

NOTICE TO CONTRACTORS  
OFFICE OF THE STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION  
801 N. BROADWAY AVENUE  
BARTOW, FLORIDA 33830

**September 13, 2011**

District Procurement Office  
District One

**ADDENDUM NUMBER FOUR**

PROJECT DESCRIPTION: I-75 Freeway Management System in Sarasota and Manatee Counties  
FINANCIAL PROJECT NO.: 414730-1-52-01, 414732-1-52-01 & 414736-1-52-01  
COUNTY: Sarasota and Manatee Counties  
CONTRACT NO.: E1J73

Request For Proposal	Page	
	1	<p>Introduction; added the following: <b>The FPN Numbers description of work and limits are as follows:</b></p> <ul style="list-style-type: none"> <li>• <b>FPID 414730-1-52-01, I-75 in Sarasota County from Charlotte County Line to Manatee County Line, design and construct a Freeway Management System</b></li> <li>• <b>FPID 414732-1-52-01, I-75 in Manatee County from Sarasota County Line to I-275, Manatee County, design and construct a Freeway Management System</b></li> <li>• <b>FPID 414736-1-52-01, Integrate the Freeway Management System installed under FPID 414730-1-52-01 and 414732-1-52-01 with the RTMC in Lee County and the Sarasota/Manatee County Satellite Transportation Management Center (STMC) in Manatee County.</b></li> </ul>
	3	<p>Section II, Schedule; revised the schedule as follows:  <b>Final deadline for submission of questions/information, September 19, 2011</b>  <b>Technical Proposals due September 27, 2011</b>  <b>Oral Interviews, November 15, 2011</b>  <b>Bid Opening, November 30, 2011</b>  <b>Final Selection December 13, 2011</b>  <b>Posting of intended Award, December 13, 2011</b>  <b>Anticipated Award, December 21, 2011</b>  <b>Anticipated Execution, January 31, 2012</b>  All original times for submittals, Oral Interviews and Bid Openings will remain the same</p>
	55	<p>Section VII, Technical Proposal Requirements, F. Stipend Awards, second paragraph, first sentence; replaced “<b>four</b>” with “<b>three</b>” for the number of originals to be returned.</p>

Minimum Technical Requirements (MTR)	3	List of Acronym, added the following: <b>AM Amplitude Modulation</b>
	4	List of Acronym, added the following: <b>TVSS Transient Voltage Surge Suppressor</b>
	5	Section 1.0, Introduction, added the following to the first paragraph: <b>The following projects make up this contract:</b> <ul style="list-style-type: none"> <li>• <b>FPID 414730-1-52-01, I-75 in Sarasota County from Charlotte County Line to Manatee County Line, design and construct a FMS;</b></li> <li>• <b>FPID 414732-1-52-01, I-75 in Manatee County from Sarasota County line to I-275, design and construct a FMS; and</b></li> <li>• <b>FPID 414736-1-52-01, Integrate the FMS installed under FPID 414730-1-52-01 and 414732-1-52-01 with the Regional Transportation Management Center (RTMC) in Lee County and the Sarasota/Manatee STMC in Manatee County.</b></li> </ul>
	5	Section 1.0 Introduction, added the following to the second paragraph, first bullet: <b>Intelligent Transportation System</b>
	5	Section 1.0 Introduction, fourth paragraph, revised the last sentence as follows: The Design-Build Firm is responsible for all other integration related tasks as shown in the <b>SunGuide Implementation Plan</b> .
	5	Section 1.0 Introduction, fifth paragraph, second line, added to the middle of the sentence <b>power drops</b> and deleted <b>and</b>
	6	Section 1.2, General Testing Requirements, added the following to the beginning of the third paragraph: <b>The Design-Build Firm shall develop a comprehensive test plan, submit it for approval by the Engineer, incorporate all of the Engineer's comments, execute the plan, and document the results.</b>
	6	Section 1.2, General Testing Requirements, paragraph five, revised the first sentence as follows: The Design-Build Firm shall not begin <b>testing</b> until the Department has approved the Test Plan and <b>Test Evaluation Matrix</b> , including detailed procedures and data forms.
	7	Section 1.2 General Testing Requirements, top paragraph, revised the last sentence as follows:;, as well as the requirements defined in <b>this MTR</b> for <b>each</b> subsystem/component .
	7	Section 1.2, General Testing Requirements, revised the third paragraph as follows: Testing of the equipment and system shall include, in the following order, each preceding test must be satisfactorily completed and accepted before subsequent test(s) may <b>begin</b> :
	7	Section 1.2.2 stand-alone test, revised the second paragraph as follows: The Stand-alone Test shall exercise all stand-alone (non-network) functional operations of the <b>ITS</b> device and ancillary components installed at the <b>device site</b> .
	8	Section 1.2.4, Operational Test, first paragraph, revised the first sentence as follows: <b>The Design-Build Firm shall plan, implement and document the Operational Test.</b> Deleted the second sentence in its entirety.

