printed instructions and parts list for each major item of equipment. After approval, insert information in each Operations and Maintenance Manual. Detailed schematic diagrams shall be furnished for all electrical/electronic equipment.
 - m. Bill of materials.
 - n. Physical layout plans.
 - o. Equipment supplier list.
 - p. Panel schedules shall be submitted with the respective panel data.
 - q. Special instructions.
 - r. Service maintenance contracts including the name, address and 24 hour phone number and contact of manufacturers authorized repair company.

There shall be no "Black Boxes" for which there are no schematic/wiring diagrams.

106-4.2 OPERATION AND MAINTENANCE MANUALS. O & M Manuals shall consist of hard cover, view type, 3-ring binders sized to hold 8-1/2-inch x 11-inch sheets.

Each binder is to be adequately sized to comfortably hold required submittals. Minimum spline size to be 1-inch, maximum spline size to be 3-inch (provide additional binders if 3-inch size is not sufficient to properly hold submittals). Each binder shall be adequately sized to hold the submittal information plus an additional 25% of the submittal sheet count.

Binder covers to have outer clear vinyl pocket on front and back cover (to hold 8-1/2-inch x 11-inch sheet) and on spine (to hold spine width x 11-inch sheet). Binders shall be Wilson Jones Standard Locking D-Ring View Binders or approved equivalent. Provide correct designation of project in each pocket, see "EXAMPLES" Appendix A, Figures 6 and 7 included at the end of this section. Description sheet is to be white with black letters, maximum sheet height of 11-inch high and full width of pocket. Description is to describe project and match pocket drawing/specification description. Description to include submittal type. One (1) for Airfield Lighting System Materials (black) and one (1) for the Airfield Lighting Control System (blue).

106-4.3 OPERATION AND MAINTENANCE MANUAL CONTENTS. O & M Manuals to include:

- a. First sheet in binder shall be a photocopy of the cover sheet see Appendix A, Figure 6.
- b. The second sheet shall be a table of contents.
- c. The third sheet shall be filled out by the Contractor and shall list project addresses, see Appendix A, Figure 3.
- d. The fourth sheet shall also be filled out by the Contractor and list project information for project, see Appendix A, Figure 4.
- e. Provide Wilson Jones, reinforced, clear, ring binder indexes, 5 tab No. WJ-54125 or approved equal with the appropriate specification section number, and typed index for each section.
- f. Shop Drawings: Shop drawings shall be a copy of the final and approved shop drawings submitted as required in Item L-106-2, Shop Drawings and Samples. These shall be inserted in the binder in proper order. Each catalog sheet shall clearly identify where the product is used and the drawing identification for equipment. Clear vinyl pockets shall be provided for insertion of shop drawings.
- g. Product data and/or catalog sheets shall be a copy of the final and approved submittal submitted as required in Item L-106-2, Shop Drawings and Samples. These shall be inserted in the binder proper order. Each catalog sheet shall clearly identify where the product is used and the drawing identification for equipment.
- h. Warranty/Guarantee: Provide a copy of the warranty/guarantee and letters of certification, in respective locations in the O & M Manual binder. Original warranty/guarantee is to be incorporated into a separate project warranty book with warranty/guarantees provided for other sections of the specifications and submitted for Engineer approval.
- i. Performance Verification and Demonstration to Owner (See Appendix A, Figure 2 form in L-131, Demonstrations, Tests and Performance Verification).
- j. Tabulated Data (as required in L-131, Demonstrations, Tests and Performance Verification).
- k. Required Check-Out Memos (see Appendix A, Figure 1 form in L-131, Demonstrations, Tests and Performance Verification).
- l. Progress and Record Drawing Certification (Appendix A, Figure 5)
- m. Ground Test Information (See Appendix A, Figure 4 form in L-131, Demonstrations, Tests and Performance Verification).

106-4.4 PROCESSING O & M MANUALS. Submit four (4) sets of O & M Manuals. The Contractor

shall review the manuals before submitting them to the Engineer.

