

FLORIDA DEPARTMENT OF TRANSPORTATION

Procurement Office  
605 Suwannee Street, MS 20  
Tallahassee, Florida 32399-0450  
Phone: (850) 414-4568  
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ADDENDUM NO. 1

DATE: December 3, 2014

BID#: ITB-DOT-14/15-9021-JP

BID TITLE: Furnish, Install and Commission Networking Equipment at Location in Tallahassee

REVISED OPENING DATE: January 7, 2015 at 3:00p.m., Local Time

Notice is hereby given of the following changes and attachments to the above referenced Invitation to Bid:

**-Delete:** Bid Sheet pages 2 & 3, SPECIAL CONDITIONS, Paragraph 13 Method of Compensation and Exhibit A, Scope of Services in its entirety

**-Replace with:** Bid Sheet pages 2 & 3, revised 12/3/2014, Exhibit B, Method of Compensation and Exhibit A, Scope of Services attached to this addendum

**Bidders must acknowledge receipt** of this Addendum by completing and returning to the Procurement Office, by no later than the time and date of the bid opening.

**Failure to do so may subject the bidder to disqualification.**

*Joyce Plummer, Procurement Agent*

\_\_\_\_\_ Bidder

\_\_\_\_\_ Address

\_\_\_\_\_  
\_\_\_\_\_ Submitted by (Signature)

Failure to file a protest within the time prescribed in Section 120.57(3), Florida Statutes, or failure to post the bond or other security required by law within the time allowed for filing a bond shall constitute a waiver of proceedings under Chapter 120, Florida Statutes.

**BID SHEET**

BID NUMBER: ITB-DOT-14/15-9021-JP      FOB: Tallahassee Telecommunications Network Sites  
 BID TITLE: Furnish, Install and Commission Networking Equipment at Locations in Tallahassee

<b>WORK SITE LOCATIONS</b>	<b>PRICE PER PROJECT</b>
<b>Project 1. Transportation Engineering Research Lab (TERL)</b>  Equipment  Equipment Installation Substantial Completion  Testing and Documentation	\$ _____
<b>Project 2. Tallahassee FHP Site (TFHP)</b>  Equipment  Equipment Installation Substantial Completion  Testing and Documentation	\$ _____
<b>Project 3. Tallahassee Public Safety Complex (PSC)</b>  Equipment  Equipment Installation Substantial Completion  Testing and Documentation	\$ _____
<b>Project 4. FDOT ITS Central Office – Rhyne Building</b>  Equipment  Equipment Installation Substantial Completion  Testing and Documentation	\$ _____
<b>Project 5. Statewide Emergency Operation Center (SEOC)</b>  Equipment  Equipment Installation Substantial Completion  Testing and Documentation	\$ _____
<p style="text-align: right;"><b>*Total Price for Projects 1-5</b>      \$ _____</p>	

**\*The Total Price for Projects 1-5 will be used to determine the intended award of this contract.**

**MFMP Transaction Fee:**

All payment(s) to the vendor resulting from this competitive solicitation **WILL** be subject to the 1% MFMP Transaction Fee in accordance with the attached Form PUR 1000 General Contract Condition #14.

**NOTE:** In submitting a response, the bidder acknowledges they have read and agree to the solicitation terms and conditions and their submission is made in conformance with those terms and conditions.

**ACKNOWLEDGEMENT:** I certify that I have read and agree to abide by all terms and conditions of this solicitation and that I am authorized to sign for the bidder. I certify that the response submitted is made in conformance with all requirements of the solicitation.

Bidder: \_\_\_\_\_ FEID# \_\_\_\_\_

Address: \_\_\_\_\_ City, State, Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Printed/Typed: \_\_\_\_\_ Title: \_\_\_\_\_

**EXHIBIT "B"**  
**METHOD OF COMPENSATION**

1.0 PURPOSE:

This Exhibit defines the limits and method of compensation to be made to the Vendor for the services set forth in Exhibit "A" and the method by which payments shall be made.

2.0 COMPENSATION:

For the satisfactory performance of services detailed in Exhibit "A", the Vendor shall be paid up to a Maximum Amount. The Maximum Amount will consist of Lump Sum Amounts to be determined by the Department.

3.0 PROGRESS PAYMENTS:

The Vendor shall submit invoices in a format acceptable to the Department. Payments will be made on a percentage complete basis of each site price. Percentage completion will be determined by FDOT Project Manager. Payments will be made as follows:

1. Upon receipt of major equipment and inspection of the equipment (routers, switches and GBICs) by the FDOT Project Manager the Vendor will be paid 40% of per site price.
2. Upon completion of the site installation work including furnishing, installing and Substantial Completion and approval of FDOT's Project Manager the Vendor will be paid 30% of per site price.
3. Upon completion of the 20 day performance test, documentation and approval of FDOT's Project Manager the Vendor will be paid 30% of per site price.

4.0 FINANCIAL CONSEQUENCES:

Payment will not be made to the Vendor until the products have been delivered and/or the specified services have been satisfactorily performed and accepted by the Department unless advance payments are authorized.

**Invoices shall be submitted to: Florida Department of Transportation  
Randy Pierce, Project Manager  
605 Suwannee Street, MS 90  
Tallahassee, Florida 32399-0450**

5.0 TANGIBLE PERSONAL PROPERTY:

This contract does not involve the purchase of Tangible Personal Property, as defined in Chapter 273, F.S

# **EXHIBIT A**

## **FLORIDA DEPARTMENT OF TRANSPORTATION**

### **SCOPE OF SERVICES**

**FOR THE**

**CITY OF TALLAHASSEE FIBER RING DEPLOYMENT**

**TO SUPPORT**

**CENTER-TO-CENTER COMMUNICATIONS**

November 18, 2014

Florida Department of Transportation  
2740 Centerview Dr  
Tallahassee, FL 32301  
Voice: (850) 410-5500  
Fax: (850) 410-5501

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## PROJECT SCOPE

### General Overview

The ITS (Intelligent Transportation Systems) Section of the Traffic Engineering & Operations Office, a unit of the Florida Department of Transportation (FDOT) has implemented, configured, manage and maintain the Statewide Intelligent Transportation Systems Network (SITSN) to enable center-to-center (C2C) communications and interoperability between districts' traffic management systems (TMS) software installed at FDOT districts' Regional Traffic Management Centers (RTMCs), and to share traffic management data and digital closed-circuit television (CCTV) traffic-camera video between FDOT districts and other users. C2C communications and interoperability will encompass both SunGuide TMS software at district RTMCs and SunNav software at the Turnpike Enterprise (FTE) RTMCs. The SITSN is a private statewide Internet Protocol (IP) network. Now fully implemented the SITSN spans statewide, connecting facilities in each of the seven FDOT districts and the FTE.

The City of Tallahassee Ring (CoT Ring) is an extension of the aforementioned SITSN, connecting the ITS network core switch/routers to several additional sites within the City of Tallahassee; FDOT Transportation Engineering Research Laboratory (TERL) and the Tallahassee FHP site, to the City of Tallahassee Public Safety Center (PSC), the FDOT ITS Rhyne Building and the Statewide Emergency Operations Center (SEOC).

Existing equipment will be upgraded and new equipment installed at five sites within Tallahassee to support the ring; connectivity between FDOT Transportation Engineering Research Laboratory (TERL) and the Tallahassee FHP site, to the City of Tallahassee Public Safety Center (PSC), the FDOT ITS Central Office at the Rhyne Building, within Koger Executive Center II, and the Statewide Emergency Operations Center (SEOC).

Detailed technical descriptions of the site installations are given in Section 4, Technical Installation Requirements.

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## **Conduct of the Work**

The successful Proposer (hereinafter "Contractor") shall coordinate with FDOT for access to the sites and work areas. The Contractor shall provide security for his equipment as required by FDOT and shall conduct his operations so as to avoid interference with FDOT's normal operations.

Before ordering materials or doing work that is dependent for proper size or installation upon coordination with job conditions, the Contractor shall verify all dimensions by taking measurements at the sites and shall be responsible for the correctness of same. No consideration will be given to any claim based on the difference between the actual dimensions and those indicated on the drawings. Any discrepancies between the drawings and/or specifications and the existing conditions shall be referred to the FDOT Project Manager for adjustment before any work affected thereby is begun.

Work to be performed outside this Scope of Services shall be referred to as "by others," or if by FDOT's designated representative, then "by FDOT." It shall be the responsibility of the Contractor to coordinate his work with that of FDOT or others whenever and wherever such coordination is required. Where the Contractor performs work that ties into existing facilities, he shall coordinate such work with the FDOT to minimize downtime.

## **Contractor's Responsibilities**

The Contractor is solely responsible for providing all equipment, materials, and services required by this Scope of Services. Notwithstanding the specific requirements delineated in this Scope of Services, it is the Contractor's responsibility to verify the completeness of the materials required and suitability of devices employed to meet the requirements and specifications contained herein. The Contractor shall provide and install, without claim, any additional materials, devices, equipment, and services required for proper operation as required by and in accordance with this Scope of Services.

### **Examination of Specifications**

The Contractor shall carefully read, examine and understand the specifications contained herein regarding the site conditions and any requirements that may, in any manner, affect the work to be performed and/or the materials required to perform such work under the specifications of this Scope of Services. It is the responsibility of the Contractor to verify the completeness of the materials required and suitability of devices employed to meet these specifications.

### **Examination of Work Sites**

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The Contractor shall carefully visit, examine and understand the conditions at each worksite location listed herein and shall make note of the site conditions and any site requirements that may, in any manner, affect the work to be performed and/or the materials required to perform such work under the specifications of this Scope of Services. It is the responsibility of the Contractor to accommodate all such site conditions and meet such site requirements as may be necessary to meet these specifications.

### **Contractor's Project Manager**

The Contractor shall designate a Project Manager for the duration of the Contractor's obligations to FDOT under this Scope of Services. The Contractor's Project Manager shall:

- Be the single point of contact for FDOT with regard to this project.
- Be in responsible charge of work at FDOT sites during all on-site work.
- Have authority over all on-site personnel provided by the Contractor or and/or the Contractor's sub-contractors.
- Be thoroughly familiar with the requirements of this Scope of Services.
- Be available by telephone during normal business hours (8:00 AM to 5:00 PM, Eastern Time) for the duration of this contract.

### **Authority to Suspend Contractor's Operations**

FDOT has the authority to suspend the Contractor's operations, wholly or in part. FDOT will order such suspension in writing, giving in detail the reasons for the suspension. Contract time will be charged during all suspensions of the Contractor's operations. FDOT may grant an extension of contract time when determined appropriate in FDOT's sole judgment.

No time extension will be granted to the Contractor when the operations are suspended for, including but not limited to, the following reasons:

- The Contractor fails to comply with the contract documents.
- The Contractor fails to carry out orders given by FDOT.
- The Contractor causes conditions considered unfavorable for continuing the work.

The Contractor shall immediately comply with any suspension order. The Contractor shall not resume operations until authorized to do so by FDOT in writing. Any operations performed by the Contractor after the issuance of the suspension order, and prior to FDOT's authorization to resume operations, will be at no cost to FDOT, without regard to whether otherwise constructed in conformance with the provisions of the contract. Further, failure to immediately comply with any suspension order will also constitute an act of default by the Contractor and is deemed sufficient basis in and of itself for FDOT to declare the Contractor in default.

### **Changes in Work**

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FDOT may at any time, by written amendment to the contract for this Scope of Services, make changes within the general scope of the work, including, but not limited to, revisions, deletions or additions to portions of the work; or changes in the method of shipment or packaging and place of delivery, upon appropriate approvals as allowed by FDOT's procurement code.

If any change order initiated by FDOT causes an increase or decrease in the cost or time required for the performance of any part of the work under this Scope of Services, an equitable adjustment shall be made by FDOT in the contract price or delivery schedule, or both, and the contract shall be modified in writing accordingly. Adjustments to contract price for labor shall be based on the actual direct labor and burden reasonably incurred in the additional or unforeseen work, plus a mark-up not to exceed 10%. Adjustments to contract price for actual equipment and supplies shall be based on the actual cost of equipment and supplies incorporated into the work, including Contractor-paid transportation charges, reasonably incurred in the additional or unforeseen work, plus a mark-up not to exceed 10%.

### **No Waiver of Contract**

Changes made by FDOT shall not waive any provisions of this Scope of Services, nor may the Contractor make any claim for loss of anticipated profits due to such changes, or by reason of any variation between the approximate quantities and the quantities of work actually performed. All work shall be performed as directed by FDOT and in accordance with this Scope of Services.

### **Site Access and Security Requirements**

The SITSN Southwest Florida Deployment addressed in this Scope of Services will support public safety applications, specifically Intelligent Transportation Systems. To ensure security for the SITSN, FDOT may require the Contractors and any and all subcontractors to submit to security background checks performed by the Florida Department of Law Enforcement after award of contract.

