### SECTION 684 – LAYER 2 FIELD-HARDENED ETHERNET SWITCH

**DESCRIPTION**

**684.01.01 GENERAL**

***ADD THE FOLLOWING SUBSECTIONS:***

1. Supply an Field Hardened Ethernet Switch from the following list:
	1. Ruggedcom, RST916C or approved equal
2. In locations in the field that have equipment that require a serial interface supply a Ethernet switch that also includes a serial port.

G. At DMS locations the work of installing the field hardened Ethernet switch includes all work necessary to integrate the DMS sign into the Fiber optic system.

**MATERIALS/EQUIPMENT**

**684.02.01 FUNCTIONAL REQUIREMENTS**

**ADD THE FOLLOWING TO PARAGRAPH “B14” OF THIS SUBSECTION**

* 1. All equipment supplied and installed on this project shall be labeled clearly with the project and location designation.

***ADD THE FOLLOWING TO PARAGRAPH “B” OF THIS SUBSECTION:***

16. Physical Characteristics:

1. A minimum of 12 Ports, *10/100/1000* Base TX, RJ-45.
2. 4 Port, 1000 Base FX, SC.
3. Serial port (when needed)
4. The field switch shall not exceed 7.5" high x 3" wide or 5" deep.
5. The weight shall not exceed 5 Ibs.
6. Shelf mount in 19" standard equipment rack

17. Each Field Switch shall be delivered with a Three (3) Meter LC/LC Duplex 9/125 Singlemode Fiber Optic Patch Cable, and shall conform to the following specifications:

1. Connectors: (2) LC to (2) LC
2. Buffer material: PVC
3. Buffer OD: 900 µm
4. Jacket material: PVC (OFNR-rated)
5. Jacket OD: 3.0 mm
6. Jacket color: Yellow
7. Attenuation @1310 nm: 1.0 dB/km
8. Attenuation @1550 nm: 0.75 dB/km
9. Maximum tensile load: 100 N/cm
10. Loaded min. bend radius: 5 cm
11. Unloaded min. bend radius: 3 cm
12. Crush resistance: 750 N/cm
13. Impact resistance: 1000 cycles
14. Flex resistance: 5000 cycles

18. Testing requirements: Perform testing as required Subsection 105.03 and the following:

Perform the following tests for each Ethernet Switch installation:

1. SALT. Verify that after installation but prior to interconnection, the equipment operates as specified in the field. Test should Including the following:

a. The Ethernet Switch will be powered up and allowed to initialize, boot and run self- diagnostic tests as defined in the approved test procedures.

2. SST. For each Ethernet Switch location that is installed and interconnected in a system, conduct approved SSTs from the operator workstation that include the following:

1. All items in the stand-alone test
2. Transmission of data to the TMC
3. Response to all central software commands.

3. SAT. At least once per week, demonstrate that all Ethernet switches function as tested in the SST.

**METHOD OF MEASUREMENT**

* + 1. **MEASUREMENT**

***ADD THE FOLLOWING TO THIS SUBSECTION:***

The quantity of LAYER 2 FIELD-HARDENED ETHERNET SWITCH will be measured per each, delivered to the City and FAST.

The quantity of [FILL IN ITEM DESCRIPTION] will be measured per [UNIT].

No direct measurement shall be made for [FILL IN ITEM DESCRIPTION].

**BASIS OF PAYMENT**

**684.04.05 PAYMENT**

***ADD THE FOLLOWING PARAGRAPHS TO THIS SUBSECTION:***

The accepted quantity of LAYER 2 FIELD-HARDENED ETHERNET SWITCH will be paid for at the contract unit price of each and shall conform to the requirements of subsection 684.05.01 of the Uniform Standard Specifications and shall include all materials, equipment, labor and disposal required to perform this work and all work as shown on the Plans, as specified herein and as directed by the Engineer. The above payment shall also include, mounting hardware, cabling and network management software and must be delivered as a single shipment to FAST, with the Project’s name noted on the packaging.

The accepted quantity of [FILL IN ITEM DESCRIPTION] will be paid for at the contract unit price of [UNIT] and shall include all materials, equipment and labor required including, but not limited to, [FILL IN] and all other items necessary to complete the work as shown on the Plans, as specified herein and as directed by the Engineer.

The accepted quantity of [FILL IN ITEM DESCRIPTION] will be paid for at the contract unit price of [UNIT] and shall conform to the requirements of subsection 684.05.01 of the Uniform Standard Specifications and shall include all materials, equipment, labor and disposal required to perform this work and all work as shown on the Plans, as specified herein and as directed by the Engineer. The above payment shall also include,

Unless otherwise provided in the Special Provisions, no payment will be made for [FILL IN ITEM DESCRIPTION] as such. The cost thereof shall be considered as included in the price bid for construction or installation of the items to which [FILL IN ITEM DESCRIPTION] is required.

Payment will be made under:

|  |  |  |
| --- | --- | --- |
| **ITEM NO.** | **ITEM DESCRIPTION** | **UOM** |
| 684.0010 | FIELD-HARDENED ETHERNET SWITCH | EA |

**END OF SECTION 684**