



# Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

June 28, 2024

SUBJECT FAP Route 307 (IL 64)  
Project CMAQ-NHPP-1DXU(858)  
Section 2020-263-SUR,SW&TS  
DuPage and Cook Counties  
Contract No. 62N40  
Item No. 230, June 14, 2024 Letting  
Addendum A

## NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised the Schedule of Prices
2. Revised pages 255-258 of the Special Provisions
3. Revised sheets 3 & 34 of the Plans

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Very truly yours,

A handwritten signature in black ink, appearing to read "Jack A. Elston".

Jack A. Elston, P.E.  
Bureau Chief, Design and Environment

MTS

### *Integration*

The Layer III switches shall be integrated by the Contractor into the IDOT D1 field network per the approved configuration document. Configuration, integration, functionality, and compatibility with the existing network are the responsibility of the Contractor.

### **Basis of Payment**

This work will be paid for at the contract unit price per each for ILLINOIS DEPARTMENT OF TRANSPORTATION COMMUNICATIONS NODE.

### **LAYER II DATALINK SWITCH**

Effective: November 1, 2023

Revised: June 1, 2024

892.04TS

### **Description.**

This work shall consist of furnishing and installing a Layer II Ethernet switch used to transmit data from one traffic signal cabinet to another traffic signal cabinet containing a Layer II switch or a Layer III (Network) switch.

### **Materials.**

The Layer II switch shall be environmentally hardened with a minimum of (2) 1Gbps SFP ports and (8) 1Gbps copper RJ45 ports. Two SFP ports shall be populated with environmentally hardened optical modules capable of transmitting the designed distance on single-mode and / or multi-mode fiber optic cable as defined in the plans. An environmentally hardened power supply with input of 120 VAC and sufficient wattage for the switch shall be provided.

The switch shall conform to the following minimum specifications:

- Forwarding Bandwidth 3.8Gbps
- Switching Bandwidth 7.6Gbps
- Forwarding rate: 5.66Mpps with 64-byte packets (Line-rate at all packet sizes)
- Egress buffer: 2 MB
- Unicast MAC addresses: 8000
- Internet Group Management Protocol (IGMP) multicast groups: 255
- Virtual LANs (VLANs): 256
- IPv4 MAC security ACEs: 384 (default Ternary Content-Addressable Memory [TCAM] template)
- Bidirectional, 128 NAT translation entries
- IPv4 routing: 2000 routes, IPv6 routing: 1750 routes
- Layer 2 switching: IEEE 802.1, 802.3, 802.3at, 802.3af standard (see Table 8), VTPv2, NTP, UDLD, CDP, LLDP, Unicast MAC filter, Resilient Ethernet Protocol (REP), Media Redundancy Protocol (MRP) Ring (IEC 62439-2)

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- Security: SCP, SSH, SNMPv3, TACACS+, RADIUS Server/Client, MAC Address Notification, BPDU Guard, SPAN session
- Multicast: IGMPv1, v2, v3 Snooping, IGMP filtering, IGMP Querier
- Safety certifications:
  - UL/CSA 60950-1
  - EN 60950-1
  - CB to IEC 60950-1 (with country deviations)
  - NOM to NOM-019-SCF1 (through partners and distributors)
  - CE Marking
- Hazard location:
  - ANSI/ISA 12.12.01 (Class1, Div2 A-D)
  - EN 60079-0, -15 ATEX Certificate (Class 1, Zone2 A-D)
- EMC emissions and immunity compliance:
  - FCC 47 CFR Part 15 Class A
  - EN 55022A Class A
  - VCCI Class A
  - RoHS compliance
  - AS/NZS CISPR 22 Class A, AS/NZS CISPR 24
  - CISPR11 Class A, CISPR22 Class A
  - ICES 003 Class A
  - CE Marking
  - IEC/EN/EN61000-4-2 (Electro Static Discharge), 15kV air/8kV contact
  - IEC/EN 61000-4-3 (Radiated Immunity, 10 and 20 V/m)
  - IEC/EN 61000-4-4 (Fast Transients - 4kV power line, 4kV data line)
  - IEC/EN 61000-4-5 (Surge 2 kV/1 kV)
  - IEC/EN 61000-4-6 (Conducted Immunity, 10 V/emf)
  - IEC/EN 61000-4-8 (Power Frequency Magnetic Field Immunity)
  - IEC/EN 61000-4-9 (Pulse Magnetic Field Immunity)
  - IEC/EN 61000-4-10 (Oscillatory Magnetic Field Immunity)
  - IEC/EN 61000-4-11 (AC power Voltage Immunity)
  - IEC/EN 61000-4-29 (Voltage Dips Immunity)
  - IEC/EN 61000-6-1 (Immunity for Light Industrial Environments)
  - IEC/EN 61000-6-2 (Immunity for Industrial Environments)
  - IEC/EN 61000-6-4 Class A
  - EN 61326
- Shock and vibration:
  - IEC 60068-2-27 (Operational Shock: 30G 11ms, half sine)
  - IEC 60068-2-27 (Non-Operational Shock 55-70G, trapezoidal)
  - IEC 60068-2-6, IEC 60068-2-64, EN 61373 (Operational Vibration)
  - IEC 60068-2-6, IEC 60068-2-64, EN 61373 (Non-operational Vibration)