### **Right to Remove Personnel from Project**

FDOT reserves the right to remove any Contractor or subcontractor personnel from the project for any reason. In the event FDOT chooses to exercise this right, a written notification will be sent to the Contractor, via electronic facsimile, stating that a particular person is to be removed from the project. The Contractor shall remove the designated person from the project within 24 hours of transmission of the written notice.

### **Warranty**

All equipment, software, and services furnished by the Contractor as part of this Scope of Services shall be warranted to be free from defects in material and workmanship, and to conform to the specifications in this Scope of Services. In the event any such defects in

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equipment, software, or services become evident within the warranty period, the Contractor shall correct the defect by either:

- Repairing any defective component of the equipment.
- Furnishing and installing necessary replacement parts.
- Otherwise correcting any reproducible and/or recurring software defects.
- Reperforming the faulty services.

The Contractor shall be responsible for all costs and/or charges incurred in returning defective parts to Contractor's, subcontractors', or suppliers' facilities, and in shipping repaired and/or replacement parts to FDOT sites. Labor to perform warranty services shall be provided at no charge during the warranty period and shall be performed by either the Contractor or other service providers approved by the Contractor for such purposes.

The Contractor further warrants that during the warranty period equipment and software furnished under this Scope of Services shall operate under normal use and service as a complete system, which shall perform in accordance with:

- The specifications in this *Scope of Services for the Deployment of the SITSN for C2C Communications*;
- The Contractor's responses thereto;
- All exceptions agreed to by the Contractor and FDOT.

If the equipment fails to operate during the warranty period, the contractor shall perform the contractor's obligations as specified in this section at the contractor's expense.

The warranty period shall extend to June 30, 2016. Claims under any of the warranties herein are valid if made within 30 days after termination of the warranty period.

It is the Contractor's responsibility to provide a minimum of the following Avaya service levels for the new equipment within the Scope of Services. FDOT requires three types of Avaya Support Services descriptions: Repair Services Pack – Return and Replace (GL6300000) for ERS 8600's and the Software Release Subscription / SRS (GW6300000) on all products.

Further, the Contractor will/shall warrant that all equipment furnished hereunder is new and of current manufacture.

The following additional specific requirements apply to the Contractor's warranty:

- FDOT shall notify the Contractor within a reasonable time after the discovery of any failure or defect occurring within the warranty period.
- Should the Contractor fail to remedy any failure or defect within thirty consecutive days after receipt of notice thereof, or within the time specified in the notice, the parties

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shall meet and discuss an extension of time which may be fair and equitable under the circumstances. Failing this, the FDOT shall have the right to replace, repair, or otherwise remedy such failure or defect at the Contractor's expense.

- The Contractor shall obtain any warranties which subcontractors and/or suppliers give to the Contractor in the regular course of commercial practice, and shall apply the same to the benefit of FDOT. However, no such warranties shall act to diminish the Contractor's warranty obligations.
- FDOT shall not be responsible for the storage of any equipment associated with this Scope of Services.
- The Contractor shall remedy at his own expense damage caused by the Contractor to FDOT-owned or controlled real or personal property.
- The Contractor shall be liable to FDOT for supply of information, materials, and labor necessary for mandatory revisions required by the manufacturer for the duration of the warranty period, at no cost to FDOT.
- The Contractor shall remedy at his own expense any failure to conform to general contract terms, system requirements, or any other document included by reference into this Scope of services. The Contractor also agrees to remedy at his own expense any defect in materials or workmanship.
- Acceptance of systems/equipment by FDOT shall not limit FDOT's warranty rights, as set forth above, with respect to defects in materials or workmanship.
- The Contractor's warranty obligations shall not apply to:
  - Defects which are the result of improper storage, use, or maintenance performed by other than the contractor, its subcontractors or suppliers, or repair performed by other than the contractor, its subcontractors, or suppliers (except as may be provided pursuant to paragraph C above).
  - Equipment which has been subjected to any other kind of misuse or accident causing damage to that equipment.
- The Contractor shall furnish to FDOT all information, materials and labor necessary to accomplish all mandatory hardware and software revisions, updates, and upgrades issued by the equipment manufacturer, at no cost to FDOT, for the duration of the warranty period.

Certification of Final Acceptance as described herein shall in no way limit FDOT's warranty rights as set forth herein.

### **Equipment Acceptance and Performance Period**

There shall be a 30-day equipment acceptance and performance period, which shall start upon successful Certification of Final Acceptance and shall end 30 days thereafter. Any and all failures of the network system, including but not limited to failures to perform adequately, shall be immediately corrected by the Contractor at no cost to FDOT. Following correction(s) of any such failure(s) and subsequent approval of the correction(s), the equipment acceptance and performance period shall restart and shall end 30 days thereafter.

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### **Materials and Workmanship**

All equipment and component parts furnished shall be new, shall meet or exceed the minimum requirements stated herein, and shall perform to manufacturer's specifications.

All equipment and component parts shall be of high quality workmanship and shall utilize the most current technology available. No part or attachment shall be substituted or applied contrary to the manufacturer's recommendations and standard practices. At the time of delivery and installation, the most current revision model of each type of equipment meeting or exceeding the requirements of this contract shall be provided, regardless of the model specified in this Scope of Services or offered in the proposal.

### **Software Updates**

The Contractor shall provide the most current versions of software available at the time of the negotiated delivery within the project schedule. The Contractor shall also provide, at no additional charge, software releases and associated documentation intended by the vendor/manufacturer to be generic version updates to correct reproducible and/or recurring defects (software bugs).

The Contractor shall provide timely pre-release notification and documentation of all planned system software upgrades during the project schedule.

### **Patents and Royalties**

The Contractor warrants that the equipment and software furnished hereunder shall be delivered free of any rightful claim of any third party for infringement of any United States patent or copyright. If the Contractor is notified by FDOT of the receipt of any claim that the equipment or software infringes a United States patent or copyright and FDOT gives the Contractor information, assistance, and exclusive authority to settle and defend such claim, the Contractor shall, at his own expense, defend and hold harmless FDOT from, or may settle, any suit or proceeding against FDOT so far as based on a claimed infringement which breaches this warranty. If, in any such suit arising from such claim, the continued use of the equipment and software for the purpose intended is enjoined by any court of competent jurisdiction, the Contractor shall, at its expense and option, either procure for FDOT the right to continue using the equipment and software, or modify the equipment and software so that it becomes non-infringing, or replace the equipment and software or portions thereof so that it becomes non-infringing.

FDOT reserves the right to be actively involved in any litigation arising hereto.

### **Pre-Construction Conference**

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A pre-construction conference and organizational meeting will be held in Tallahassee, Florida at an FDOT location, to be determined. Required attendees will be notified of the date and time. Minutes of the meeting will be prepared and distributed by the Project Manager.

### **Progress Meetings**

FDOT will conduct progress meetings at regularly scheduled intervals, the dates, times and locations of which are to be determined. Locations will be FDOT facilities in Florida. Minutes of each meeting will be prepared and distributed by FDOT.

### **Submittals**

#### ***General***

This section specifies administrative and procedural requirements for submittals required for performance of the work described in this Scope of Services, including but not limited to:

- Contractor's construction schedule.
- Product data.
- Special reports.

Unless otherwise specified herein, all submittals to FDOT shall consist of two identical copies.

#### ***Coordination***

Preparation and processing of submittals shall be coordinated with performance of construction activities. The Contractor shall transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

The Contractor shall coordinate each submittal with purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

The Contractor shall coordinate transmittal of different types of submittals for related elements of the work described in this Scope of Services such that processing will not be delayed by the need to review submittals concurrently for coordination.

FDOT reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

#### ***Product Data***

The Contractor shall collect all product data into a single submittal for each installed site. The product data shall include printed information such as manufacturer's installation instructions, user manuals, and performance specifications.



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The Contractor shall mark each copy to show applicable choices and options. Where printed product data includes information on several products, some of which are not required, the Contractor shall mark copies to indicate the applicable information. The Contractor's certification that the product complies with contract document requirements shall be included.

The Contractor shall submit four copies of each required submittal. FDOT will respond to the Contractor with approval or a listing of any corrections or modifications required.

The Contractor shall furnish copies of product data to installers, subcontractors, suppliers, manufacturers, and others as necessary for performance of the work. The Contractor shall indicate such distribution on transmittal forms.

### ***Special Reports***

Except as otherwise indicated herein, the Contractor shall submit special reports directly to FDOT within one day of any occurrence requiring a special report, with copies to all other entities affected by the occurrence.

The Contractor shall prepare and submit reports of significant accidents at the sites and anywhere else work is in progress. The Contractor shall record and document data and actions and shall comply with applicable industry standards. A significant accident is defined as any incident or occurrence in which personal injury is sustained, loss of property and/or substance is sustained, or in which a significant threat of personal injury or loss of property/substance arose.

### ***Processing***

The Contractor shall allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

The Contractor shall allow 10 business days for initial review. Additional time shall be allowed if processing must be delayed to permit coordination with subsequent submittals. FDOT will promptly advise the Contractor when a submittal being processed must be delayed for coordination.

If an intermediate submittal is necessary, the Contractor shall process the submittal in the same manner as the initial submittal.

The Contractor shall allow 10 business days for processing each submittal.

No extension of contract time will be authorized due to the Contractor's failure to transmit submittals to FDOT sufficiently in advance of the work to permit processing.

### ***Submittal Preparation***

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The Contractor shall place a permanent label or title block on each submittal for identification. The name of the entity that prepared each submittal shall be indicated on the label or title block.

The Contractor shall provide a space approximately 4" x 5" on the label or beside the title block on design drawings to record the Contractor's review and approval markings and the action taken.

The following information shall be indicated on the label:

- Project name: SITSN – City of Tallahassee Fiber Ring
- Date: yyyy-mm-dd
- Contractor's name and address
- Subcontractor name(s) and address(es), if appropriate.
- Number and title of applicable specification section in this Scope of Services.

#### ***Submittal Transmittal***

The Contractor shall package each submittal appropriately for transmittal and handling. Each submittal shall be transmitted to FDOT using a transmittal form. The Contractor shall record relevant information and requests for data on the transmittal form. Submittals received from sources other than the Contractor will be returned without action.

The Contractor shall certify that the information provided complies with contract document requirements. If the Contractor cannot provide such certification due to the presence of any deviations from contract document requirements, including any variations and limitations, any and all such deviations shall be recorded *and clearly indicated* either on the transmittal form or on a separate sheet appended thereto. Any and all submittals containing deviations from contract document requirements shall be reviewed by FDOT to determine if the deviations are acceptable. FDOT reserves the right to accept or reject any such deviations for any reason whatsoever. Any and all deviations deemed by FDOT to be unacceptable shall be corrected at no additional cost to FDOT and without affecting the work schedule.

#### ***Submittal Actions***

Except for submittals for record, information or similar purposes, where action and return is not required or requested, FDOT shall review each submittal and return comments to the Contractor.

The Contractor shall comply with FDOT's review comments.

### **Contractor's Work Schedule**

#### ***General Overview***

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The Contractor shall prepare a fully developed work schedule. The initial work schedule shall be submitted within 10 days of Contractor's receipt of Notice to Proceed.

The Contractor shall secure time commitments for performing critical elements of the work from all parties involved. Each element on the schedule shall be coordinated with other construction activities, including minor elements involved in the sequence of the work. Each activity shall be indicated on the schedule in proper sequence.

The Contractor shall coordinate the work schedule with subcontractors, the submittal schedule, payment requests and other schedules.

#### ***Distribution***

The Contractor shall print and distribute copies of the work schedule to FDOT, subcontractors, and other parties required to comply with scheduled dates and times.

Should revisions/updates to the schedule be made, the Contractor shall distribute the revised schedule to the same parties as listed in the preceding paragraph. The Contractor shall remove parties from distribution when such parties have both (1) completed their assigned portion of the work and (2) are no longer involved in work activities.

#### ***Schedule Revision and Updating***

After any meeting or activity in which revisions to the work schedule have been recognized or made, the Contractor shall revise/update the work schedule. The revised/updated work schedule shall be issued concurrently with report of any such meeting.

#### **Project Closeout**

##### ***Substantial Completion***

FDOT will consider the project Substantially Complete when the entire system (equipment, hardware, software, connections, configuration, etc.) has been fully installed, is operational, has successfully passed field acceptance testing of all elements, and has successfully passed all required walk-throughs and inspections.

Before requesting inspection for Substantial Completion, the Contractor shall complete the following:

- A. In the application for payment that coincides with, or first follows, the date Substantial Completion is claimed, include supporting documentation for completion as indicated in this Scope of Services.
- B. If 100-percent completion cannot be shown, include a list of incomplete items, the value of incomplete work, and reasons the work is not complete.
- C. Advise FDOT of pending insurance change-over requirements, if any.

- 
- D. Submit all required specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

Upon receipt of a request for inspection for Substantial Completion, FDOT will either proceed with inspection or advise the Contractor of unfulfilled requirements. FDOT will advise the Contractor of work that must be completed or corrected.

