Black text – from standard FAA spec	Blue text – additions to FAA standard spec
~~Strikeout text~~ – deletions from FAA standard spec	Red text – notes to the Engineer/won't appear in spec

I. DESCRIPTION

A. GENERAL

1. Consists of furnishing and installing power cables within conduit or duct banks.
2. The Electrical Contractor and Job Superintendent shall have verifiable five years minimum of airfield electrical construction experience.

II. EQUIPMENT AND MATERIALS

A. GENERAL

1. Airport lighting equipment covered by (FAA) specifications shall be approved
2. All other equipment shall be subject to acceptance
3. Manufacturer's certifications shall not relieve the Contractor
4. All materials and equipment used to construct this item shall be submitted
5. The data submitted shall be sufficient
6. All equipment under this section shall be guaranteed for twelve (12) months

B. CABLE

1. Underground cable for airfield lighting shall conform to AC 150/5345 7
2. ~~Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Federal Specification J-C-30 and shall be type THWN 2~~ Underground cable for airfield lighting circuits shall be single conductor No. 8 AWG or No. 6 AWG cable with 5,000 volt, cross-linked polyethylene insulation suitable for wet and dry locations.
3. Other cable type, size, number of conductors, strand and service voltage shall be as specified on the plans.

C. BARE COPPER WIRE (COUNTERPOISE OR GROUND) AND GROUND RODS

1. Wire for counterpoise or ground installations shall conform to ASTM B3 and B8.
2. The Contractor shall install a continuous electrical grounding system throughout
3. Ground rods shall be constructed of copper

D. CABLE CONNECTIONS

1. In-line connections of underground primary cables shall be
   a) ~~The Cast Splice.~~
   b) Field attached Plug in Splice.
   c) The Factory Molded Plug in Splice.
   d) ~~The Taped or Heat-Shrinked Splice.~~
2. SPLICER QUALIFICATIONS
   a) Every airfield lighting cable splicer shall be qualified
3. CONCRETE
   a) Concrete for cable markers shall conform to Specification Item P-610,
4. ~~FLOWABLE BACKFILL~~
5. CABLE IDENTIFICATION TAGS
   a) ~~Cable identification tags shall by made from a non-corrosive~~ Cable identification tags shall be copper, circular in shape two (2) inches in diameter
6. TAPE
   a) Electrical tapes shall be Scotch Electrical Tapes
7. ELECTRICAL COATING
   a) Scotchkote or approved equivalent.
8. EXISTING CIRCUITS
   a) the circuit's insulation resistance shall be tested

III. CONSTRUCTION METHODS

A. GENERAL

1. All cable required to cross under pavements shall be installed encased duct banks.

2. Cable connections between lights will be permitted only at the light locations
3. L-823 cable connectors shall be installed at locations shown on the plans.
4. Provide not less than ~~3~~ five (5) feet of cable slack on each side of all connections
5. Each new field lighting cable shall be permanently tagged
6. Work shall consist of furnishing and installing new cables, or removing and reinstalling existing cables
7. All primary cable and secondary wiring shall be made by means of factory-attached plug-in connector kits

B. INSTALLATION IN NEW DUCT BANKS OR CONDUITS
1. installation of the cable in duct banks or conduit
2. The Contractor shall make no connections or splices of any kind in cables
3. Unless otherwise designated in the plans, use the lowest ducts to receive the cable first.
4. Duct banks or conduits shall be installed as a separate item
5. The manufacturer's minimum bend radius shall apply.
6. Cable shall not be dragged across base can or manhole edges, pavement or earth.

C. INSTALLATION OF NEW CABLES IN EXISTING OCCUPIED CONDUIT
1. Existing cable(s) occupying existing conduit in which new cable is to be added shall be disconnected and pulled back to the new cable pulling point.
2. The contractor shall furnish all necessary equipment, materials and labor for testing the underground cable circuits after installation.

