

SECTION 18330

SWITCH CIRCUIT CONTROLLER

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Section includes requirements for switch circuit controllers.

1.02 GENERAL

- A. Switch circuit controller layouts shall include the controller unit, junction box, point lug, detector rod, shims, all required bolts, nuts, washers, pins, grease fittings, cotter keys, plates, adjusting brackets, and all hardware to mechanically couple the switch circuit controller to the track switch points and mount it on the ties.
- B. Refer to Division 19, Trackwork, for track construction requirements.

1.03 REFERENCE STANDARDS

- A. American Railway Engineering and Maintenance of Way Association (AREMA):
 - 1. Communications and Signals Manual of Recommended Practices (C&S Manual).

1.04 SUBMITTALS

- A. Submit installation drawings showing the tie straps and the mounting details of the switch circuit controller, including the connections to the track switch points.
- B. Submit Contractors Acceptance Test Documentation on switch circuit controllers prior to transport.
- C. Submit copies of all field-test reports.

1.05 QUALITY ASSURANCE

- A. Switch circuit controllers shall meet the recommendations of AREMA C&S Manual, Part 12.1.1, for a four front/back contact configuration where they do not conflict with any requirements specified herein. Mounting details shall conform to the Caltrain Design Standards.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect switch circuit controllers and their component layout parts against damage during handling and shipment.
- B. During storage, properly lubricate and maintain switch circuit controller layouts on a regular timed program.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Furnish Electric Switch Circuit Controller Layout complete with rod, lug, and associated hardware.
- B. Contractor furnished Switch Circuit Controllers and layouts, if required, shall be: Model 7J as manufactured by Alstom Signaling, Model U-5 as manufactured by Union Switch and Signal (now Ansaldo), or Engineer approved equal, complete with rod, lug and associated hardware.
- C. Contractor furnished Junction Box shall be Model 091 428-ABX manufactured by Safetran Systems (now Invensys) or Engineer approved equal.
- D. Furnish Insulated Vertical No. 1 Rod with Basket.
- E. Miscellaneous Fittings: Furnish all connectors such as threaded nipples, cable clamps, and electrical fittings as required for each switch and lock movement layout including 18-inch-long, two-inch-diameter flexible conduit and connectors from movement to junction box.

2.02 GENERAL

- A. Stranded wire: Furnish insulated No. 10 AWG stranded wire between the pedestal-mounted junction box and the switch circuit controller. Insulated wire shall be in accordance with Section 18370, Signal Wire and Cable.
- B. Miscellaneous Fittings: Furnish all connectors such as threaded nipples, cable clamps, and electrical fittings as required for each switch circuit controller layout.

2.03 SECURITY

- A. Padlocks will be Owner-furnished.

2.04 SOURCE QUALITY CONTROL

- A. Test each switch circuit controller before transporting it to the job site. Conduct this acceptance testing in accordance with the Contractor's Acceptance Test Procedure for switch circuit controllers.

PART 3 - EXECUTION

3.01 GENERAL

- A. Mount and adjust the complete switch circuit controller layout as specified herein and as indicated on the Contract Drawings.
- B. Circuits for switch circuit controllers shall be as shown on the Contract Drawings.

3.02 INSTALLATION

- A. Prior to installation, coat all parts of the switch circuit controller that are not painted or made of non-corroding material with an approved grease to prevent corrosion. Suitably plug or cap unused threaded outlets.
- B. Install one 10-foot long timber tie or concrete tie for mounting the controllers as shown on the Contract Drawings
- C. Mount controllers on new and existing timber or concrete ties in conformance to Caltrain Design Standards.
- D. Dap and drill timber ties to meet the requirements of these Specifications. Limit of cutting or dapping shall not exceed 2 inches.
- E. Secure the switch circuit controller to the switch ties, by 3/4 inch by 10 1/2 inch bolts.
- F. Remove any ballast necessary for the installation of each hand throw switch layout and replace and tamp the ballast after the installation has been completed. Spread excess ballast evenly between ties in the vicinity of the switch and lock movement layout.
- G. Make a preliminary adjustment of the controller layout at the time of installation and a final adjustment when placing it in service, which shall result in the adjusting nuts being centered on the threads plus or minus 30 percent of the thread length. Make final adjustment at the time of the functional test. Make final adjustments in conformance with the requirements of AREMA C&S Manual, Parts 12.1.1 and 2.4.1.
- H. Underground cable terminating in the controller junction box shall be dressed and potheaded as specified in Section 18370, Signal Wire and Cable. Fan the individual conductors in a neat workmanlike manner, properly tagged and terminated. Wiring between switch junction box and switch circuit controller shall be No. 10 AWG insulated stranded flex wire. These wires shall also be tagged and terminated. Install the wires between the controller junction box and the controller mechanism in an approved flexible conduit with a minimum length of 10 inches and a maximum length of 21 inches. Fasten this flexible conduit to the switch junction box and switch mechanism with appropriate connectors.
- I. After installation, properly lubricate and maintain switch circuit controller layouts on a regular timed program until accepted by the Engineer.
- J. Exercise care and ensure that the controllers, including switch tie plates, are thoroughly lubricated at all lubricating points, that all machined surfaces susceptible to rusting, both external and internal, are thoroughly coated with grease, as acceptable to the Engineer, and that threaded portions of switch rods and nuts are similarly coated and protected.
- K. Lubricate the switch tie plates with graphite lubricant, as acceptable to the Engineer. Thoroughly steam cleaned the plates to remove all oil or grease prior

to application of the graphite. Periodically renew the protective coating until such time as the Owner assumes responsibility for maintenance of the equipment.

- L. Connect switch circuit controller rods to the normally closed switch point.

3.03 SECURITY

- A. Install Owner-furnished switch padlocks on trainman's access side of electric locks and hand-throw levers of switch and lock movements.

3.04 TOUCH-UP

- A. Touch-up the finish of all equipment described in this Section in accordance with the AREMA C&S Manual, Part 1.5.10. Touch-up shall match factory finish.

3.05 FIELD QUALITY CONTROL

- A. Inspect each switch circuit controller after it has been installed and correct any deficiencies noted. Conduct this inspection in conformance with the requirements of the Contractor's Installation Inspection Procedure as accepted by the Engineer.
- B. Conduct final operational tests of switch circuit controllers as described in Section 18600, Signal Systems Testing.
- C. Test all functions of each switch and lock movement layout in accordance with Section 18600, Signal Systems Testing.

END OF SECTION