FDOT will repeat inspection when requested and assured by the Contractor that the work has been substantially completed.

### ***Final System Inspection***

Upon submission of the testing documentation described in this Scope of Services, the Contractor shall, within seven calendar days of such submission, coordinate with FDOT to establish an acceptable schedule (dates, times and locations) to meet at each and every installation site for a final walk-through and inspection. This schedule shall be distributed to all personnel involved no later than the end of the specified one week. This schedule shall be designed as to complete all walk-throughs and inspections within 14 calendar days of its distribution.

Final system inspection shall be regarded as complete upon:

- Successful completion of all site walk-throughs and inspections; and
- Signed certification by the Contractor that all work has been completed in accordance with, and that the network system performs to, the specifications in this Scope of Services.

### ***Closeout Checklist***

All items listed below, with the exception of item A, shall be bound in individual heavy-duty 3-ring vinyl-covered binders. The Contractor shall make appropriate identification on the front and spine of each binder.

Three sets of all items shall be submitted within 15 calendar days of Substantial Completion for the project.

- A. Equipment removed or replaced to enable the installation and commissioning of new equipment within this Scope of Services is to be labeled, boxed, and returned to the FDOT for use as spare inventory elsewhere in the SITSN.
- B. Testing documentation as required herein.
- C. Application and Certification for Payment (Final), four copies with original signatures and seals.
- D. CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS, AIA Document G706.

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- E. CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS, AIA Document G706A, and releases or waivers of liens from all subcontractors and material and equipment suppliers.
  - F. Power of attorney to make final payment, from surety company.
  - G. CONSENT OF SURETY COMPANY TO FINAL PAYMENT, AIA Document G707.
  - H. Warranties as required by this Scope of Services, in the name of FDOT.
  - I. Verification that FDOT personnel have been trained in the use of the equipment, which shall include a signature sheet signed by personnel who have received training.
  - J. As-built documentation and operation and maintenance manuals.
  - K. Equipment inventory list, which shall include for all items name of manufacturer and item serial number.
  - L. Notarized affidavit of all subcontractor payrolls, bills for materials/equipment and other indebtedness paid and satisfied.
  - M. Transmittal letters signed by FDOT Project Engineer showing that maintenance stock has been turned over to FDOT.

### ***Final Acceptance***

FDOT will Final Accept the project when all required work is completed, the entire system is fully operational, all closeout forms are completed and submitted, and equipment spares, manuals, and training have been provided.

Before requesting inspection for Final Acceptance, the Contractor shall complete the following:

- Successfully complete all testing as set forth in this Scope of Services and provide all required documentation thereof.
- Successfully complete final system inspection as set forth in this Scope of Services and provide all required documentation thereof.
- Submit all required as-built documentation, equipment manuals, and similar final record information.
- Deliver all required spare parts and similar items.
- Complete final clean up requirements.
- Submit the final payment request together with any required releases and/or supporting documentation not previously submitted and accepted.
- Submit an updated final invoice.
- Submit a copy of FDOT's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance. Any and all exceptions shall be indicated on this list.

- 
- Prior to Final Acceptance of the work, the Contractor shall furnish to FDOT the following executed documents (forms to be provided by FDOT at pre-construction conference):
    - CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS, AIA Document G706A, and releases or waivers of liens from all subcontractors and material and equipment suppliers.
    - CONTRACTOR'S AFFIDAVIT OF DEBTS AND CLAIMS, AIA Document G706.
    - CONSENT OF SURETY COMPANY TO FINAL PAYMENT, AIA Document G707.
  - Submit all required inspection certificates, bonds, and written guarantees.
  - Return all keys, security cards, ID cards. etc. provided by FDOT for access to sites. Include affidavit that duplications of keys. security cards, ID cards, etc. have not been made.

Upon receipt of notice that all work has been completed, including inspection-list items from earlier inspections, FDOT will either proceed with inspection or advise the Contractor of unfulfilled requirements. FDOT will prepare the Certification of Final Acceptance following the inspection, or advise the Contractor of work that must be completed or corrected before certification will be issued. FDOT has the sole right to make exceptions for items whose completion has been delayed, if such are deemed acceptable by FDOT.

FDOT will repeat inspection when requested and assured by the Contractor that the work is ready for Final Acceptance.

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## Definitions

FDOT:	State of Florida Florida Department of Transportation Contact person is the FDOT Project Manager (see below) in Tallahassee, Florida.
Scope of Services	This document, the <i>Scope of Services for the Southwest Florida Deployment of the SITSN for Center-to-Center Communications</i> .
Proposer:	The individual, firm, partnership, corporation, company, association, or other legal entity permitted by law to construct projects, or portions of projects, in the State of Florida to whom this specification is submitted and from whom a sealed proposal is received.
Contractor:	The individual, firm, partnership, corporation, company, association, or other legal entity to whom the contract is awarded by FDOT and who is subject to the terms thereof.
Local Contact Persons:	Names and contact information for FDOT Local Contact Persons will be provided at the preconstruction meeting.
FDOT Project Manager (referred to in text as Project Manager):	Randy Pierce, ITS Central Office 605 Suwannee Street, MS 90 Tallahassee, Florida 32399-0450 Voice: (850) 410-5608. Fax: (850) 414-8673 <a href="mailto:randy.pierce@dot.state.fl.us">randy.pierce@dot.state.fl.us</a>

## Acronyms and Abbreviations

'	Foot; feet.
"	Inch; inches.
#	Number.
10/100BASE-T	Ethernet physical medium: 10 or 100 Mb/s, copper wire, four twisted pairs.
1000BASE-SX	Ethernet physical medium: 1 Gb/s, multimode fiber optic, short haul.
100BASE-T	Ethernet physical medium: 100 Mb/s, copper wire, four twisted pairs.
15K	Passport 15000: multi-service ATM switch manufactured by Nortel Networks, Inc.
5200	Optical Metro 5200: Ethernet over CWDM/DWDM optical networking platform manufactured by Nortel Networks, Inc.
8606	Ethernet Routing Switch 8606: IP switch/router manufactured by Nortel Networks, Inc.
A	Ampere (amp).
AC	Alternating current.
add	Address.
ANSI	American National Standards Institute.
ATM	Asynchronous transfer mode: layer-2 protocol used to transport IP over the SMS.
b/w	Bandwidth.
C2C	Center-to-center.
CAT 6	Category 6: describes a high-quality grade of twisted-pair Ethernet cable.
CCTV	Closed-circuit television.
CD-ROM	Compact-disc read-only memory.
CIDR	Classless Inter-Domain Routing
cir, cir.	Circuit.
CO	Central office.
CPU	Central processing unit.
CWDM	Coarse wave-division multiplexing.
D1	District One; District One RTMC.
D2	District Two; District Two RTMC.
D4	District Four; District Four RTMC.
D5	District Five; District Five RTMC.
D6	District Six; District Six RTMC.
D7	District Seven; District Seven RTMC.
dB	Decibel.
DC	Direct current.
demarc	Demarcation point: Physical point in a network demarcating network portions under different ownership, management, or responsibility.
DOT	Florida Department of Transportation.



DWDM	Dense wave-division multiplexing.
EIA	Electronic Industries Association.
ETSI	European Telecommunications Standards Institute.
FDN	Field Data Network: The IP network portion of the SMS used for Corridor Monitoring and RWIS stations (IP address block 10.240/16); one of the subdivisions of the SMS.
FDOT	Florida Department of Transportation.
FHP	Florida Highway Patrol.
FO	Fiber-optic; fiber-optic cable.
FW	Firewall; an FW VLAN is an 8606 internal VLAN connecting an 8606 internal firewall module (iSD) to an exterior physical port on the 8606.
FWP	Firewall peering; an FWP VLAN is an 8606 internal VLAN connecting the 8606 internal routing entity to a firewall module (iSD).
Gb/s	Gigabits per second: 1 Gb/s = 1,000,000,000 (billion) bits per second = 1 000 Mb/s.
GbE	Gigabit Ethernet (1000BASE-SX).
GBIC	Gigabit interface converter: designates the original GBIC type; used generically to refer to any GBIC type (original or SFP).
GHz	Gigahertz: 1 GHz = 1,000,000,000 (billion) hertz = $10^9$ hertz = 0.001 THz.
IP	Internet Protocol.
ISID	Intermediate System IDentifier
ITS	Intelligent transportation system(s).
IWAN	SITSN Applications Network: Routed IP network transporting SITSN management data; one of the two subdivisions of the SITSN. (IP address blocks 10/8, 172.16/12, and 192.168/16 less 10.240/16 (FDN), 172.16/16 (MMN), 192.168.0/24 (NSN), and 192.168.240/20 (IWMN).)
IWMN	SITSN Management Network: Routed IP network transporting ITS applications data; one of the two subdivisions of the SITSN. (IP address block 192.168.240/20.)
km	Kilometer (1 km = 1000 meters = 1000 m).
LAN	local-area network
LC	Type of fiber-optic connector.
lic, lic.	License.
m	Meter (unit of length).
MAN	Metropolitan area network.
Mb/s	Megabits per second: 1 Mb/s = 1,000,000 (million) bits per second = 0.1 Gb/s.
MDN	Microwave Data Network: The ATM and IP services, networks and devices portion of the SMS; one of the subdivisions of the SMS.
mgmt, mgmt.	Management.
MHz	Megahertz: 1 MHz = 1,000,000 (million) hertz = $10^6$ hertz = 0.001 GHz.
MIP	Management IP address; one of two IP addresses that each iSD in an 8606 must have for management.
MMFO	Multimode fiber-optic; multimode fiber-optic cable.

MMN	Microwave Management Network: The IP network portion of the SMS used for management of the SMS (IP address block 172.16/16); one of the subdivisions of the SMS.
MW	Microwave.
n/a	Not applicable.
NAAP	Nortel Appliance Acceleration Protocol.
NDSF	Non-dispersion-shifted fiber: Type of single-mode optical fiber.
NEC	National Electrical Code.
NFPA	National Fire Protection Association.
nm	Nanometer: 1 nm = 0.000 000 001 m = 10 <sup>-9</sup> m.
NMS	Network management system.
NOC	Network operations center.
NSN	NetBoss Support Network: The IP network portion of the SMS used for supporting back-end functions of the NetBoss NMS (IP address block 192.168.0/24); one of the subdivisions of the SMS.
NT	Nortel Networks, Inc.
NTCIP	National Transportation Communications for ITS Protocol: ITS-specific high-level communications protocol.
OCI	Optical channel interface card: OM 5200 card providing 1000BASE-SX connections, on tributary side of OM 5200.
OCLD	Optical channel laser and detector card: OM5200 card providing wide-area optical connections, on line side of OM 5200.
OCM	Optical channel multiplexer card: OM 5200 card providing backplane interconnections.
OEO	Optical-electrical-optical: Used to describe optical signal regeneration. A received optical signal is converted into an electrical signal which is reshaped, retimed and amplified, then converted back into an optical signal which is retransmitted.
OM 5200	Optical Metro 5200: Ethernet over DWDM/CWDM optical networking platform manufactured by Nortel Networks, Inc.
OMX	Optical multiplexer card: OM 5200 card providing wavelength multiplexing function.
opt, opt.	Optical (fiber-optic).
PC	Personal computer.
POC	Point of contact.
PS	Power supply.
PSC	Public Safety Complex, at 911 Easterwood Dr, Tallahassee, FL, 32308
QoS	Quality of service.
ROW	Right of way.
RTMC	Regional traffic management center.
RU	Rack unit: 1.75" of vertical space in an EIA-standard 19" rack frame or rack cabinet.
s	Second (unit of time).

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SC	Type of fiber-optic connector.
SEOC	State Emergency Operations Center
SFP	Small-form-factor pluggable: designates a type of GBIC.
SITSN	ITS Wide-Area Network: Entire SITSN infrastructure, both optical and microwave; subdivided into the IWAN and IWMMN.
SMF	Single-mode fiber; single-mode fiber-optic cable.
SMFO	Single-mode fiber optic; single-mode fiber-optic cable.
SMS	Statewide Microwave System: Entire microwave infrastructure, including Orlando, Stuart and McArthur/Sunrise fiber-optic components; subdivided into the MDN, FDN, MMN and NSN.
SNMP	Simple Network-Management Protocol.
SR	State road.
ST	Type of fiber-optic connector.
CoT Ring	City of Tallahassee Fiber Optic Ring
T-1	Digital circuit: 1.544 Mb/s raw b/w, 1.536 Mb/s usable b/w.
TBS	To be specified.
TERL	Transportation Engineering Research Laboratory.
TFHP	Tallahassee FHP Site, at 2100 Mahan Dr, Tallahassee, FL, 32308
TGC	Telecommunications General Consultant.
THz	Terahertz: 1 THz = 1,000,000,000,000 (trillion) hertz = $10^{12}$ hertz = 1000 GHz.
TIWAN	TERL SITSN Applications Network: A part of the IWAN located at the TERL.
TIWMMN	TERL SITSN Management Network: A part of the IWMMN located at the TERL.
TMC	Traffic management center.
TMS	Traffic management system.
TTBN	TMC Test-Bed Network (located at the TERL).
TVSS	Transient-voltage surge suppressor.
UPS	Uninterruptible power system.
V	Volt (e.g., 4.0 V); version (e.g., V4.0).
VAC	Volts alternating current.
VDC	Volts direct current.
ver, ver.	Version.
VLAN	virtual LAN
WAN	Wide-area network.
wkstn.	Workstation.
XCVR	Transceiver (combination transmitter and receiver).
XFP	10-Gigabit small-form-factor pluggable: designates a type of GBIC.