106-4.5 DELAYS. The Contractor is responsible for delays in project time accruing directly or indirectly from late submissions or resubmissions of the Operation and Maintenance Manuals.

106-4.6 RE-SUBMITTALS. The Engineer shall be reimbursed the cost to review Operation and Maintenance Manuals, re-submittals subsequent to the second submittal. The cost of review of Operation and Maintenance Manuals after the second submittal will be determined and the cost shall be withheld from the Contractor's earnings each month permanently.

METHOD OF MEASUREMENT

106-5.1 The items described in this section are incidental to other sections and not shall be measured for payment.

BASIS OF PAYMENT

106-6.1 No direct payment shall be made for the work described in this section. The work described in this section is incidental to other items and shall be paid for in the respective bid item of which it is a component part.

"EXAMPLE"

**DULUTH AIRPORT AUTHORITY
DULUTH, MINNESOTA**

DULUTH INTERNATIONAL AIRPORT

**RUNWAY 3/21 PAVEMENT REHAB, TAXIWAY A4 PAVEMENT
REMOVAL, AND TAXIWAY LIGHTING**

AIRFIELD LIGHTING SUBMITTAL BOOK

APPENDIX A - FIGURE 1

"EXAMPLE"

**DULUTH AIRPORT AUTHORITY
DULUTH, MINNESOTA**

DULUTH INTERNATIONAL AIRPORT

**RUNWAY 3/21 PAVEMENT REHAB, TAXIWAY A4 PAVEMENT
REMOVAL, AND TAXIWAY LIGHTING**

**AIRFIELD
LIGHTING
SUBMITTAL
BOOK**

APPENDIX A - FIGURE 2

PROJECT ADDRESSES

OWNER: _____

PHONES: _____

CONSULTING ENGINEER: _____

GENERAL CONTRACTOR: _____

SUBCONTRACTORS: _____

SUPPLIERS: _____

APPENDIX A - FIGURE 3

PROJECT INFORMATION

Contractor shall fill in the blanks below and insert in the Submittal Books and the Operating and Maintenance Manuals. Submit one (1) sheet for each major division of Work.

Project Name: _____

Specification Division Number & Name: _____

Subcontractor: _____

Contact: _____ Phone Number: _____

Date Project Bid: _____

Project Start Date: _____

Days Allowed for Construction: _____

Target Completion: _____

Substantial Completion: _____

Certification Date: _____

	DATE SUBMITTED	DATE SUBMITTED
Closeout Documentation Manual:	_____	_____
Operating & Maintenance Manual:	_____	_____
Owner Performance Verification and Demonstrations:	_____	_____
Manufacturer's Performance Verification Memos:	_____	_____
Manufacturer's Test Data:	_____	_____
Record Documents:	_____	_____

APPENDIX A - FIGURE 4

PROGRESS AND RECORD DRAWING CERTIFICATION

This form shall be completed and submitted with the Record Documents. Submit one form for each Contractor/Subcontractor providing as-built information. Include a copy of this form in the Closeout Documentation Manual.

Project Name: _____

Specification Division Number & Name: _____

The Contractor's and Subcontractor's signatures below certify that the attached drawings and specifications were marked and revised as items were installed/changed, during the course of construction, and that these documents represent an accurate "Record-As Built" condition of the work as actually installed.