	8	Section 1.2.4, Operational Test, revised the fourth paragraph as follows: In the event of a subsystem, ITS device, or ancillary component failure, with the exception of consumable items such as fuses, the Operational Test shall be shut down for purposes of testing and correcting identified deficiencies, <b>otherwise known as System Shutdown</b> . System Shutdown is defined as any condition which, due to <b>manufacturer defect or workmanship deficiencies</b> results in any subsystem, ITS device, or ancillary component of the Sarasota and Manatee I-75 FMS Project to cease operation or <b>lose functionality</b> . <b>The Department reserves the right to determine that a System Shutdown is required.</b>
	9	Section 1.2.4 Operational Test, on this page delete and replace the sixth paragraph with the following: <b>All software required for diagnosing malfunctions of hardware and software/firmware shall be supplied by the Design-Build Firm. Diagnostic software shall not be installed on Department workstations or servers at the SWIFT Center. The Design-Build Firm will not be required to submit the diagnostic software for the Department's approval.</b>
	10	Section 1.2.5, Burn-in Period, revised the third paragraph on this page as follows: In the event of a subsystem, ITS device, or ancillary component failure, with the exception of consumable items <b>such as fuses</b> , the <b>Burn-In Period</b> shall be shut down for purposes of testing and correcting identified deficiencies <b>otherwise known as System Shutdown</b> . System Shutdown is defined as any condition, which due to <b>manufacturer defect or workmanship deficiencies</b> results in any subsystem, ITS device or ancillary component of the Sarasota and Manatee I-75 FMS Project to cease operation or <b>lose functionality</b> . <b>The Department reserves the right to determine that a System Shutdown is required</b>
	10	Section 1.2.5 Burn-in Period, revised the sixth paragraph of this page as follows: The Burn-In Period steps described herein shall be repeated as many times as deemed necessary by the Department <b>to completely demonstrate that the Design-Build Firm's work satisfies the requirements of this MTR and all other requirements of the Contract.</b>
	10	Section 1.2.6, Final Acceptance, second paragraph, revised the sentence as follows: <b>The Department shall issue</b> Final Acceptance <b>based</b> on the Department's final inspection of the entire Sarasota and Manatee I-75 FMS Project, and as deemed by the Department
	10	Section 1.2.6, Final Acceptance, added the following after the second paragraph: <b>All hardware and software provided by the Design-Build Firm shall have the latest stable firmware and any necessary upgrades available at the time of Final Acceptance.</b>
	10	Section 1.2.6, Final Acceptance, last paragraph of the section, revised it as follows: <b>The Department shall perform the</b> final inspections of the entire Sarasota and Manatee I-75 FMS Project in the presence of a representative of the Design-Build Firm.
	11	Section 1.3 SunGuide Software Compatibility, after the first paragraph, inserted the following; <b>The Design-Build Firm shall procure all licenses for the Oracle software in the Department's name. The Department anticipates that the Design-Build Firm shall purchase four (4) Oracle licenses for the Microsoft Clustering Group at the STMC; however, the Design-Build Firm is responsible for determining the correct number of licenses. The Design/Build Firm shall purchase any necessary renewals for the Oracle licenses to extend the expiration date through one year after Final Acceptance.</b>