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## Applicable Publications, Documents and Standards

The following publications and standards of the latest issue on the date, unless otherwise specified, of this Scope of Services shall be included herein by reference. In the event of inconsistencies between this Scope of Services and these publications and standards, the requirements of this Scope of Services shall take precedence.

Refer to the following Avaya technical Publications for the proper procedure to install the equipment:

- NN46205-302, 03.01 for version 7.2 date September 2012.
- NN46205-320, 07.02 for version 7.20.10, date August 2013
- NN46205-303, 07.02 for version 7.2 date November 2012 (for reference only)
- NN46251-309, 01.02 for version 4.0, date April 2014
- NN46251-301, 04.01 for version 4.0.40, date August 2014
- NN47205-300, 07.01 for version 5.8, date June 2014
- NFPA 70 National Electrical Code (NEC).
- IEEE C62.41-1994: Recommended Practice on Surge Voltages in Low-Voltage Data, Communications, and Signaling Circuits.
- Title 47 Code of Federal Regulations (CFR), Telecommunications, Federal Communications Commission Rules and Regulations.
- Applicable manufacturer's instructions and standard practices.

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## Site Locations

### FDOT ITS Central Office

FDOT ITS HQ

2740 Centerview Drive  
Suite 3B  
Tallahassee, FL 32301

Technical Contact 1

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850 322 1408

Technical Contact 2

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850 410 5618 – office  
850 570 5294 – cell

Contact 3

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[frank.deasy@dot.state.fl.us](mailto:frank.deasy@dot.state.fl.us)  
850 410 5608

### FDOT ITS TERL

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850 410 5608

### Tallahassee FHP

FDOT ITS TFHP  
2100 Mahan Drive  
Tallahassee, FL 32304

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Contact:

Jim Bush  
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321 229 1465

**State Emergency Operations Center**

Rudd Building  
2575 Shumard Oak Blvd  
Tallahassee, FL 32399

Contact: SEOC Network Manager

Kevin Smith  
[kevin.smith@em.myflorida.com](mailto:kevin.smith@em.myflorida.com)  
850 922 9921  
850 443 0170

Contact: Facilities Management

Jeff Swain  
[jeff.swain@em.myflorida.com](mailto:jeff.swain@em.myflorida.com)  
850 413 9962

Contact: FDOT Emergency Manager

Jerry Rudd  
850 414 4852  
[jerry.rudd@dot.state.fl.us](mailto:jerry.rudd@dot.state.fl.us)

**SEOC ESF-1**

FDOT EM On Call

[fdot-emoncall@dot.state.fl.us](mailto:fdot-emoncall@dot.state.fl.us)  
850 545 1232

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Contact: Phoenix Projector video wall  
Christie

**City of Tallahassee**

Public Safety Complex / COT Traffic Management Center  
911 Easterwood Drive  
Tallahassee, FL 32311

Contact:

Wayne Bryan  
wayne.bryan@talgov.com  
850 891 8509  
850 891 2080

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## Scope of Services

### General Overview

The drawings and project plans of this Scope of Services are essentially diagrammatic in nature. They are, however, as accurate as scale permits and the Contractor shall follow them as closely as possible. It shall be the responsibility of the Contractor to verify all conditions and measurements relating to the work in the field prior to proceeding with installation. The Contractor shall verify all wall locations and dimensions, rack profiles, cable tray locations and conduit lengths at the existing facilities, including all conditions required to install equipment and systems as described herein and as shown on the drawings. All offsets required for installation of conduit and wiring systems shall be included in this project at no additional cost to FDOT. The Contractor shall coordinate any modifications required by existing conditions to avoid conflicts with building systems and other building components.

The logical configuration information is unique to each device. Detailed and proprietary information will be completed between the winner of the bid and the FDOT ITS engineering team. The particular design information and testing procedure will be used to complete a *COT Configuration, Design and Testing Document*. This document will provide detailed management, routing and multicast protocol, port assignments, VLANs, ACLs and other information in order to install the basic functionality of each device. The development of the logical design will consider existing and future FDOT Statewide ITS Network needs. The *COT Configuration, Design and Testing Document* is a design guideline and the information may be improved upon between the bid winner and FDOT.

The drawings, project plans, and specifications are complimentary, and any work required by one and not the other shall be considered to be required by both. The FDOT Project Manager shall be the sole interpreter of the drawings and specifications.

The Contractor shall note that all drawings and details are diagrammatic in general and indicate the character of the work included. Work intended, but having minor details obviously omitted or not shown, shall be furnished and installed complete to perform the functions desired.

### **Back-ups of Existing Infrastructure Configuration**

The Contractor will take back-ups of all configuration data and/or files of the relevant equipment being upgraded or replaced in this Scope of Services. The backed up data and/or files will be archived to a flash drive and provide to FDOT.

The Contractor is responsible for minimizing downtime of network communications between the TERL and Tallahassee FHP sites, as these two sites are critical for the proper operation of the SITSN. FDOT has sole discretion to determine excessive downtime, and may direct the



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Contractor to cease further upgrades or installations and roll back changes until technical challenges can be overcome.

In the event of the Contractor being unable to complete this Scope of Services in its entirety, including Final Acceptance procedures, the Contractor will be responsible for rolling back any work performed to regress the network to a state exactly as prior to the work described in this Scope of Services took place.

### **As-Built Documentation**

FDOT ITS engineering staff will advise, collaborate and provide required information to the winner of the bid and develop a document that will contain all logical and physical configurations of the network and an application testing procedure. For the purpose of this Scope of Services, it will be called The *COT Configuration, Design and Testing Document*. The Contractor will ultimately develop the document which can be used for final acceptance testing and as built documentation.

Any departure from the installation instructions and/or diagrams provided herein, which may be necessary to accomplish this scope of services, shall be documented by the contractor in writing. If such departure represents a change or changes to any diagram or diagrams herein, the contractor shall provide a new, corrected diagram or diagrams illustrating such change or changes. Such new, corrected diagrams shall also include and illustrate all information contained in the original diagram or diagrams that remains unchanged. This writing and diagram or diagrams, if any, shall constitute required as-built documentation.

It is the Contractor's responsibility to collect and maintain any and all information resulting from this Scope of Services that may be necessary to incorporate into as-built documentation.

Furthermore, any material changes made by the Contractor to the body of work described herein that may become necessary during the equipment acceptance and performance period shall be documented as described above in the first paragraph of this section, and provided within one month of the completion of such changes.

The five sites are broken into two unique hardware configuration scenarios; the two existing sites TERL and TFHP upgrade of the ERS 8600 to the ERS 8800, and the installation of ERS 4450's at the remaining three sites, PCS, Rhyne Building and the SEOC. The following sections are broken down into two sections, physical installation of the two disparaging equipment types; the ERS 8600/8800 and the ERS 4450. Additionally, a Brocade FastIron layer three device will be relocated from one site to another.

Other design information, parts lists, drawings and photos appears in the following section and Appendices.

### **Upgrades of Nortel ERS-8606 to Avaya ERS-8806**

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## **Transportation Engineering Research Laboratory (TERL) and Tallahassee FHP Site (TFHP)**

The TERL and TFHP sites have a Nortel ERS-8606 Ethernet Routing Switch, which will be upgraded to an Avaya ERS-8800 Ethernet Routing Switch.

The chassis for these two devices are the same, but component-level changes need to be made to perform the upgrade.

The following parts will be changed out on the ERS-8606 to turn it into an ERS-8800:

- Fan tray cooling module
- SuperMezz CPU blade (x 2)
- Fiber Optic blade
- 48-port copper Ethernet blade

Refer to the following Avaya technical Publications for the proper procedure to install the equipment:

- NN46205-302, 03.01 for version 7.2 date September 2012.
- NN46205-320, 07.02 for version 7.20.10, date August 2013
- NN46205-303, 07.02 for version 7.2 date November 2012 (for reference only)

Additional Technical Publications can be found at <https://support.avaya.com/documents/>

### **Installation of Avaya VSP-4450 Ethernet Switches**

#### **Tallahassee Public Safety Complex (PSC), The Rhyne Building – Koger Executive Center II, and the State of Florida Emergency Operations Center (SEOC) – ESF 1 Room**

An Avaya VSP-4450 Ethernet Switch will be installed at the PSC, Rhyne Building and the SEOC. Each VSP-4450 will have a unique hardware configuration based on the number of supporting GBIC's required for the site. Regardless of the aforementioned differences, the installation procedure is the same for these three sites. Refer to the following Avaya Technical Publications for the physical installation of the VSP-4450.

- NN46251-309, 01.02 for version 4.0, date April 2014
- NN46251-301, 04.01 for version 4.0.40, date August 2014
- NN47205-300, 07.01 for version 5.8, date June 2014

Additional Technical Publications can be found at <https://support.avaya.com/documents/>

### **The City of Tallahassee PSC**

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An Avaya VSP-4450 Ethernet Switch will be installed in a cabinet in the video wall room of the COT Traffic Management Center within the PSC Building.

Install Foundry router removed from the Tallahassee FHP site.

Please see Appendix A for inter-connection diagrams.

### **The Rhyne Building – Koger Executive Center**

An Avaya VSP-4450 Ethernet Switch will be installed at the Rhyne Building, at the Koger Executive Center II. There is a server room on the second floor of the Rhyne Building within the Business Services Solutions Office (BSSO). Escort will be required to access this room. The equipment cabinet assigned to FDOT SITSN contains a rack-mounted fiber patch panel equipped to support 12-strand single-mode fiber with SC connectors. Mount the VSP-4450 under the patch panel labeled “FDOT ITS to COT”. Connect the AC power to the cabinet’s AC strips.

Please see Appendix A for inter-connection diagrams.

### **The State Emergency Operations Center**

Within the SEOC, the ESF-1 Room has been allocated for FDOT and other agencies. Within that room there is a wall-mounted, 19-inch 12-unit, ventilated equipment cabinet with a locking door (keys in the lock). Identify this cabinet for installation. There is a 19” rack-mountable power distribution strip with a 25-foot AC cord (NEMA 15-5) within the cabinet which will be used to supply power to the Avaya VSP-4450. The power strip obviously must be plugged into a receptacle within the ESF-1 room in order to power the VSP-4450. Also within the cabinet there is a fiber patch panel to support 12-strand single-mode fiber with SC connectors labeled “FDOT ITS WAN”. Patch cables (SC to LC connectors) are already in the cabinet, as well as a 10 meter CAT 6E patch cable.

Please see Appendix A for inter-connection diagrams.