D. ~~**108-3.3 INSTALLATION OF DIRECT BURIED CABLE IN TRENCHES**~~

E. ~~**108-3.4 CABLE MARKERS FOR DIRECT BURIED CABLE.**~~

F. SPLICING
1. Connections shall be made by experienced personnel engaged five (5) years
   ~~a)~~ ~~Cast Splices.~~
   b) Field attached Plug in Splices
   c) Factory Molded Plug in Splices
   ~~d)~~ ~~Taped or Heat-Shrinked Splices~~

G. BARE COUNTERPOISE WIRE INSTALLATION FOR LIGHTNING PROTECTION AND GROUNDING
1. Install a continuous electrical grounding system throughout
2. Bare counterpoise copper wire shall be installed
3. The counterpoise wire shall be routed to each light fixture base
4. The counterpoise system shall be continuous
5. Separate equipment ground system shall be provided
   a) A ground rod installed each light fixture base.
   b) Install an insulated equipment ground conductor internal to the conduit
6. Counterpoise Installation
   a) Counterpoise wires shall be installed above multiple conduits/duct banks
   b) duct banks under pavement, the counterpoise shall above the duct bank.
7. Counterpoise Installation at Existing Duct Banks
   a) New counterpoise wiring shall be terminated at ground rods

H. EXOTHERMIC BONDING
1. Bonding of counterpoise wire shall be by the exothermic welding process.
2. Contractor shall demonstrate the welding kits, to be used for welded connections
3. All galvanized coated surface areas and "melt" areas, shall be restored.
4. All buried copper and weld material at weld connections shall be thoroughly coated

I. TESTING
1. The Contractor shall furnish all necessary equipment and appliances.
2. ~~Earth resistance testing methods shall be submitted to the Engineer for approval~~
3. Megger existing cable circuit prior to installation of new cables.
4. The Contractor shall test grid conductors for continuity
5. After installation, the Contractor shall test and demonstrate the following:
   a) Lighting power and control circuits free from short circuits.

b) Circuits free from unspecified grounds.
c) Insulation resistance series circuits is not less than 50 megohms.
d) Insulation resistance of new multiple circuits is not less than 50 megohms.
e) Circuits (existing and new) are properly connected
f) Circuits (existing and new) are operable.
g) Impedance to ground of each ground rod does not exceed 25

6. Two copies of tabulated results of all cable tests
7. There are no approved "repair" procedures for items that have failed testing other than complete replacement.

IV. MATERIAL REQUIREMENTS

A. AC 150/5345-7
B. AC 150/5345-26
C. A-A-59544
D. FED SPEC A-A-55809
E. ASTM B 3
F. ASTM D 4388

V. REFERENCE DOCUMENTS

A. NFPA NO. 70
B. MIL-S-23586C
C. ANSI/IEEE STD 81

VI. METHOD OF MEASUREMENT

A. Shall be measured by the number of linear feet of cable or counterpoise wire installed in trenches, duct bank or conduit, including ground rods and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory
B. ~~Cable and counterpoise slack is considered incidental to this item~~

VII. BASIS OF PAYMENT

A. Payment will be made at the contract unit price for trenching, cable and bare counterpoise wire installed in trench (direct-buried), or cable and equipment ground installed in duct bank or conduit
B. Payment will be made under:
1. ~~Item L-108-5.1 Trenching for direct-buried cable – per linear foot~~
2. Item 69.1 L824 Cable, 1/C # [8 or 6] AWG, 5000 kV, Type C in [Duct] [or] [Conduit] - per linear foot
3. Item 69.2 1/C, Green #6 AWG Type THWN Ground Wire - per linear foot
4. Item 69.3 Bare Copper, #6 AWG Counterpoise Ground Wire - per linear foot
5. ~~Item L-108-5.3 Bare Counterpoise Wire~~
6. ~~Item L-108-5.4 Bare or insulated equipment ground~~

END OF SECTION