	13	Section 1.3.1, Device Protocol Compliance, paragraph after the table, revised the first sentence after devices by adding <b>or other necessary software revisions</b> . Same paragraph, last sentence added Central <b>Office and the</b> for coordination requirements.
	13	Section 1.3.2 Network Infrastructure, first paragraph, second sentence, deleted 5 and replaced it with <b>11</b> ; third paragraph, first sentence, replaced which with <b>that</b> ; second sentence, replaced will with <b>shall</b> .
	13	Section 1.3.2 Network Infrastructure, third paragraph, first sentence, replaced which with <b>that</b> ; second sentence, replaced will with <b>shall</b> .
	13	Section 1.3.2 Network Infrastructure, added the following to the beginning of the fourth paragraph: <b>The Design-Build Firm shall develop an integration plan to include that details all equipment, software and scheduling to occur during the integration portion of the project.</b>
	16 & 17	Section 1.3.3 Device Worksheets, the two paragraphs after Table1.5 were revised as follows: The Design-Build Firm shall be responsible for providing all data necessary to populate the SunGuide® database. The Design-Build Firm shall coordinate with and provide this data to the SWIFT Center IT Manager in accordance with a mutually agreeable format and schedule <b>as determined in the Pre-Integrations meeting</b> . No additional contract time or cost will be provided to the Design-Build Firm for this effort. The SWIFT Center IT Manager will enter the appropriate data into the SunGuide® database. The Design-Build Firm <b>shall</b> be responsible for observing and verifying that the <b>SWIFT Center IT Manager enters the</b> correct data. At no time will the Design-Build Firm be granted SunGuide® administrative rights to the Department's SWIFT SunGuide® Software System.  The database developed and installed by the Design-Build Firm at the Sarasota-Manatee STMC shall be a duplicate of the complete database at the SWIFT Center, including the information on the existing Collier/Lee/Charlotte County devices. This shall also include Microsoft Clustering <b>by</b> Design-Build Firm personnel whose experience with Microsoft Clustering has been reviewed and approved by the Engineer.
	19	Section 1.6, Warranty, third paragraph was revised as follows: <b>Any components not covered under the FDOT Standard Specifications, Supplemental Specifications, or this MTR shall have a one year warranty provided by the Design-Build Firm</b> . If the manufacturer's warranties for project <b>components</b> are for a longer period, those warranties shall continue to apply.
	20	Section 1.7 Maintenance Agreements, revised the first paragraph as follows: <b>At the conclusion of the project</b> and concurrent with Final Acceptance, the Design-Build Firm shall provide agreement(s) to maintain all equipment installed under this contract for a period of one year at no additional cost to the Department. <b>The Design-Build Firm's maintenance agreement shall provide a point of contact that can be reached by telephone and/or electronic communications</b> 24 hours/day 7 days/week and a knowledgeable technical person at the site of the failure within 4 hours of <b>notification</b> .
	20	Section 1.7 Maintenance Agreements, last paragraph of the page, added the following sentence between sentence two and three: <b>This meeting shall occur 45 days prior to the end of the Maintenance Agreement term.</b>