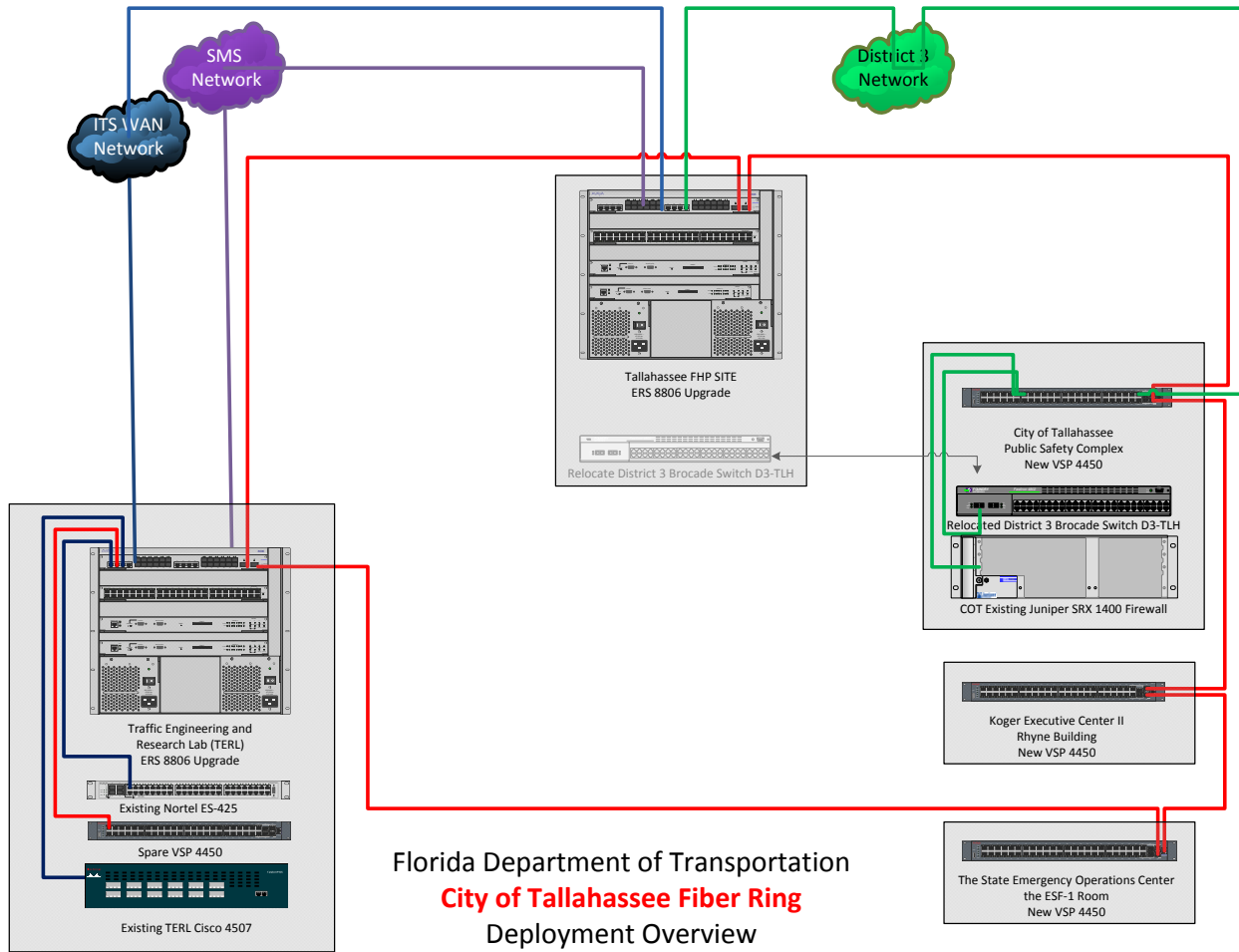
### **Relocation of Brocade Router from Tallahassee FHP Site to Tallahassee Public Safety Complex (PSC) Site.**

Located at the Tallahassee FHP Site, exists a Brocade FastIron layer 3 device. When at Tallahassee FHP Site to install the upgrades for the Nortel 8606, this device will be removed from the rack, as pictured further within this document, in the Per Site Requirements section of this Scope of Services document.

The Brocade FastIron device will be taken to the Tallahassee PSC Site, and re-installed there, also as described and pictured in the Per Site Requirements section of this document.

# Network Design Overview

## General Overview



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## **Hardware/Software Overview**

### **Avaya Ethernet Routing Switch 8806**

An Avaya Ethernet Routing Switch 8806, a multi-function carrier-class IP networking switch, will be located at TERL and TFHP. These 8806s, together with the VSP-4450 switches, will be the SITSN demarcation points in the CoT Fiber Ring.

### **Management Systems**

All devices on the SITSN will be configured and managed by existing Nortel and/or Avaya software running on a server at the TERL. This software includes the Nortel Enterprise Network Management System (ENMS) and Nortel Device Manager. All devices on the SITSN should be managed by the Simple Network Management Protocol (SNMP). Proper community strings, user names, and passwords will be configured by the winning bidder based upon the COT Configuration and Design Document.

### **SITSN and Network Demarcation Points**

To clearly designate the points at which network ownership/management/responsibility transitions from the SITSN to connected networks, the demarcation point (demarc) is defined as an optical port on the on-site 8806, to which will be connected the 1000BASE-SX duplex fiber-optic jumper to the partner's edge device. Thus on the CO's side of the demarc will be the SITSN and the core 8806 optical interface; on the district's side of the demarc will be the fiber-optic jumper and the FDOT partner's optical interface on their edge device, and the partner's network. The CO will be responsible for assuring connectivity at the optical port of the 8806 interface; the FDOT partner will be responsible for assuring connectivity at the optical connector on the 8806 end of the 1000BASE-SX fiber-optic jumper coming from the partner's edge device. Coordination between the installer and the FDOT partner is required to accommodate this connection.

### **Site Installations Summary**

The CoT Fiber Ring requires the installation and configuration of C/DWDM optical transport equipment (supported by 10 Gig SFP+) and Internet Protocol (IP) routers/switches. Also required is the configuration of all installed equipment; such that it can be managed from the existing SITSN Network Management System, located at the TERL in Tallahassee.

### **Technical Design Details**

In-depth information concerning the SITSN CoT Ring technical design is available from FDOT. The Contractor is advised to request this information and read, understand, and develop familiarity with it.

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## Technical Installation Requirements

### Requirements Applicable to the Entire System

#### *Functionality and Performance Requirements*

The network resulting from the execution of the work described in this scope of services, which is the SITSN CoT Fiber Ring, shall be carrier-class, standards-based, scalable, upgradeable, and capable of 99.999% uptime. Based on the COT Configuration and Design Document, the network shall support unicast and multicast IP and shall be state-of-the-art with respect to general IP capabilities. Via IP the network shall support the following application traffic throughout the network:

1. C2C communications between instances of SunGuide TMS software, and/or instances of SunNav TMS software with the SunGuide interface.
2. Digital traffic-camera video and other multicast sources.
3. General ITS data communications.
4. Other application traffic (general IP transport).

Supported features of the network shall include, at a minimum, the following:

1. IP quality-of-service (QoS).
2. PIM-SM and PIM-SSM multicast.
3. CWDM, of a type which shall be expandable to DWDM in the future.
4. 1000 BASE-SX full-duplex GbE user interfaces.
5. 10/100/1000 BASE-TX full-duplex Ethernet user interfaces.
6. Integral hardware redundancy.
7. SNMP management.

#### *Configuration Requirements*

After award of contract, FDOT shall provide detailed equipment-configuration specifications to the Contractor via the COT Configuration and Design Document. The provided specifications shall include configuration requirements for both the SITSN equipment required by this Scope of Services, and for certain existing equipment which must be reconfigured so as to interface with that of District 3. The provided specifications will generally be organized on a per-site basis, and will include but are not limited to:

- Overall SITSN architecture, rationale and design summary:
  - Layer Seven design (applications to be served).
  - Layer Three design (TCP/IP details).
  - Layer Two design (10/100/1000 BASE-T and 1000 BASE-SX Ethernet)
  - Wide-area long-haul optical architecture.
  - Fiber-optic backbone (existing cable).

- 
- Site floor plans, equipment rack profiles, patch-panel port designations, and other site-specific equipment placement and mounting details.
  - Equipment external configuration:
    - Slot, card and port (GBIC) insertion, location and usage.
    - Cabling and interconnection details for both network and power connections.
  - Equipment internal configuration:
    - "Hard" configuration such as jumper positions, internal switches settings, etc.
    - "Soft" configuration via front-panel controls, craft ports, command-line interfaces, network management system, etc. of:
      - Optical parameters
      - Ethernet parameters
      - VLANs, internal and external (tagged)
      - Routing
      - Access control lists
      - QoS and priority
      - Names of network entities
      - Management
  - NNI to the existing infrastructures must be designed and implemented according to the COT Configuration and Design Document

## **Requirements Applicable to Single-Mode Fiber-Optic Infrastructure**

### **Assumptions**

In determining the equipment, supplies and procedures required to meet the requirements of this scope of services, the contractor may make the following assumptions:

- 1) A fiber characterization test was performed on all portions of the fiber between the sites and the results support the design of the specified SFP's in this document. The Fiber Characterization Report is available upon request to the winner of the bid.
- 2) All existing single-mode fiber-optic infrastructure is non-dispersion-shifted fiber (NDSF).
- 3) Span loss is 0.3 dB/km (includes a 10% repair budget).
- 4) Each span has four fiber patch panels: local end, two intra-span (with jumper between), and remote end.
- 5) Each patch panel connection has a 0.3 dB loss (e.g., a patch panel with a jumper between two ports would have a loss in dB of  $2 \times (0.3) + J$ , where J is the loss of the jumper cable).
- 6) Proper patch cables are available for the 10 Gigabit COT Ring proper. All connecting fiber patch cables may need to be provided by the winner of the bid.

## **Requirements Applicable to All Sites**

### **Installation Requirements**

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All installation work shall be performed in a neat and orderly fashion, following generally accepted good engineering and installation practices, except as otherwise required herein. The Contractor shall adjust, reposition, bolt, clamp, tighten, affix, etc. existing rack and/or frame components and/or hardware as may be necessary to firmly and safely mount equipment and accomplish the work specified herein.

The Contractor shall provide all miscellaneous hardware (wood screws, machine screws, bolts, nuts, washers, rack-mounting hardware, brackets, small metal stock, shims, cable ties, etc.) as may be necessary to accomplish the work specified herein.

All cables, attenuators, components, hardware, devices, and other items provided under this scope of services and shipped to sites, whether used or not, will become the property of FDOT. Any and all such cables, components, hardware, devices, and other items not used in the installations described herein shall be turned over to either the FDOT Project Manager or the Project Manager's designated representative upon completion of each site installation.

### **Cabling Requirements**

All electrical and optical cabling and wiring shall be installed in accordance with good engineering practice, neatly tied, bundled, and dressed, and shall conform to NEC, NFPA and local codes. Efficient use shall be made of existing cable management systems, hardware, trays, etc. Consideration shall be given to maintaining consistency with existing cabling practice at all sites. Labeling of cables is not a requirement of this scope of services.

Copper signal, AC power and fiber-optic cables, jumpers and wiring shall be run in separate bundles. Bundling shall be accomplished using black ultraviolet-resistant nylon cable ties of appropriate size(s) and/or separate wiring-management ducts and/or devices. These bundles shall be affixed using black ultraviolet-resistant nylon cable ties of appropriate size(s), which are separate from those ties used to create the bundles, to racks, rack and cabinet hardware, cable trays, cable troughs, walls, backboards etc. Such affixing is not required if affixing is accomplished by means of wiring management ducts and/or devices.

Copper signal and AC power cables and bundles thereof shall be separated from one another with as great a distance as is reasonable. If such cables and/or bundles must cross one another, every attempt shall be made to make the angle of crossing equal to 90° (a right angle); if a 90° angle is not possible, the angle of crossing shall be kept as close to 90° as possible.

Optical cables and jumpers which have one end terminated in a given 19" frame or rack and the other end in a location external to the rack shall be run in innerduct of appropriate size. Multiple optical cable/jumpers may share a common innerduct. Innerduct shall extend into the interior of the rack; optical cables and jumpers shall not be exposed external to the rack. Those optical cables and jumpers having both ends terminated in the same 19" frame or rack need not be run in innerduct.



For -48 VDC power cabling, the “A” power bus cabling shall employ red-jacketed cable for the negative 48 VDC (hot) side of the power supply and black-jacketed cable shall be used for the positive (return, ground) side. The “B” power bus cabling shall employ white-jacketed cable for the negative 48 VDC (hot) side of the power supply and black-jacketed cable shall be used for the positive (return, ground) side.

Both AC and DC power cables shall be sized in accordance with NEC and manufacturers’ recommendations.

**Grounding Requirements**

The Contractor must assure that all equipment racks in which equipment is mounted are grounded to the existing site ground bus in a manner consistent with other grounding at each site.

**Per-Site Requirements**

**Transportation Engineering Research Lab (TERL)**

**Summary**

A Nortel ERS-8606 in an existing rack will be upgraded to an Avaya ERS-8806. Two appropriate GBICs shall be provided for the existing fiber network. A duplex multimode fiber-optic patch cord shall interconnect the TERL Cisco 4507 switch and the 8806 (1000BASE-SX).

The 8806 shall be managed by the existing SITSN NMS.