(Name of General Contractor)

(Signature, Title, Date)

(Name of Subcontractor)

(Signature, Title, Date)

APPENDIX A - FIGURE 5

"EXAMPLE"

**DULUTH AIRPORT AUTHORITY
DULUTH, MINNESOTA**

DULUTH INTERNATIONAL AIRPORT

**RUNWAY 3/21 PAVEMENT REHAB, TAXIWAY A4 PAVEMENT
REMOVAL, AND TAXIWAY LIGHTING**

**AIRFIELD LIGHTING OPERATION AND
MAINTENANCE MANUALS**

APPENDIX A - FIGURE 6

"EXAMPLE"

**DULUTH AIRPORT AUTHORITY
DULUTH, MINNESOTA**

DULUTH INTERNATIONAL AIRPORT

**RUNWAY 3/21 PAVEMENT REHAB, TAXIWAY A4 PAVEMENT
REMOVAL, AND TAXIWAY LIGHTING**

**OPERATION
AND
MAINTENANCE
MANUAL**

APPENDIX A - FIGURE 7

ELECTRICAL MATERIALS SUBMITTAL LIST

Spec. Section Number	Submittal Description	Date Received	Date Returned	Status
L-100	<p>Certification of Electrical Contractor's Experience Copy of Electrical Contractor's State Electrical License</p> <p>Certification of Electrical Superintendent's Experience Electrical Superintendent's resume' and copy of Journeyman Electrician License Electrical Superintendent's References, Airport Name, Contact and phone number</p> <p>Copy of each Journeyman Electrician's License</p> <p>Existing Facilities Investigation Memo</p> <p>Phenolic nameplates 1 to 1 scale detail of each nameplate SS pop rivets and silicone caulk Adhesive backed cloth markers Color code paint Permanent black marker Self-adhesive clear printed labels w/ black typed letters</p> <p>Welder qualifications Welding procedures</p> <p>Written verification providing proof of correspondence with representatives of all utilities/agencies to locate all existing utilities/systems within the project limits</p>			
L-105	<p>Insulation Resistance tests on existing circuits to be modified by Contractor</p> <p>Existing cable protection plan</p>			
L-107	<p>Each component shall be identified with the specific pay item of which it is a component part.</p> <p>L-806 Wind cone and all accessories L-807 Wind cone and all accessories</p> <p>Power Adapter Letter of Certification</p> <p>All other components not previously listed or as requested by the RPR.</p>			
L-108	<p>Each component shall be identified with the specific pay item of which it is a component part.</p> <p>List of proposed Airfield Lighting Cable Splicers</p> <p>Airfield Lighting Cable Splicer Qualifications</p> <p>All wire, conductors and cable assemblies including manufacturer's minimum cold weather installation temperature, minimum bend radius, maximum pull tension</p>			

	<p>L-824 5kV cable L-824 5kV cable Production Test Reports L-823 Connector Kits #4 AWG BSD copper counterpoise 4/0 AWG BSD copper counterpoise</p> <p>Compression butt splices Compression lugs C-Taps Compression tooling, calibration certificate, procedures and manufacturer's recommended practices Penciling tool</p> <p>Mechanical lugs and torquing requirements Torque wrench, calibration certificate and manufacturer's recommended practices Wire nuts Terminal blocks</p> <p>Insulation replacement systems, tapes, heat shrink tubing, etc. Electrical coatings Joint compound Pull ropes Cable pulling lubricant</p> <p>Color coding materials and/or methods Detectable marker tape with message and color Wire/cable markers Brass ID Tags and tyrap Brass ID Tag stamped sample (3 samples for each circuit impacted - stamped 5RCL, 5RTDZ, 5RE)</p> <p>SS wire mesh strain relief baskets for 5 kV cables</p> <p>¾" diameter by 10' long copper clad steel sectional ground rod Ground rod couplings Ground rod driving studs Exothermic connections Electrical coatings Electrical joint compound Grounding conductors Copper bus bar by size, type and use Ground rod inspection pit</p> <p>All other components not previously listed or as requested by the RPR.</p>			
L-109	<p>Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item.</p> <p>Shop drawings of each component, indicating FAA approval, shall be submitted to the RPR for review and approval and be approved prior to ordering any materials for this item. This submittal shall include the proposed method of installation for all components. The submittal shall include data on all component parts of the item or system, and shall include the manufacturers list of recommended spare parts for one years use.</p>			