	21	<p>Section 2.0 Enhancements to the Sarasota-Manatee County Satellite Transportation Management Center (STMC), revised the first paragraph as follows: The following are the requirements for the enhancements to the Sarasota-Manatee STMC and connection to the SWIFT Center. Entry into the STMC <b>shall</b> require a pass issued by the STMC Operator (<b>Manatee County</b>). The STMC Operator will <b>issues</b> passes only after a complete <b>background</b> check, including fingerprinting, of each applicant. Since the time to complete the required checks depends on the background of the applicant, it is not possible to state the time required to complete the check. The Design-Build Firm <b>shall</b> include this <b>time in their schedule</b> as no additional time will be granted for <b>processing of STMC pass requests</b>.</p>
	21	<p>Section 2.2. Communication Equipment, deleted the entire section and replaced it with the following: <b>The Design-Build Firm shall install a new Gigabit Ethernet switch at the Sarasota-Manatee STMC, the same as or equivalent to the Gigabit Ethernet switch (NetIron MLX-4 Router and FastIron WS648G Switches) to be provided at the SWIFT Center per section 3.2 of this MTR. One Gigabit Ethernet port shall connect directly to the SWIFT Center’s Core Gigabit Ethernet switch via a pair of dedicated fiber strands within the I-75 FMS fiber optic cable. Three Gigabit Ethernet ports shall connect to the three closest FMS field hub switches using three separate pairs of dedicated fiber strands within the I-75 FMS fiber optic cable.</b></p> <p><b>The Design-Build Firm shall provide a 45 Megabit internet connection, for the exclusive use of the FDOT, at the STMC. It shall be available to and at all FDOT workstations and back office locations. This connection shall be provided as necessary to meet the requirements of the Sarasota-Manatee STMC and shall be maintained until the date of Final Acceptance.</b></p> <p><b>The Design-Build Firm shall provide a new firewall that is fully compatible with the existing SWIFT Center firewall, including but not limited to Software Blade Architecture, Site to Site VPN, IPS, Advanced Routing, High Performance, and Web Security. This firewall shall include four 2-port 1000Base-SX Ethernet SFP cards. A datalink between the two firewalls shall be configured to provide a redundant path between the SWIFT Center and the Sarasota-Manatee STMC. This work shall include the configuring of any VPNs necessary for creating a redundant ring between the two RTMCs.</b></p>
	22	<p>Added the following section header between paragraph one and two of the old 2.2 Communication Equipment section and revised the first paragraph as follows:</p> <p><b>2.3 Network Infrastructure</b></p> <p><b>The Design-Build Firm shall install a new set of I-75 FMS servers at the Sarasota-Manatee STMC, in four new server racks (not network racks) and identical in performance and number to the existing set of I-75 FMS servers at the SWIFT Center. The new racks shall have front and back mesh doors that are lockable with two keys per rack and all keyed alike. The cable ladder over the existing racks shall be extended over the new racks. Each rack shall consist of two (eight total) Power Distribution Units that shall provide power distribution to each server rack. These new Sarasota-Manatee STMC servers shall work as hot stand-by servers in case the SWIFT Center SunGuide® servers fail or there is a loss of connectivity with the SWIFT Center. All of the current and future I-75 FMS devices</b></p>

		and all of the current and future SunGuide® operators shall be identical in both sets of server databases. The databases of these new servers shall automatically and dynamically synchronize with the servers of the SWIFT Center using the Gigabit Ethernet connectivity over the I-75 FMS fiber optic cable. The Sarasota-Manatee STMC servers shall be part of a Microsoft Clustering group for the SunGuide® Software System. The Design-Build Firm is responsible for the design, procurement, installation and integration of all necessary equipment to provide the above configuration. This shall include all ancillary components not specifically detailed, but necessary to make the system function as intended.
	22	Section 2.3 Network Infrastructure, fourth paragraph, deleted three and replaced it with <b>four</b>
	23	Renumbered Section 2.3 Video Wall to <b>2.4 Video Wall Display</b>
	23	<p>Section 2.4 Video Wall Display, deleted the entire section and replaced it with the following: <b>At the Sarasota-Manatee STMC, there shall be two independent video wall systems with their dedicated video wall controllers and video display cubes. One video wall system is dedicated to the operation of the Manatee and Sarasota Counties ATMS and has been installed by others. The second video wall system is dedicated to the operation of the I-75 FMS and shall be designed, procured, installed and integrated by the Design-Build Firm. There shall be no commonalities between these two video wall systems, except that they share the same physical wall.</b></p> <p><b>To display the images from the FMS devices, the Design-Build Firm shall expand the existing video wall with 12 new display cubes similar to the existing cubes, together with ancillary equipment and cabling, so that the entire wall appears as one unit. A separate video wall controller compatible with the SunGuide® software and on the Approved Products List (APL) shall be provided. A software-based controller installed on servers is acceptable as long as it meets the requirements herein and is included on the APL.</b></p> <p><b>The Design-Build Firm shall install twelve new four-channel decoder cards, dedicated to displaying 48 simultaneous I-75 FMS CCTV camera images on the new video wall. Each of the 12 video cards shall decode both MPEG-2 and MPEG-4 video streams and be configured to decode four simultaneous MPEG-2 video streams. In addition, each of these 12 decoder cards shall decode, or shall be firmware upgradable to decode H.264 video streams. The 12 cubes within the new video wall must each display 4 images simultaneously and tour (or scroll) through a total of 200 CCTV camera images.</b></p> <p><b>The support structure for the 12 cubes shall support 4 additional cubes which will be installed later by others.</b></p> <p><b>As part of the video wall installation, the Design-Build Firm shall remove the existing curtain covering the space intended for the 12 FDOT cubes, leave the upper curtain over the entire wall, and fill any gaps or holes in the wall surrounding the new displays and the existing ATMS video wall to provide a finished look that appears as one unit. This finished look shall incorporate a frame similar to that at the SWIFT Center.</b></p>