**Equipment**

The equipment required for the TERL installation is:

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2	AA1403001-E5	1-port 10GBase-LR/LW XFP. LAN/WAN functionality based on port configuration/capability. Supports single-mode fiber for interconnects up to 10km.
6	AA1419048-E6	1-port 1000BASE-SX Small Form Factor Pluggable (SFP) Gigabit Ethernet Transceiver, connector type: LC. Digital Diagnostic Monitoring Interface.
4	AL1905E21-E6	Ethernet Routing Switch 4800GTS-PWR+ 1000W AC redundant power supply. EUED RoHS 6/6 compliant]. NA Power Cord
1	DS1404120-E5	Ethernet Routing Switch 8895SF Switch Fabric/CPU to enable redundant terabit core configurations. One required with R/RS Modules, 2nd for load-sharing and redundancy. Operable with R/RS modules. Includes 1GB SDRAM and 2GB Compact Flash.
1	DS1404123-E6	8834XG Routing Switch Module. Combination module with 2 port 10GBase-X XFP, 24 port SFP (inc 100FX support) and 8 port autosensing 10BASE-T/100BASE-TX/1000Base-T baseboard (XFPs and SFPs purchased separately). The 8834XG requires the 8692wMezz or 8895S

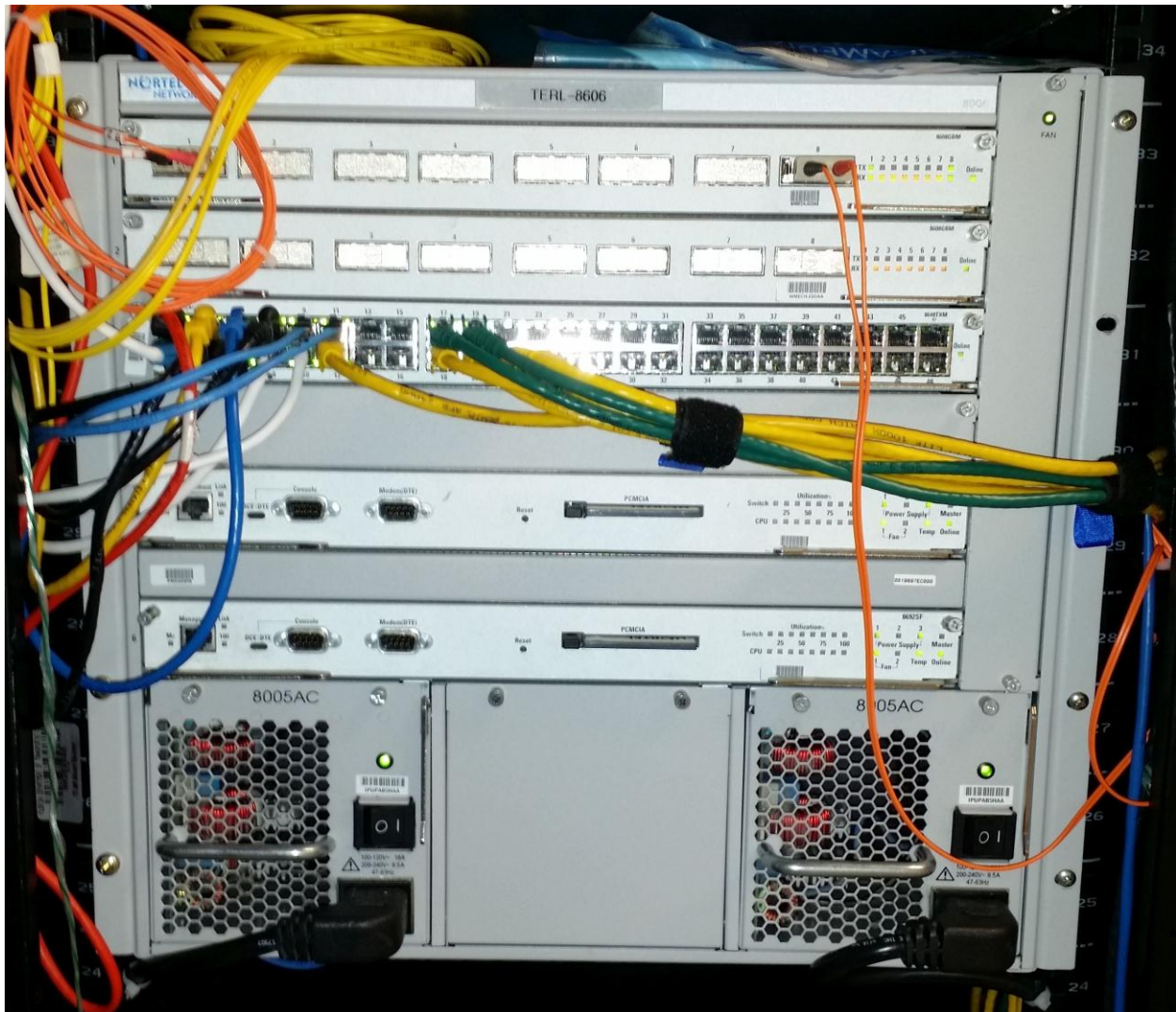
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1	DS1404124-E6	8848GT Routing Switch Module. 48 port autosensing 10BASE-T/100BASE-TX/1000Base-T Ethernet Layer 3 switching interfaces. 8848GT requires the 8692SFwMezz or 8895SF.
1	DS1410026	Ethernet Routing Switch 8800 Premier License Kit, for 1 chassis. Enabled features: Advanced features, VRF-Lite, MP-BGP, IP-VPN MPLS RFC2547, IP-VPN-Lite (IP-in-IP) & Mcast Virtualization for VRF-Lite (IGMP, PIM-SM/SSM). Refer to release notes for list of
1	DS1411018-E6	Spare 8006CMHS fan tray for 8006 chassis. Required for use with ERS8600 RS series modules and MERS8600 RC series modules. 8006 chassis uses 1 x DS1411018-E6.
		1m Cat 6 patch cable - blue
		1m Cat 6 patch cable - white
		1m Cat 6 patch cable - black
1		1m Cat 6 patch cable - purple
		1m Cat 6 patch cable - yellow
		1m Cat 6 patch cable - red

The Contractor shall provide the most recent versions/releases of all equipment and software, which may differ from the versions listed above.

***Location and Mounting***

The equipment shall be mounted in the existing SITSN Rack provided by FDOT ITS Central Office, located in the TERL equipment room.



### ***Power Connections***

No additional power connections are required; the existing chassis is in place and powered up.

### ***Network Connections***

Please refer to the COT Design and Configuration Document for network connection information and diagrams.

## **Tallahassee FHP Site (TFHP)**

### ***Summary***

TFHP is a Layer 3 network point of presence location for the Tallahassee Fiber Ring, and the FDOT Statewide Telecommunications Network.

A Nortel ERS-8606 in an existing rack will be upgraded to an Avaya ERS-8806. Two appropriate optical interfaces shall be provided for the existing fiber network. A copper Ethernet patch cord shall interconnect the TFHP SMS Connection and the 8806 (100 BASE-TX).

The 8806 shall be managed by the existing SITSN NMS.

### ***Equipment***

The equipment required for the TFHP installation is:

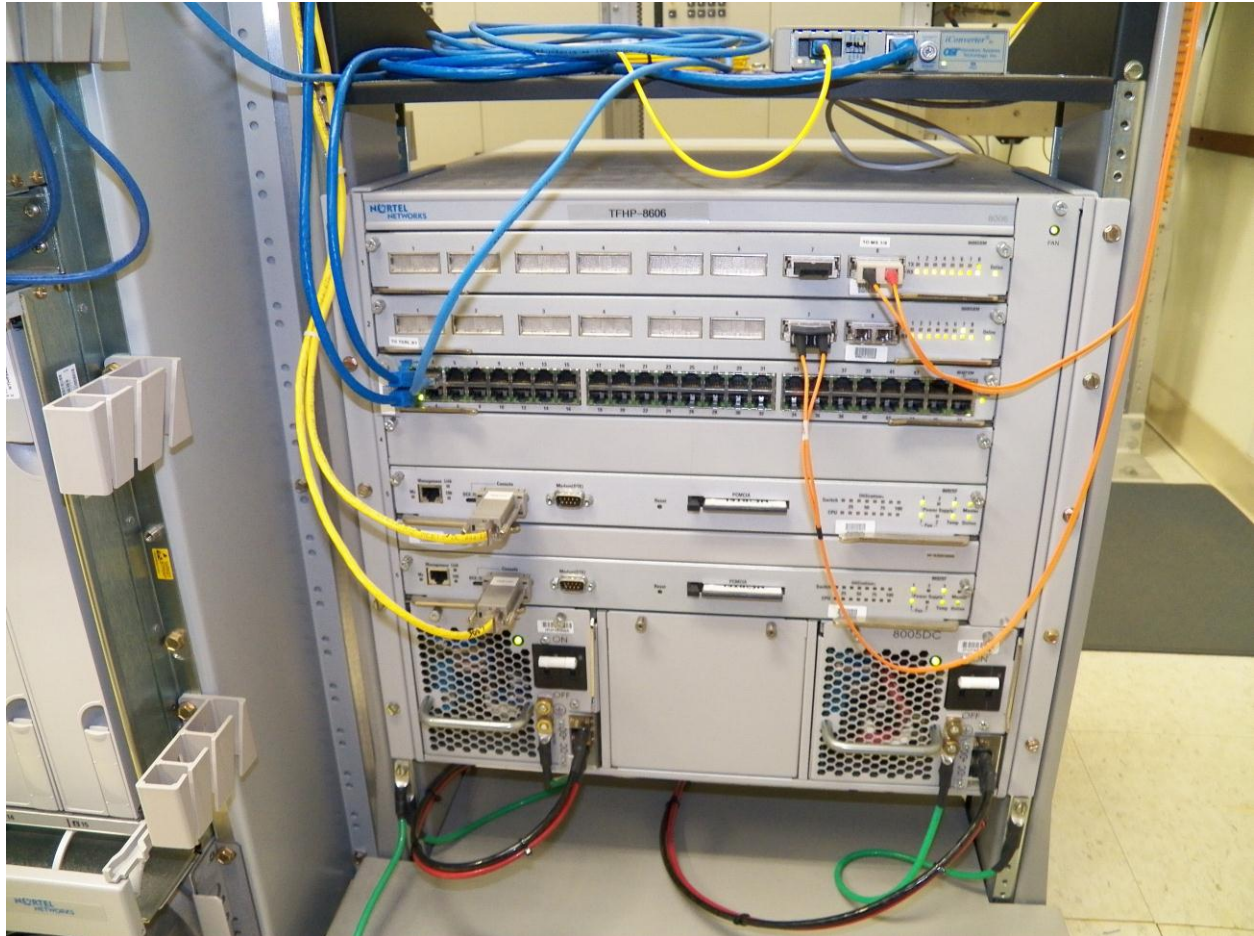
1	AA1403001-E5	1-port 10GBase-LR/LW XFP. LAN/WAN functionality based on port configuration/capability. Supports single-mode fiber for interconnects up to 10km.
1	AA1419048-E6	1-port 1000BASE-SX Small Form Factor Pluggable (SFP) Gigabit Ethernet Transceiver, connector type: LC. Digital Diagnostic Monitoring Interface.
2	AA1419049-E6	1-port 1000BASE-LX Small Form Factor Pluggable (SFP) Gigabit Ethernet Transceiver, connector type: LC. Digital Diagnostic Monitoring Interface.
2	DS1404120-E5	Ethernet Routing Switch 8895SF Switch Fabric/CPU to enable redundant terabit core configurations. One required with R/RS Modules, 2nd for load-sharing and redundancy. Operable with R/RS modules. Includes 1GB SDRAM and 2GB Compact Flash.
1	DS1404123-E6	8834XG Routing Switch Module. Combination module with 2 port 10GBase-X XFP, 24 port SFP (inc 100FX support) and 8 port autosensing 10BASE-T/100BASE-TX/1000Base-T baseboard (XFPs and SFPs purchased separately). The 8834XG requires the 8692wMezz or 8895S
1	DS1404124-E6	8848GT Routing Switch Module. 48 port autosensing 10BASE-T/100BASE-TX/1000Base-T Ethernet Layer 3 switching interfaces. 8848GT requires the 8692SFwMezz or 8895SF.
1	DS1410026	Ethernet Routing Switch 8800 Premier License Kit, for 1 chassis. Enabled features: Advanced features, VRF-Lite, MP-BGP, IP-VPN MPLS RFC2547, IP-VPN-Lite (IP-in-IP) & Mcast Virtualization for VRF-Lite (IGMP, PIM-SM/SSM). Refer to release notes for list of
1	DS1411018-E6	Spare 8006CMHS fan tray for 8006 chassis. Required for use with ERS8600 RS series modules and MERS8600 RC series modules. 8006 chassis uses 1 x DS1411018-E6.
		1m Cat 6 patch cable - blue
		1m Cat 6 patch cable - white
		1m Cat 6 patch cable - black
1		1m Cat 6 patch cable - purple
		1m Cat 6 patch cable - yellow
		1m Cat 6 patch cable - red

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The Contractor shall provide the most recent versions/releases of all equipment and software, which may differ from the versions listed above.