	<p>Airfield Lighting Control System Upgrades</p> <p>Fire Alarm Control Panel, horns, strobes, pull stations, smoke detectors, heat detectors, etc.</p> <p>Circuit breakers</p> <p>Fuses and fuseholders</p> <p>Metering / Monitoring equipment</p> <p>Electrical systems controls and equipment</p> <p>Electrical power equipment</p> <p>Emergency Generator, Loadbank, battery charger, panel, etc.</p> <p>Automatic Transfer Switch</p> <p>Disconnect Switches</p> <p>Load centers</p> <p>Relays</p> <p>Transformers</p> <p>Panelboards</p> <p>Distribution panels</p> <p>Main panels, power panels</p> <p>Circuit Breakers</p> <p>Wiring devices</p> <p>Wiring systems</p> <p>Grounding systems</p> <p>Face plates</p> <p>Low voltage controls</p> <p>Outlets – convenience, special purpose</p> <p>Light switches, boxes, wiring devices, receptacles, etc.</p> <p>Voltage stabilizers</p> <p>Lighting fixtures – interior and exterior</p> <p>Exit signs</p> <p>Eye Wash Station</p> <p>Constant Current Regulators</p> <p>Plug cutouts</p> <p>Airfield Lighting Control System</p> <p>Radio Controller, antenna, etc.</p> <p>Photocells</p> <p>Conduit, ducts, wireways fittings, etc.</p> <p>Cable, wiring, splices, etc.</p> <p>Ground bus, ground grid conductor, ground jumpers, etc.</p> <p>Cabinets</p> <p>Condensing Unit</p> <p>Fan Cooling Unit</p> <p>Exhaust Fans</p> <p>Louvers, dampers, etc.</p> <p>Ductwork</p> <p>Unit Heaters</p> <p>Air Conditioning Units</p> <p>Fuel Tank, piping, etc.</p> <p>Doors</p> <p>Hardware</p> <p>Concrete Masonry materials</p> <p>Roofing materials</p> <p>All other components not previously listed or as requested by the RPR.</p>			
L-110	<p>Rigid galvanized steel (RGS) conduit</p> <p>Weather proof conduit hubs</p> <p>Locknuts</p> <p>Grounding bushings w/ insulated throat</p>			

	<p>Bushings w/ insulated throat Condulets, covers and gaskets Expansion fittings Conduit thread compound Long radius RGS bends Cold galvanizing compound Asphaltum paint</p> <p>2" and 4" schedule 40 PVC conduit 2" and 4" schedule 40 PVC end bells, fittings, terminations, cleaner and solvent cement Expansion fittings</p> <p>Split duct Inner duct</p> <p>E-LOC Couplings</p> <p>P-610 concrete mix</p> <p>2" and 4" schedule 40 PVC duct spacers and duct plugs Cable racks, supports, ties and straps detectable marker tape Drain sumps</p> <p>All other components not previously listed or as requested by the RPR.</p> <p>Each item submitted shall include the contractors proposed installation detail.</p>			
L-112	<p>Directional Bore Duct Directional Bore work plan, schedule, procedure, methods and equipment Directional Bore drilling fluid mixing and delivery system Directional Bore guidance system Maintenance of Traffic Plan</p> <p>All other components not previously listed or as requested by the RPR.</p>			
L-111 L-131	<p>Submit all materials, test equipment, written procedures, equipment calibration certificates for performing the following tests: Calibration Lab Qualifications Equipment dielectric testing Cable/conductor dielectric testing Qualification of firm performing dielectric testing Insulation resistance (megger) testing</p> <p>Fixture wiring sequence testing procedure Lighting system burn-in</p> <p>Airfield lighting photometric testing procedure and equipment Qualification of firm performing airfield lighting photometric testing</p> <p>Constant current regulator calibration and performance test procedure and test equipment</p>			

