

Section 70 – Airport Transformer Vault and Vault Equipment
(FAA L-109)

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. This item shall consist of constructing an airport transformer vault or a prefabricated metal housing

II. EQUIPMENT AND MATERIALS

A. GENERAL

1. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA).
2. other equipment covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance.
3. Manufacturer's certifications shall not relieve the Contractor of the Contractor's responsibility to provide materials in accordance with these.
4. All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment.
5. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications.
6. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner.

B. CONCRETE

1. The concrete for the vault shall be proportioned, placed, and cured in accordance with Item P-610.

C. REINFORCING STEEL

1. Reinforcing steel bars shall be intermediate or structural grade deformed-type bars and shall meet the requirements of ASTM A 615.

D. BRICK

1. Brick shall conform to ASTM C 62, Grade SW.

E. RIGID STEEL CONDUIT

1. Rigid steel conduit and fittings shall be in accordance with Underwriters Laboratories Standard 6 and 514.

F. LIGHTING

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1. Vault or metal-housing light fixtures shall be of a vaporproof type.

G. OUTLETS

1. Convenience outlets shall be 20A, heavy-duty duplex units.

H. SWITCHES

1. ~~Vault or metal-housing light switches shall be single-pole switches.~~ Light or fixture switches shall be heavy-duty single-pole unit.

I. PAINT

1. Priming paint for ungalvanized metal surfaces shall be a high solids alkyd primer.
2. White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint.
3. Priming paint for wood surfaces shall be mixed on the job by thinning the.
4. Paint for the floor, ceiling, and inside walls shall be in accordance with Fed. Spec.
5. The roof coating shall be ~~hot asphalt material in accordance with ASTM D 2823~~ a thermo plastic membrane type roofing.

J. HIGH VOLTAGE BUS

1. High-voltage bus shall be standard.

K. BUS CONNECTORS

1. Connectors shall be similar to Burndy Type NT for copper tubing.

L. BUS SUPPORTS

1. Bus supports shall be similar to Westinghouse.

M. GROUND BUS

1. Ground bus shall be 1/8 - x 3/4-inch (3 x 18 mm) minimum copper bus bar.

N. SQUARE DUCT

1. Duct shall be square similar to that manufactured by the Square D.

O. GROUND RODS

1. Ground rods shall be copper or copper-clad of the length and diameter specified in the plans.

~~P.~~ POTHEADS

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1. ~~Potholes shall be similar to G&W Type N, Shape C.~~

Q. PREFABRICATED METAL HOUSING

1. The prefabricated metal housing shall be a commercially available unit.

R. EMERGENCY GENERATORS

1. Emergency generators shall be diesel powered.

S. CONSTANT CURRENT REGULATORS

1. Constant Current Regulators (CCR) shall conform to the requirements of FAA.
2. Constant Current Regulators shall be: Type L-829, Regulator.
3. Provide integral multi step local control switch.
4. Constant Current Regulator minimum input power factor shall be 95 percent.
5. Constant Current Regulator minimum efficiency shall be 90 percent.
6. The regulators shall be suitable for remote control.
7. Provide with interface for the ALCMS from remote locations..
8. Install floor mounted regulators within the Airfield Lighting Vault at the locations indicated.
9. Install and adjust in accordance with manufacturers' requirements.
10. Demonstrate the operation of all features of the system.

T. FAA-APPROVED EQUIPMENT

1. Certain items of airport lighting equipment installed in vaults are covered by individual FAA equipment specifications. The specifications are listed below:
 - a) AC 150/5345-3
 - b) AC 150/5345-5
 - c) AC 150/5345-7
 - d) AC 150/5345-10
 - e) AC 150/5345-13

U. OTHER ELECTRICAL EQUIPMENT

1. Constant-current regulators, distribution transformers, ~~oil switches~~, cutouts, relays, terminal blocks, transfer relays, circuit breakers and emergency generators.

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V. WIRE

1. Wire in conduit rated up to 5,000 volts shall conform to AC 150/5345-7.
2. Control Circuits
 - a) Unless otherwise indicated on the plans, wire shall be not less than No. 12 AWG.
3. Power Circuits.
 - a) 600 volts maximum-Wire shall be No. 6-12 AWG or larger and insulated for at least 600 volts.
 - b) ~~3,000 volts maximum-Wire shall be No. 6 AWG or larger and insulated for at least 3,000 volts.~~ Over 600 volts-Wire shall be No. 8 AWG or larger and insulated for at least the circuit voltage.
 - c) ~~Over 3,000 volts-Wire shall be No. 6 AWG or larger and insulated for at least the circuit voltage.~~

III. CONSTRUCTION METHODS

A. GENERAL

1. The Contractor shall construct the transformer vault or prefabricated metal housing at the location indicated in the plans.