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- Industry standards:
  - UL508
  - CSA C22.2 No. 142
  - EN 61131-2 (EMC/EMI, environmental, mechanical)
  - Substation KEMA (IEEE 1613, IEC 61850-3)
  - EN50121-3-2
  - EN50121-4
  - NEMA TS-2 (EMC, environmental, mechanical)
  - ABB Industrial IT certification
  - IP30
  - ODVA Industrial Ethernet/IP support
- Corrosive testing:
  - ISO-12944-6
  - IEC-60068-2-60
- Humidity:
  - IEC 60068-2-52 (salt fog mist, test Kb) marine environments
  - IEC 60068 -2-3
  - IEC 60068-2-30
  - Relative humidity: 5% to 95% non-condensing
- Operating temperature:
  - -40C to +70C (vented enclosure - 40 LFM Air Flow)
  - -40C to +60C (sealed enclosure – 0 LFM Air Flow)
  - -34C to +75C (fan or blower-equipped enclosure – 200 LFM Air Flow)
  - -40C to +85C (IEC 60068-2-2 Environmental Type Testing – 16 hours)
- Operational altitude: Up to 15,000 ft
- Storage temperature:
  - -40 C to +85 C (storage temperature)
  - IEC 60068-2-14
- Storage altitude: Up to 15,000 ft
- Mean time between failure: 374,052 hours (42.7 years)
- Warranty: Five-year

The Cisco IE-3100-8T2C-E Industrial Ethernet Switch and Cisco GLC-LX-SM-RGD SFP are compliant with this specification. Other manufacturers that comply with this specification are allowed.

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Construction Requirements

The Layer II switch and its power supply shall be mounted to either a standard DIN rail or an equipment mounting channel in the cabinet. The power supply shall be hard-wired to the cabinet power, not plugged into one of the traffic signal cabinet power outlets.

Configuration Design Document.

A configuration design document shall be submitted within 60 days after contract award. It shall be prepared by a designer with a minimum of CCNP certification – and shall include proof of currently active CCNP credentials. The document shall contain actual configuration files for each switch to be delivered under this contract.

The Layer II switch shall be configured to be compatible with the IDOT D1 field network design. High level guidance (IP Scheme / VLANs / routing protocols, etc.) will be provided by IDOT but the integration, functionality and compatibility with the existing network are the responsibility of the contractor.

The configuration design document shall meet the acceptance of the IDOT engineer. Contractor to coordinate with IDOT Electric Maintenance Contractor and Network engineer for proper set up and IP configuration.

Basis of Payment.

This work will be paid for at the contract unit price per each for LAYER II DATALINK SWITCH, the price of which shall include all equipment, materials, and labor required to furnish, configure and install the switch, including all necessary connectors, cables, fiber optic jumpers, hardware, software, and other peripheral equipment required to place the switch in operation to the satisfaction of the Traffic Engineer.

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