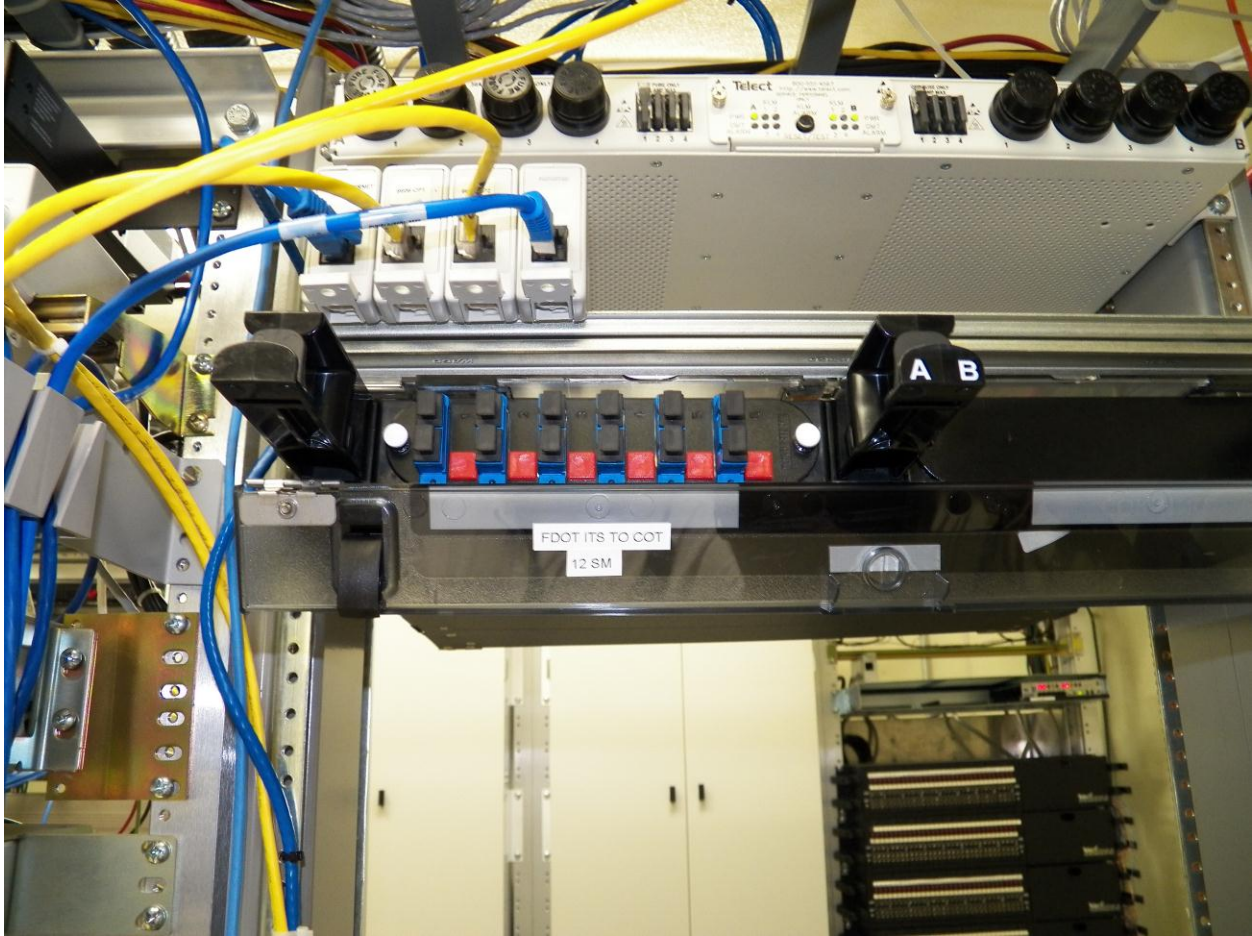
***Location and Mounting***

The equipment shall be mounted in the existing SITSN Rack provided by FDOT ITS Central Office, located in the TFHP equipment shelter.

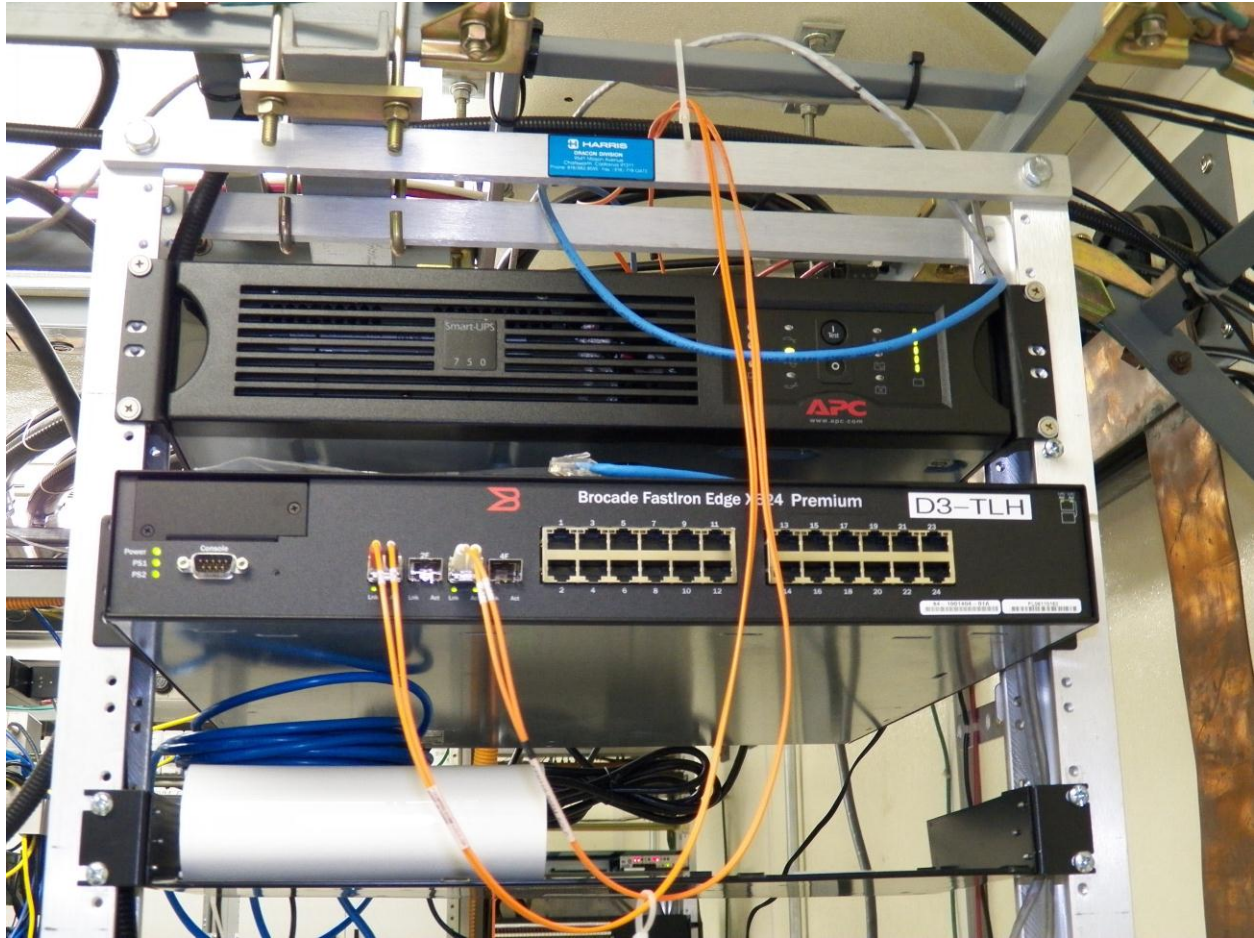


Fiber connectivity to the upgraded ERS-8806 will come from the patch panel, located in the same rack, and shown in the photograph below.





The Brocade FastIron layer 3 device shown in the photograph below will be removed from this site, and relocated to the Tallahassee PSC. Please note the installation details in the Tallahassee PSC section directly below.



***Power Connections***

No additional power connections are required; the existing chassis is in place and powered up.

***Network Connections***

Please refer to the COT Design and Configuration Document for network connection information and diagrams.

**Tallahassee Public Safety Complex (PSC)**

***Summary***

PSC is dual-purpose Layer 3 handoff and optical signal regeneration site providing OEO regeneration between TFHP to the west and the Rhyne Bldg to the east.

***Equipment***

The equipment required for the PSC installation is:

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2	AA1403001-E5	1-port 10GBase-LR/LW XFP. LAN/WAN functionality based on port configuration/capability. Supports single-mode fiber for interconnects up to 10km.
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1	AA1403013-E6	1-port 10GBASE-ER Small Form Factor Pluggable Plus (SFP+) 10 Gigabit Ethernet Transceiver, connector type: LC. Supports single-mode fiber for interconnects up to 40km.
2	AA1419049-E6	1-port 1000BASE-LX Small Form Factor Pluggable (SFP) Gigabit Ethernet Transceiver, connector type: LC. Digital Diagnostic Monitoring Interface.
1	AA1419048-E6	1-port 1000BASE-SX Small Form Factor Pluggable (SFP) Gigabit Ethernet Transceiver, connector type: LC. Digital Diagnostic Monitoring Interface.
1	AL1905E21-E6	Ethernet Routing Switch 4800GTS-PWR+ 1000W AC redundant power supply. EUED RoHS 6/6 compliant]. NA Power Cord
1	EC4400E05-E6	VSP 4450GSX with 12 10/100/1000 BaseT PoE+ ports, 36 1G SFP ports and two 10G SFP+ uplink ports. Inc. Base Software License, 1 Field replaceable 1000W PSU. NA Power Cord
1	EC4810015	VSP4000 PREMIER LICENSE - 1 UNIT
1	GE5300ERW	VSP 4K 4450 – Avaya Express Direct Delivered Technical Support Services – SLN ERW
		1m Cat 6 patch cable - blue
		1m Cat 6 patch cable - white
		1m Cat 6 patch cable - black
1		1m Cat 6 patch cable - purple
		1m Cat 6 patch cable - yellow
		1m Cat 6 patch cable - red

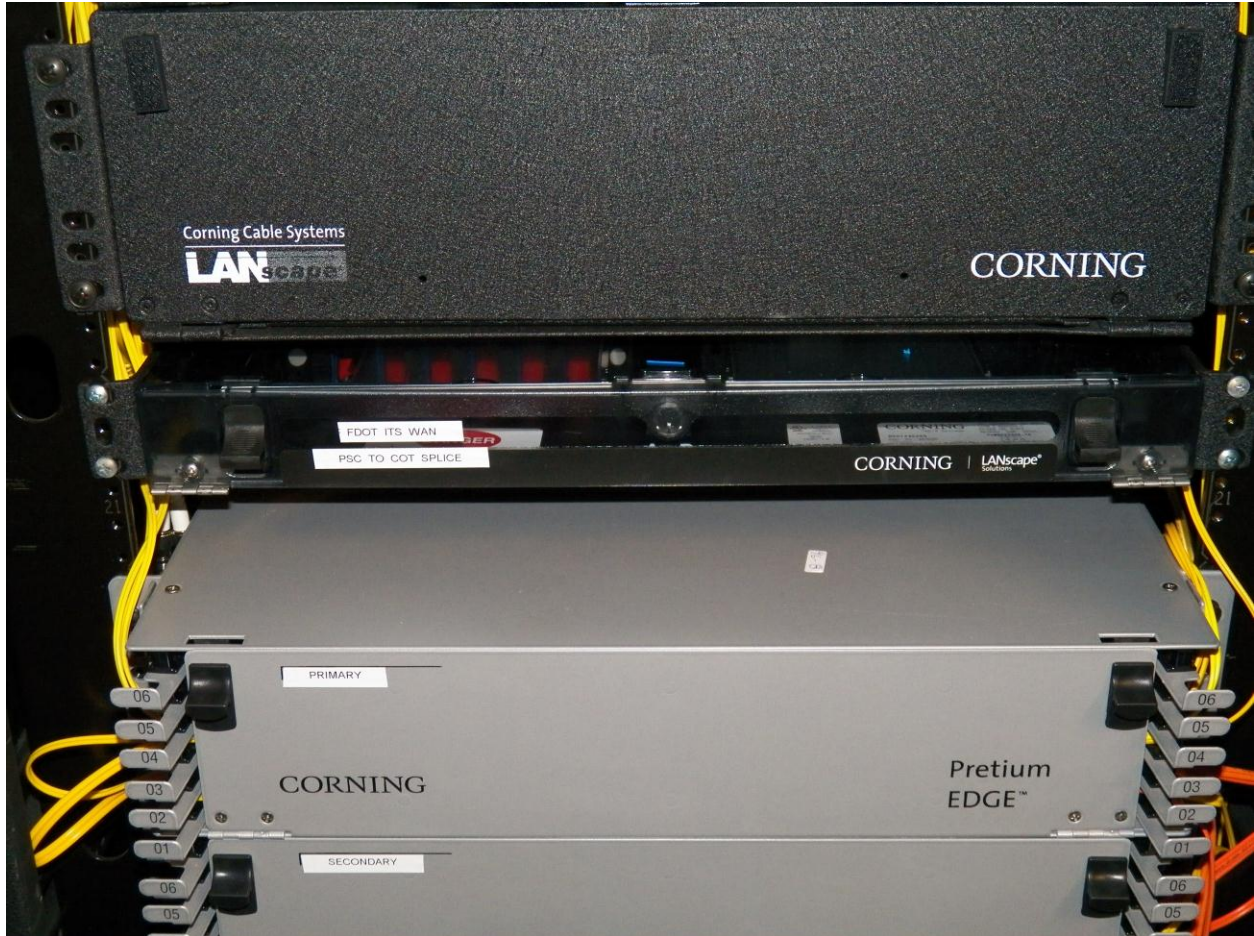
The Contractor shall provide the most recent versions/releases of all equipment and software, which may differ from the versions listed above.