		<p><b>The Design-Build Firm is responsible for protecting their equipment within the Sarasota-Manatee STMC as the video wall system is installed. The Design-Build Firm shall be responsible for repairing any damage it causes to the existing facilities in the Sarasota-Manatee STMC, performing the repairs within the current contract time at no additional cost.</b></p>
	23	<p>Added <b>Section 2.4.1 Video Wall Control</b></p> <p><b>The Design-Build Firms shall provide video wall control that configures the display format of the video images on the video wall display. The video wall control shall include:</b></p> <ul style="list-style-type: none"> <li>• <b>Video wall management system software</b></li> <li>• <b>Remote control system</b></li> <li>• <b>Touch panel key pad system including:</b> <ul style="list-style-type: none"> <li>○ <b>Hardwire touch panel</b></li> <li>○ <b>Wireless touch panel</b></li> </ul> </li> </ul>
	23	<p>Renumbered 2.4 Workstation to <b>Section 2.5 Workstations</b> added/revised the following:</p> <p>The Design-Build Firm shall provide <b>11</b> new SunGuide® FMS workstations dedicated to I-75 FMS usage at the Sarasota-Manatee STMC. <b>The five workstations in the control room shall have four 22” LCD monitors and the six back office workstations shall have three 22” LCD monitors.</b> The hardware of these new workstations shall be configured as regular SunGuide® clients of the SWIFT Center, identical to the I-75 FMS client workstations located at the SWIFT Center. The Design-Build Firm is responsible for all necessary power and communications necessary to integrate these workstations into the I-75 FMS network.</p> <p>These workstations shall meet or exceed the following minimum specifications:</p> <ul style="list-style-type: none"> <li>• Intel Core 2 Quad Q9650 3.0 GHz or better CPU</li> <li>• Video card(s) to handle 4 monitors</li> <li>• At least 8 GB of RAM</li> <li>• At least 150 GB hard drive</li> <li>• DVD/CDROM drive</li> <li>• 10/100/1000 Network Interface card</li> <li>• Keyboard and mouse</li> <li>• Speakers</li> </ul> <p>These workstations shall have the following minimum software installed:</p> <ul style="list-style-type: none"> <li>• Windows 7 Professional 64 bit Operating System</li> <li>• All Windows 7 updates and security patches</li> <li>• Microsoft Office Professional (Latest Version)</li> <li>• Adobe Reader (Latest Version)</li> <li>• The Design-Build Firm <b>shall coordinate with the SWIFT Center Operations Manager and IT Manager</b> to have Symantec Endpoint Protection installed and to ensure that the workstations provided are properly configured to accept the SunGuide® software.</li> </ul> <p><b>The Design-Build Firm shall provide 24 wireless headsets, each with one earphone and a microphone. The microphones shall be configured into the network to permit each workstation operator to record HAR messages and</b></p>

		<p>511 floodgate messages and listen to existing department emergency management scanners over the internet via software provided by the Department.</p>
	24	<p>Added <b>Section 2.6 Printer, Copier, Scanner and Fax</b>, deleting the original requirements and replaced them with the following:</p> <p><b>The Design-Build Firm shall provide two all-in-one (AIO) multifunction printer/copier/scanner/fax combinations connected to the network to provide centralized document management, distribution and production. One AIO shall be located in the back office area and one shall be located on the control room floor. The AIOs shall meet the following minimum requirements:</b></p> <p><b>General Features:</b></p> <ul style="list-style-type: none"> <li>• 30-sheet document feed;</li> <li>• 150-sheet input capacity;</li> <li>• 125-sheet output capacity;</li> <li>• Media sizes: Envelope, ledger, letter, and legal; and</li> <li>• Media type: Paper (standard, light, intermediate, heavy, glossy and high gloss), envelope, cardstock, transparent label.</li> </ul> <p><b>Printer Features:</b></p> <ul style="list-style-type: none"> <li>• Black and white; and</li> <li>• Duplex printing from single side documents.</li> </ul> <p><b>Copier Features:</b></p> <ul style="list-style-type: none"> <li>• Black and white;</li> <li>• Copy settings: contrast, resolution, reduction/enlargement, number of copies, paper size;</li> <li>• Duplex copying from single side copies; and</li> <li>• Reduction/enlargement: 25-400%.</li> </ul> <p><b>Scanner Features:</b></p> <ul style="list-style-type: none"> <li>• Color;</li> <li>• Simplex and duplex; and</li> <li>• Flatbed and sheet fed.</li> </ul> <p><b>Fax Features:</b></p> <ul style="list-style-type: none"> <li>• Auto redial;</li> <li>• Fax forwarding;</li> <li>• Fax auto reduction;</li> <li>• Distinctive ring detection;</li> <li>• 120 speed dials; and</li> <li>• 120 broadcast/group dials.</li> </ul>
	25	<p>Section 2.5, Electrical Requirements was deleted and renumbered as <b>Section 2.7, Electrical Equipment</b>.</p> <p>Fourth sentence was revised as follows: The Design-Build Firm shall document the effect the <b>proposed</b> loads will have on the existing system as far uplink as the main building electrical disconnect switch.</p>

