Special Specification 6074
Communication Cabinet

1. DESCRIPTION

Furnish and install communication cabinet to include the installation of the foundation, cabinet, and all necessary associated electrical and mechanical devices. These cabinets will house the various types of communication and control equipment required for the system as shown on the plans. This equipment may include:

- Lane Control Signal (LCS) Controller Units
- Surveillance Loop Detectors termination point
- Field Telephone Unit
- Local Control Units
- Communication Modem
- Ramp Meter Control Panel
- Closed Circuit Television Control Receiver and Fiber Optic Video Transmitter
- Drop/Insert Multiplexor/Demultiplexor
- Data Fiber Optic Transceivers
- Modular Fiber Distribution Housing
- Subrate Data Multiplexor Distribution Panel
- CCTV Color Video Compression System (CVCS)

Provide and install all necessary wiring, harnesses and cable assemblies as directed.

2. MATERIALS

Use materials that meet the requirements for the following Item:

- Item 656, “Foundations for Traffic Control Devices.”

3. CABINET DESIGN AND REQUIREMENTS

Submit all shop drawings of the cabinet and cabinet wiring diagrams to the Engineer for approval before installations.

Provide a base mount cabinet with the following external dimensions:

- Width -- 59 in.
- Height - 75 in.
- Depth -- 26 in.

The height and depth dimensions may be ± 2 in. Provide four 3/4 in. (minimum) by 8 in. galvanized anchor bolts with nuts and washers and a mounting template for each cabinet.

Construct the cabinet using unpainted sheet aluminum with a minimum thickness of 0.1875 in. Ensure material used in the cabinet meets NEMA standards.

Weatherproof the cabinet to prevent the entry of water. Continuously weld all exterior seams for cabinet and doors. Smooth all exterior welds. Permanently attach or built aluminum lifting eyes or ears into the cabinet to permit lifting the cabinet with a sling.

Provide vertical shelf support channels to permit adjustment of shelf location in the field.

Equip each cabinet with an extra set of keyhole struts on either side of the front section of the cabinet to permit the mounting of additional equipment as necessary.

Equip the cabinet with 3 adjustable, removable shelves. Ensure the shelves be at least 10-1/2 in. deep and be located in the cabinet to provide a 1/2 in. clearance between the back of the shelf and the back of the cabinet.

Fit the bottom shelf with a slide out work table. The table will be 14 in. wide and will have a 10 in. minimum extension. The table will be of 0.125 in. thick aluminum with rolled edges for rigidity and will lock in the extended position.

Equip the cabinet with two interconnection panels. Each panel will have 4 25 pair punch down terminal blocks (S66M1-50 with Quick clip style 571), uniquely marked with a silk screen diagram or permanent stencil as shown on the plans. Include circuit breakers, grounding bar, radio interference filters, lightning arrestors, fans and fluorescent lighting in the cabinet.

Provide the cabinet with 2 doors in front and 2 doors in back that will provide access to the cabinet. Provide each door with 5 hinges, or a full length stainless steel piano hinge, with stainless steel pins spot welded at the top. Mount the hinges so that it is not possible to remove them from the doors or cabinet without first opening the doors. Place a removable center support in the middle of each set of doors to ensure cabinet rigidity.

Brace the doors and hinges to withstand a 100 lb. per vertical foot of door height load applied vertically to the outer edge of the door when standing open. There will be no permanent deformation or impairment of any part of the door or cabinet body when the load is removed. Design two retainers (top and bottom) to hold the door open at approximately 90 degree and 180 degree positions.

Fit the cabinet doors with Number 2 Corbin locks and aluminum or chrome plated handles with a 3/8 in. (minimum) drive pin and a three point latch. The lock and latch design will be such that the handle cannot be released until the lock is released. Provide the handle with a locking ring so a padlock can be installed in addition to the Corbin lock. Provide two keys for each cabinet. Locate the lock to be clear of the arc of the handle.

Provide a gasket to act as a permanent dust and weather resistant seal at the controller cabinet door facing. The gasket material will be of a non-absorbent material (rubber) and will maintain its resiliency after exposure to the outdoor environment.

The gasket will have a minimum thickness of 3/8 in. and will be located in a channel provided for this purpose either on the cabinet or on the door. A channel formed by an “L” bracket and the door lip is acceptable. In any case the gasket must show no sign of rolling or sagging and must insure a uniform dust and weather resistant seal around the entire door facing. Any other method must be approved by the Engineer.

Vent and cool the cabinet by a thermostatically controlled fan. Provide adjustable thermostat with an adjustment range of 70°F to 110°F. Provide a press-to-test switch to test the operation of the fan.

Provide commercially available fan with a capacity of at least 200 cfm. Provide the intake for the vent system with a 16 in. (wide) by 12 in. (high) by 1 in. (thick) air conditioning filter, and the filter securely mounted so that any air entering the cabinet must pass through the filter. Ensure the cabinet opening for intake of air will be large enough to use the entire filter. Screen the exhaust to prevent entry of insects. Provide the screen openings no larger than 0.0125 sq. in. Provide the total free air opening of the vent large enough to prevent excessive back-pressure on the fan.

Provide the cabinet with a unique 5-digit serial number which will be stamped directly on the cabinet or engraved on a metal or metalized mylar plate riveted with aluminum rivets to the cabinet. The digits will be at least 0.5 in. in height and located on the upper right sidewall near the front of the cabinet.

Provide a 5/8 in. diameter X 8 ft. copper clad steel ground rod in the foundation of each communication cabinet. Provide copper ground buses for both the power supply neutral (common) and chassis ground. Provide each bus bar a minimum of 10 unused terminals with 8-32 X 5/16 in. or larger screws. Do not jump the AC neutral and chassis ground buses together. Isolate the logic ground from the AC neutral and terminated on a logic ground bus sufficient to accept 20 number 20 AWG stranded wires.