### ***Location and Mounting***

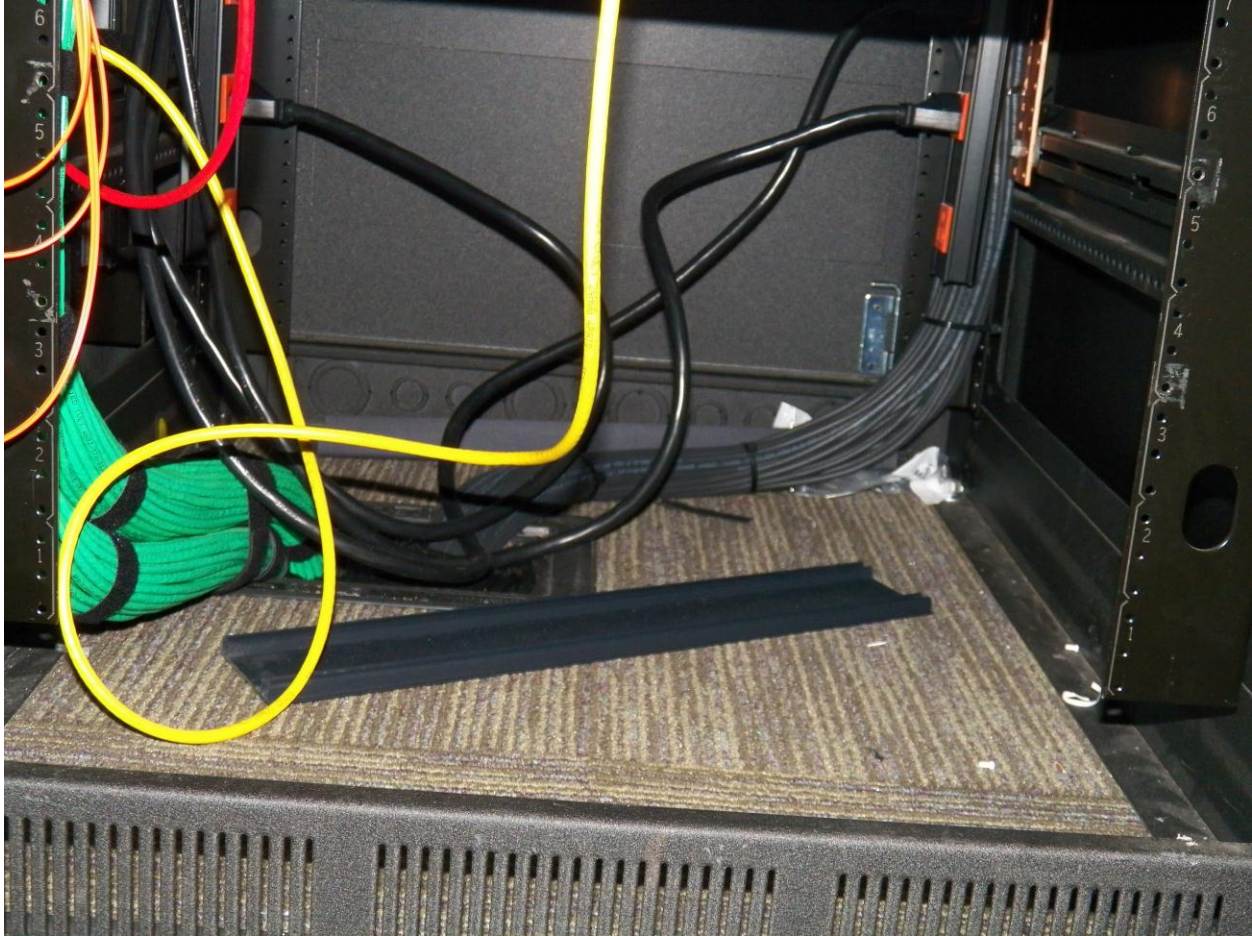
The equipment shall be mounted in the existing Racks #1 & 2, provided by the City of Tallahassee, located in Room 166 of the PSC.

The FDOT fiber ring termination point at this location is a 1U Corning LANscape fiber patch panel, located in Rack #1, and shown in the photograph below. Fiber patch cords are already present with the proper connector types for both the patch panel and equipment for the COT Fiber Ring. However, any multimode patch cords distance and connector types will have to be researched and provided by the Contractor.





The Avaya VSP-4450 switch and Brocade FastIron layer 3 device referenced above will be installed in rack units 5 and 6, and 2 and 3, respectively, at the bottom of Rack #2, as shown in the photo below.



### ***Power Connections***

The equipment shall be powered from the existing AC power distribution system in the PSC.

### ***Network Connections***

Please refer to the COT Design and Configuration Document for network connection information and diagrams.

## **FDOT ITS Central Office –Rhyne Bldg (Rhyne)**

### ***Summary***

An Avaya 4450 shall be installed in an existing wall-mounted cabinet located in the ESF-1 break-out room in the SEOC.

In addition to the COT Ring connection, there are seventeen (17) user ports that will be active at this location. All in house wiring and patch panels ports were tested and available for use.

### ***Equipment***

The equipment required for the Rhyne installation is:

2	AA1403001-E5	1-port 10GBase-LR/LW XFP. LAN/WAN functionality based on port configuration/capability. Supports single-mode fiber for interconnects up to 10km.
12	AA1419043-E6	1-port 1000BASE-T Small Form Pluggable (SFP), 8-pin modular connector (RJ-45).
1	EC4400E05-E6	VSP 4450GSX with 12 10/100/1000 BaseT PoE+ ports, 36 1G SFP ports and two 10G SFP+ uplink ports. Inc. Base Software License, 1 Field replaceable 1000W PSU. NA Power Cord
1	EC4810015	VSP4000 PREMIER LICENSE - 1 UNIT
1	GE5300ERW	VSP 4K 4450 – Avaya Express Direct Delivered Technical Support Services – SLN ERW
		1m Cat 6 patch cable - blue
		1m Cat 6 patch cable - white
		1m Cat 6 patch cable - black
1		1m Cat 6 patch cable - purple
		1m Cat 6 patch cable - yellow
		1m Cat 6 patch cable - red

The Contractor shall provide the most recent versions/releases of all equipment and software, which may differ from the versions listed above.

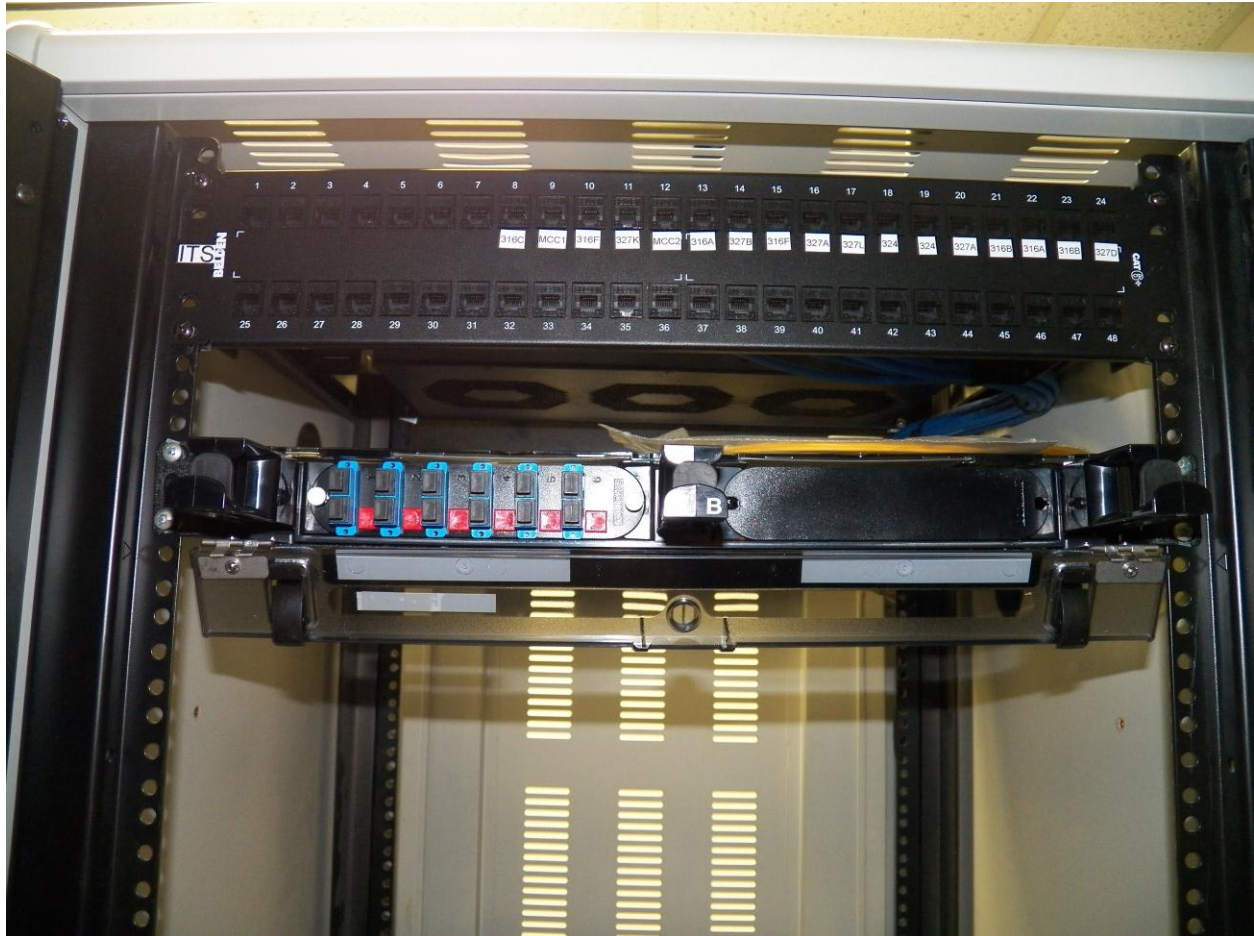
***Location and Mounting***

The equipment shall be installed in the existing SITSN Rack located in the Room 291F of the Rhyne Building. This room is the server closet for the facility. The SITSN Rack is the rack on the left side of the room (as one enters), and at the rear – it is shown in the photo below.





At the top of this cabinet, there is a 48-port patch panel. The contracted installers punched down the copper LAN drops beginning at port #24, as shown below.



Below the CAT 6 patch panel is a 1U space for the Avaya VSP-4450 being installed at this site. Cat 6 patch cables will be connected to this switch as described in Appendix A. A 1U Corning fiber patch panel is located beneath the space, and single-mode fiber jumpers will connect to the VSP-4450 as described in Appendix A.

#### ***Power Connections***

The equipment shall be powered from the existing AC power distribution system located in the Rhyne server equipment room.

#### ***Network Connections***

Please refer to the COT Design and Configuration Document for network connection information and diagrams.

### **Statewide Emergency Operation Center (SEOC)**

#### ***Summary***

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An Avaya 4450 shall be installed in an existing wall-mounted cabinet located in the ESF-1 break-out room in the SEOC. In addition to the COT Fiber Ring connections, there will be a limited number (six or fewer) user ports that will be active and turned up.

### ***Equipment***

The equipment required for the D1 installation is:

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1	AA1403001-E5	1-port 10GBase-LR/LW XFP. LAN/WAN functionality based on port configuration/capability. Supports single-mode fiber for interconnects up to 10km.
1	AA1403013-E6	1-port 10GBASE-ER Small Form Factor Pluggable Plus (SFP+) 10 Gigabit Ethernet Transceiver, connector type: LC. Supports single-mode fiber for interconnects up to 40km.
1	AL1905E21-E6	Ethernet Routing Switch 4800GTS-PWR+ 1000W AC redundant power supply. EUED RoHS 6/6 compliant]. NA Power Cord
1	EC4400E05-E6	VSP 4450GSX with 12 10/100/1000 BaseT PoE+ ports, 36 1G SFP ports and two 10G SFP+ uplink ports. Inc. Base Software License, 1 Field replaceable 1000W PSU. NA Power Cord
1	EC4810015	VSP4000 PREMIER LICENSE - 1 UNIT
1	GE5300ERW	VSP 4K 4450 – Avaya Express Direct Delivered Technical Support Services – SLN ERW

The Contractor shall provide the most recent versions/releases of all equipment and software, which may differ from the versions listed above.

### ***Location and Mounting***

The equipment shall be mounted in the existing SITSN cabinet provided by FDOT ITS Central Office, located in the SEOC, ESF-1 (Transportation) break-out room.

### ***Power Connections***

The equipment shall be powered from the existing AC power distribution system located in the SEOC, ESF-1 (Transportation) break-out room.

### ***Network Connections***

Please refer to the COT Design and Configuration Document for network connection information and diagrams.