B. FOUNDATION AND WALLS

1. Reinforced Concrete Construction
 - a) The Contractor shall construct the foundation and walls in accordance with the details shown in the plans.
2. ~~Brick and Concrete Construction~~
3. Concrete Masonry Construction
 - a) When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the plans.

C. ROOF

1. The roof shall be corrugated metal with reinforced concrete as shown in the plans.

D. FLOOR

1. The floor shall be reinforced concrete as shown in the drawings.

E. FLOOR DRAIN

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1. ~~If shown in the plans,~~ A floor drain and sump pump well shall be installed in the center of the floor of the equipment room

F. CONDUITS IN FLOOR AND FOUNDATION

1. Conduits shall be installed in the floor and through the foundation walls in accordance with the details shown in the plans.

G. DOORS

1. Doors shall be metal-clad fireproof class a doors conforming to requirements of the National Electric Code and local electrical codes.

H. PAINTING

1. The floor, ceiling, and inside walls of concrete construction shall first be given a hardening treatment, after which the Contractor shall apply two coats of paint as specified.

I. LIGHTS AND SWITCHES

1. The Contractor shall furnish and install a minimum of ~~two~~ four duplex convenience outlets in the vault room.

J. EMERGENCY GENERATOR

1. The Contractor shall furnish and install Emergency Generator as specified on the plans.

K. TESTING

1. The Contractor shall furnish all necessary equipment and appliances for testing the vault electrical systems and circuits before and after installation.

IV. INSTALLATION OF EQUIPMENT IN VAULT OR PREFABRICATED METAL HOUSING

A. GENERAL

1. The Contractor shall furnish, install, and connect all equipment, equipment accessories, conduit, cables, wires, buses, grounds, and support necessary to insure a complete and operable electrical distribution center for the airport lighting system as specified herein and shown in the plans.

B. POWER SUPPLY EQUIPMENT

1. Transformers, regulators, booster transformers, and other power supply equipment items shall be furnished and installed at the location shown in the plans or as directed by the Engineer.

C. SWITCHGEAR AND PANELS

1. ~~Oil switches,~~ Fused cutouts, relays, transfer switches, panels, panel boards, and other similar items shall be furnished and installed at the location shown in the plans or as directed by the Engineer.

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D. DUCT AND CONDUIT

1. ~~The Contractor shall furnish and install square type exposed metallic ducts with hinged covers for the control circuits in the vault.~~ Rigid Metal Conduit shall be installed in the walls and concrete wherever possible.

E. CABLE ENTRANCE AND HIGH-VOLTAGE BUS SYSTEM

1. Incoming underground cable from field circuits and supply circuits will be installed outside the walls of the transformer vault as a separate item under Item L-108.

F. WIRING AND CONNECTIONS

1. The Contractor shall make all necessary electrical connections in the vault in accordance with the wiring diagrams furnished and as directed by the Engineer

G. MARKING AND LABELING

1. All equipment, control wires, terminal blocks, etc., shall be tagged, marked, or labeled as specified below:

H. Wire Identification

1. The Contractor shall furnish and install self-sticking wire labels or identifying tags on all control wires at the point where they connect to the control equipment or to the terminal blocks.

I. Labels

1. The Contractor shall stencil identifying labels on the cases of regulators, breakers, and distribution and control relay cases with ~~white oil paint as designated by the Engineer~~ metal, non-corrosive nameplates.

V. METHOD OF MEASUREMENT

1. ~~See Section 69-2~~ The quantity of vaults to be paid for under this item shall consist of the number of vaults constructed in place and accepted as a complete unit.
2. ~~109-4.2~~ The quantity of prefabricated metal housings to be paid for under this item shall consist of the number of housings constructed in place and accepted as a complete unit.
3. ~~109-4.3~~ The quantity of vault or prefabricated metal housing equipment to be paid for under this item shall consist of all equipment installed, connected, and accepted as a complete unit ready for operation.

VI. BASIS OF PAYMENT

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1. ~~See Section 69-3. Payment will be made at the contract unit price for each completed and accepted vault or prefabricated metal housing equipment installation. 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 to complete the item.~~
2. Payment will be made under:
 - ~~Item L-109-5.1~~
 - ~~Item L-109-5.2~~
 - ~~Item L-109-5.3~~
 - ~~Item L-109-5.4~~

VII. MATERIAL REQUIREMENTS

- A. AC 150/5345-7
- B. AC 150/5345-26
- C. FED SPEC J-C-30
- D. FED SPEC A-A-55809
- E. ASTM B 3
- F. ASTM D 4388

VIII. REFERENCE DOCUMENTS

- G. NFPA No. 70
- H. MIL-S-23586C
- I. ANSI/IEEE Std 81

END OF ITEM L-109