Special Specification 5080
Vertical Barrier Gate

1. DESCRIPTION

Furnish and install vertical barrier gates in designated field locations as shown on the drawings and as detailed in these Specifications.

2. MATERIALS

2.1 **General Requirements.** Furnish, assemble, fabricate, and install new, corrosion resistant materials under this item in accordance with these specifications. The vertical barrier gate includes, but is not limited to the following:

- Gate foundation,
- Gate arms and other mechanical support and structure,
- Motor and associated mechanical and electro-mechanical drives and gears,
- Gate controller,
- Control relays and limit switches,
- Gate operator housing for control components, and
- All other components to make gate fully operational.

2.2 **Functional Requirements.**

Provide a barrier gate that is a vertical rising type, motor operated, and gear driven. Make the length of the gate as required to block the roadway as shown on the plans.

Design the entire gate assembly and the driving mechanism to meet the requirements of the codes applicable to this type of equipment. Design the gate to withstand a wind speed of 100 mph.

2.2.1 **Operation.** The gate will remain closed unless opened by a bus passing over a detection loop shown on the plans. Provide a safety loop located near the gate to prevent the gate from closing if a vehicle is detected under the gate. Ensure the safety loop does not open the gate if it is already fully closed.

2.3 **Electrical Requirements.**

2.3.1 **Drive Motor.** Provide a gate arm driven by a torque motor operating from single phase 115 VAC, 60 Hz, and size the power rating according to the gate arm length. Design the vertical gate arms to remain in their current position when a complete power failure occurs.

2.3.2 **Gate Controller.** Provide a gate controller to open and close the gate as shown on the drawings and specified below. Install the gate controller in the gate cabinet housing. Provide a by-pass switch to override the automatic controls to open the gate. Fasten a by-pass switch to the cabinet. Provide a two-position by-pass switch ON-OFF selector switch NEMA Type 4/13, watertight, oil-tight, maintained position, key operated, key removable in the left position, Auto-Open and Padlocking Cover. Provide 5 keys that operate existing vertical gates switches.

2.3.3 **Limit Switch.** Provide a gate limit switch unit assembly containing a minimum of one individual switch having one set of normally open and one set of normally closed contacts. Contacts must be totally enclosed and have a minimum U.L. rating of 15 amperes at 220 V AC. Provide a limit switch that is readily accessible and easily replaced with normal hand tools. Ensure each individual switch is controlled by an independent cam. Bring the wiring to the limit switch out to a screw barrier terminal strip mounted inside the gate housing. Fabricate the limit switch body, shafts, and cams of corrosion resistant non-ferrous materials.

2.3.4 **Wiring.** Route wires entering and exiting the gate housing via terminal blocks in the housing and through openings in the concrete foundation. Properly ground the gate housing with an 8 ft. x 5/8 in. copper rod. Provide wiring that meets the requirements of the National Electric Code. Cut wires to proper length before assembling. Do not double back wire to take-up slack. Neatly lace wires into cables with nylon lacing or plastic straps. Secure cables with clamps.

2.3.5 **Protection.** Protect equipment against overloads and short circuits with fuses or circuit breakers sized so no wire, component, connector, pc board or assembly is subject to sustained current in excess of their respective design limits upon failure of any circuit element of wiring.

2.4 **Mechanical Requirements.**

2.4.1 **Gate Arm.** Provide the length of the gate arms required to block the entire roadway. Fabricate each gate of tubular aluminum alloy and with a minimum 5 in. high surface area facing traffic. Cover the gate arm with reflective diamond grade sheeting of alternating red and white stripes of 24 in. width and with a rubber cushion to protect cars from damage (rubber bumpers). Provide each gate with pendulum supports coated in white and provided with reflective red film stripes facing the road on opposite sides. Provide the number of supports required as recommended by the manufacturer for the length of arm provided. Provide a gate arm driven by a torque motor which requires no V-belts, chains or friction clutches. Ensure the transmission mechanism is removable as a single unit. Equip shafts protruding from gear boxes containing oil with dual oil seals. Provide a safety feature so that if the gate arm comes in contact with an object during the closing cycle; sufficient non-destructible pressure causes the gate arm to stall without damage to the motor or gearing and allows normal operation to resume once the object is removed. Ensure that upon impact the arm separates from the operator with minimal damage to both.

2.4.2 **Spare Parts.** Provide 4 complete spare sets of gate arm mounting brackets and hardware for each gate. Enclose each set in a separate waterproof plastic envelope labeled to indicate the gate brand, model, and envelope contents. Provide one spare gate arm, complete with markings for each gate. Label each gate arm to indicate the gate brand/model and arm length. Deliver the spare parts to Felicano Gonzalez at METRO's Field Service Center, 1215 Labco Street, Houston, Texas.

2.4.3 **Gate Housing.** Provide a weather proof gate housing enclosure fabricated with galvanized phosphate-treated sheet steel and a steel frame. Provide housing with the manufacturer's standard finish. Install the gate housing on a concrete foundation in accordance with the manufacturer's specification.

3. CONSTRUCTION

3.1 **General.** Provide new vertical gate materials and associated equipment that are standard products of a manufacturer specializing in barrier gates. Make the component parts readily accessible for inspection and maintenance.

3.2 **Installation.** Install the vertical barrier gate in accordance with the gate manufacturer's written installation instructions and as indicated on drawings.

3.3 **Testing.** Test the equipment for proper operation. Correct any malfunctions and retest the equipment. Retest and correct equipment retested and corrected until passing the test.

3.4 **Documentation and Training.** Furnish 2 complete sets of documentation covering theory of operation, maintenance, and system as-built drawings for each component installed. Include with maintenance manuals, complete parts lists, parts sources, and schematic diagrams adequate for component level repair of electronic devices. Provide original manuals. Provide reproducible 22in. x 34in. double matte mylar drawings. After installation is complete, coordinate a meeting with METRO maintenance and operations personnel to demonstrate operating and programming procedures for the equipment. Schedule this meeting to take place before final acceptance of the equipment. Upon acceptance of the equipment turn the keys over to METRO.

4. MEASUREMENT

This item will be measured by the each vertical barrier gate, complete in place in the locations shown on the plans.

5. PAYMENT

The work performed, materials, and supplies furnished in accordance with this item and measured as provided under “Measurement” will be paid at the unit price bid for “Vertical Barrier Gate.” This price is full compensation for ordering, transporting, unloading, fabricating, erecting, placing, and for equipment, labor, tools, and incidentals.