	<p>Airfield Lighting Control System and associated equipment Acceptance Testing</p> <p>Emergency generator, loadbank, and automatic transfer switch test</p> <p>Torquing of electrical terminations Torquing of anchor bolts</p> <p>Earth resistance testing Ground continuity/resistance testing Exothermic weld tests</p> <p>Equipment and support welding Transformer tests Testing required by equipment manuf.</p> <p>Welder qualifications Welding procedures</p> <p>Pavement sensor testing procedure, commissioning procedure and results</p> <p>All other components not previously listed or as requested by the RPR.</p>			
L-115	<p>Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item.</p> <p>Manholes Handholes Junction Boxes</p> <p>Each item's submittal shall include the following:</p> <ul style="list-style-type: none"> — Signed and sealed shop drawings by a registered structural P.E. — Grounding attachments — Covers, frames, rings, etc. — Spring assist — Pull iron — Cable racks — Section sealant — Rebar — All accessories <p>All other components not previously listed or as requested by the RPR.</p> <p>Each item submitted shall include the contractors proposed installation detail.</p>			
L-120	<p>Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item.</p> <p>Shop drawings of each airfield lighting component, indicating FAA approval, shall be submitted to the RPR for review and approval and be approved prior to ordering any materials for this item. This submittal shall include the proposed method of</p>			

	<p>installation for all airfield lighting components. The submittal shall include data on all component parts of the item or system, and shall include the manufacturers list of recommended spare parts for one years use.</p> <p>The manufacturer of the lighting fixtures proposed shall provide data, certification, and five (5) airport references that each type of proposed fixture, as currently designed unless a new design that has not been required in the United States heretofore, has been in operation under normal airfield conditions a minimum of 3 years with a certified repair requirement rate of no more than three (3) percent.</p> <p>Spare parts guarantee</p> <p>Lamp prices and price guarantee</p> <p>Survey of existing fixtures, base cans, etc per L-125 Airfield lighting fixture manufacturer qualifications</p> <p>Identification/number markers 24 each samples of ID markers stamped "17L-35R"</p> <p>Reinforcing steel SS bolting hardware including anti-rotational devices Anti-seize compound</p> <p>L-850A Runway Centerline Light including as applicable: light fixture, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, adapter rings, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-850B Touchdown Zone Light including as applicable: light fixture, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, adapter rings, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-850C Runway Edge Light including as applicable: light fixture, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, adapter rings, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-862 Runway Edge Light - including as applicable: light fixture, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, adapter rings, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-862E Runway Threshold Light including as applicable: light fixture, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, adapter rings, SS</p>			
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	<p>bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-867B Base Can L-867D Base Can L-868B Base Can</p> <p>Spare Parts</p> <p>Non-reflective cracking fabric Epoxy bonding compound including pavement compatibility statement Rebar P-610</p> <p>All bolting hardware not previously submitted</p> <p>Each item submitted shall include the contractors proposed installation detail.</p> <p>All other components not previously listed or as requested by the RPR.</p>			
L-121	<p>Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item.</p> <p>Shop drawings of each airfield lighting component, indicating FAA approval, shall be submitted to the RPR for review and approval and be approved prior to ordering any materials for this item. This submittal shall include the proposed method of installation for all airfield lighting components. The submittal shall include data on all component parts of the item or system, and shall include the manufacturers list of recommended spare parts for one years use.</p> <p>The manufacturer of the lighting fixtures proposed shall provide data, certification, and five (5) airport references that each type of proposed fixture, as currently designed unless a new design that has not been required in the United States heretofore, has been in operation under normal airfield conditions a minimum of 3 years with a certified repair requirement rate of no more than three (3) percent.</p> <p>Spare parts guarantee</p> <p>Lamp prices and price guarantee</p> <p>Survey of existing fixtures, base cans, etc per L-125 Airfield lighting fixture manufacturer qualifications</p> <p>Identification/number markers 24 each samples of ID markers</p> <p>Reinforcing steel SS bolting hardware including anti-rotational devices Anti-seize compound</p> <p>L-861T Taxiway Edge Light - including as applicable: light</p>			