Unless otherwise shown on the plans, mount and wire 6 circuit breakers in the cabinet. Use one 20 ampere breaker to protect the fluorescent light, GFCI-protected duplex receptacle, and fan. Use the second 20 ampere breaker to protect the Lane Control Signals. Use the third 20 ampere breaker to protect the local control units, communication modem, and two duplex receptacles. Use the fourth 20 ampere breaker to protect the CCTV system and a duplex receptacle. Use the fifth 20 ampere circuit breaker to protect the drop/Insert Muldem and a duplex receptacle. Use the sixth 20 ampere circuit breaker to protect the regulated linear power supply. Provide Square “D” QOU 150 series, GE THQC 1150 l series, or equivalent breaker(s). Equip the circuit breaker(s) with solderless connectors and install them on the sidewall or lower right hand side of the back panel inside the cabinet in such a manner that their rating markings are visible and the breaker is easily accessible.

All 5 duplex receptacles of a 3-wire grounding type which will accept a standard 2-pronged non-grounding plug, will be mounted and wired in the cabinet. Wire these receptacles on the “Load” side of the 20 ampere breaker. Install the duplex receptacles with 4 in. minimum center to center clearance horizontally and 5 in. minimum center to center clearance vertically.

Protect the line side of all circuit breakers with an EDCO Model SPA-300, Davis Engineering Model DE-300 or equivalent (Lightning arrestor). Use number 10 AWG or larger wires to connect the suppressor into the circuit.

Install a 15 watt fluorescent light, with switch, in the cabinet. This light will turn on when the cabinet door is opened, and turn off by means of a door switch when the door is closed. Provide a switch to turn off any incandescent display that may be used in a controller unit or other equipment.

Except where soldered, provide all wires with lugs or other terminal fittings as approved for attachment to binding posts. Insulation parts and wire insulation will be insulated for a minimum of 600 volts.

Install foundation according to the plans. The foundation, except for measurement and payment, will be in conformance with Item 656, “Foundations for Traffic Control Devices”, unless otherwise directed.

The conduit arrangement will be as shown on the plans. Place all wiring in a neat and orderly manner and grouped together with nylon tie-downs.

To insure uniformity within the cabinet, assign termination points for the 12, 25 and the 50 pair cables with color scheme as adopted by Western Electric Telephone standards.

Provide each pair of connectors for the 12, 25 and 50 pairs with a lightning arrestor such as LXSCP-1, 600V, 350MA.

Provide a clear 1/8 in. thick removable cover made from Lexan to cover the power panel and power input terminal boards. This cover will be mounted with brackets or screws, and should not interfere with any conduit, wiring, or functional operation within the cabinet.

Mount and wire a regulated linear power supply in the cabinet that meet the following requirements:

- AC input - 115 VAC ± 10%, 60 Hz ± 3 Hz.
- Regulated voltage output - 24 VDC ± 5% minimum adjustment range.
- Line regulation - ± 0.05% up to 10% line change.
- Load regulation - ± 0.05% for up to 50% load change.
- Output ripple - 3 mV ± 0.02% peak to peak.
- Output current - 7.2 amperes at 50°C.

- Overshoot - No overshoot at turn-on, turn-off, or power failure.
- Operating temperature range - continuous duty from 0°C to 60°C.
- Input and output connections - terminal block on front of chassis contains all terminals for AC input, DC output and ground connections.
- Efficiency - 60% minimum.
- Dimension - 14 in. W X 5 in. H X 3 in. D maximum and will not weigh more than 10 lb.

Fuse the input and output power properly and ensure the unit has automatic short circuit, overcurrent and overvoltage protections. Cool the unit convectionally with no external blower required.

In each communication cabinet, provide 2 back panels, as shown on the plans, containing lane control signal load switches, terminal strips and permanent labeling of all connections as shown on the plans. Fabricate the back panel from 1/8 in. sheet aluminum. Punch all openings in the panel neatly and finish all edges smooth. Locate terminal strips for power supply and grounding on the right side of the back panel. Protect all exposed power terminals by clear Lexan cover(s).

Silk screen all markings and identification on the panel and seal with a clear sealer, acrylic or as approved.

All terminal strips used in the communication cabinets will be a through panel design with 0.250 size flat blade quick connect insulator bases. The terminal strips will have the appropriate number of positions to minimize the number of terminal strips required for back panel fabrication.

Provide responsibility for all data, control, power and confirmation connections on the back panels and for fabrication of any required wiring harnesses.

Provide each cabinet with waterproofed fused and unfused breakaway connectors. Provide the fused breakaway connector in the line connector (hot wire). Provide the neutral wire with an unfused breakaway connector. Install the breakaway connectors prior to the main power panel of the cabinet or as directed.

Provide the cabinet with an equipment rack secured to the middle shelf as shown on the plans. Mount the rack to provide 1.5 in. minimum cable clearance between the rack and the rear cabinet wall.

Provide the equipment rack to accommodate standard 19 in. rack mounted chassis units (e. g. CCTV equipment, D/I muldem, CVCS, etc.) as shown on the plans. Ensure the equipment rack dimensions are 15 in. deep and it provides 24 in. of vertical rack space.

Provide the equipment rack to include front and rear mounting rails tapped on EIA universal spacing for 10 - 32 bolts.

4. MEASUREMENT

This Item will be measured by the each for each communication cabinet complete in place.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Communication Cabinet" of the size specified. This price will be full compensation for all equipment described under this item including cables, connectors, foundation, documentation, and for furnishing all labor, materials, tools, equipment, and incidentals.