	<p>fixture, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, adapter rings, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-867B Base Can L-867D Base Can L-868B Base Can</p> <p>Spare Parts</p> <p>Non-reflective cracking fabric Epoxy bonding compound including pavement compatibility statement Rebar P-610</p> <p>All bolting hardware not previously submitted</p> <p>Each item submitted shall include the contractors proposed installation detail.</p> <p>All other components not previously listed or as requested by the RPR.</p>			
L-123	<p>Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item.</p> <p>Shop drawings of each airfield lighting component, indicating FAA approval, shall be submitted to the RPR for review and approval and be approved prior to ordering any materials for this item. This submittal shall include the proposed method of installation for all airfield lighting components. The submittal shall include data on all component parts of the item or system, and shall include the manufacturers list of recommended spare parts for one years use.</p> <p>The manufacturer of the signs proposed shall provide data, certification, and five (5) airport references that each type of proposed fixture, as currently designed unless a new design that has not been required in the United States heretofore, has been in operation under normal airfield conditions a minimum of 3 years with a certified repair requirement rate of no more than three (3) percent.</p> <p>Spare parts guarantee</p> <p>Lamp prices and price guarantee</p> <p>Survey of existing fixtures, base cans, etc per L-125 Airfield lighting fixture manufacturer qualifications</p> <p>Identification/number markers 24 each samples of ID markers stamped "17L-35R"</p> <p>Reinforcing steel SS bolting hardware including anti-rotational devices Anti-seize compound</p>			

	<p>L-858B Runway Distance Remaining Sign – including as applicable: signs, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, sign tothers, SS anchor bolts, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-858Y, R, L Sign 1 Module Sign – including as applicable: signs, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, sign tothers, SS anchor bolts, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-858Y, R, L Sign 2 Module Sign – including as applicable: signs, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, sign tothers, SS anchor bolts, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-858Y, R, L Sign 3 Module Sign – including as applicable: signs, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, sign tothers, SS anchor bolts, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>L-858Y, R, L Sign 4 Module Sign – including as applicable: signs, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, sign tothers, SS anchor bolts, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals.</p> <p>Sign Conversion Kits Sign Panels</p> <p>Misc Sign Items L-858 sign message schedule Sign load calculation or test results supporting 200mph requirement per AC 150/5345-44F Vinyl die cut labels and sample</p> <p>L-867B Base Can L-867D Base Can L-858Y, R, L, B sign panels</p> <p>Spare Parts</p> <p>Non-reflective cracking fabric Epoxy bonding compound including pavement compatibility statement Rebar</p>			
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	<p>P-610</p> <p>All bolting hardware not previously submitted</p> <p>Each item submitted shall include the contractors proposed installation detail.</p> <p>All other components not previously listed or as requested by the RPR.</p>			
L-125	<p>Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item.</p> <p>Shop drawings of each component, indicating FAA approval, shall be submitted to the RPR for review and approval and be approved prior to ordering any materials for this item. This submittal shall include the proposed method of installation for all components. The submittal shall include data on all component parts of the item or system, and shall include the manufacturers list of recommended spare parts for one years use.</p> <p>Reinforcing steel SS bolting hardware including anti-rotational devices Anti-seize compound</p> <p>Runway End Identifier Lights (REILS) Precision Approach Path Indicator (PAPI) Wind Cones</p> <p>Apron Floodlighting Automatic Weather Observing System</p> <p>Pavement surface sensors, splice kits, manuals, manufacturer instructions, etc.</p> <p>Junction Boxes, enclosures, bases, etc. Disconnect switches, cabinets, wiring devices, etc. Concrete foundations, mounting rack, hardware, frangible couplings, floor flanges, rebar, etc. Terminal strips, connections, grounding equipment, etc.</p> <p>All other components not previously listed or as requested by the RPR.</p>			

END OF ITEM L-106