	25	<p>Section 2.6 Furniture Requirement was deleted and renumbered as <b>Section 2.8 Furniture Requirements</b></p> <p>The entire section was deleted and replaced with the following:  <b>Per Section 946.515 (2), F.S., furniture purchases must be made from PRIDE unless a “reasonable determination” can be made that the product available from PRIDE does not meet the performance specifications, comparable price and quality requirements of the agency. The “reasonable determination” must state the specific deficiencies or shortcomings in quality and/or disparity in pricing of the PRIDE products. The Design-Build Firm shall use Form No. <a href="#">375-040-66</a> to document the determination and include with the project documentation.</b></p> <p><b>This is the website Uniform Resource Locator (URL) for the PRIDE furniture estore. Furniture selections are at the left of the page.</b></p> <p><b><a href="http://www.prideestore.com/Pridestore/Products/Furniture/Default.aspx">http://www.prideestore.com/Pridestore/Products/Furniture/Default.aspx</a></b></p> <p><b>If the Design-Build Firm determines that furniture cannot be purchased from PRIDE, they shall use a state contract for the procurement. If the product needed is not available from either PRIDE or State Contract, the Design-Build Firm must document this by using Form No. <a href="#">375-040-02</a>.</b></p> <p><b>State contracts available for the purchase of furniture:</b>  <b><a href="http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contract_s/furniture_office_and_files">http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contract_s/furniture_office_and_files</a></b></p> <p><b><a href="http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contract_s/furniture_educational_institutional">http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contract_s/furniture_educational_institutional</a></b></p> <p><b><a href="http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contract_s/furniture_library">http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contract_s/furniture_library</a></b></p> <p><b>The Design-Build Firm shall provide furniture for the five back offices and the administrative assistant area.</b></p> <p><b>Each of the five offices shall contain:</b></p> <ul style="list-style-type: none"> <li>• A six foot wide desk with a four foot return;</li> <li>• A 5-way adjustable desk chair;</li> <li>• A guest chair;</li> <li>• A 4-drawer file cabinet that accepts legal size files; and</li> <li>• A 4-shelf bookcase.</li> </ul> <p><b>The TMC Manager’s office shall have an additional guest chair. The administrative assistant area shall contain a counter with writing area that is installed to close off the area from the walkway. The furniture quality shall be equal to or better than that in use at the SWIFT Center.</b></p>
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	26	<p>Section 2.7 Warranty was renumbered as <b>Section 2.9 Warranty</b> and the section was replaced with the following:</p> <p><b>The Design-Build Firm shall provide a manufacturer’s warranty(s) for materials as described in this document. The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.</b></p> <p><b>System components shall be warranted against all defects and/or failure in design, materials, and workmanship for the minimum warranty duration specified for each item of equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786 or this MTR, whichever is greater.</b></p> <p><b>If the manufacturer’s warranties for the components are for a longer period, those warranties shall continue to apply.</b></p> <p><b>All hardware requires a three-year service plan agreement for next business day parts and service from the date of Final Acceptance. All software, except the Oracle software, requires three years of licensing and telephone customer support from the date of Final Acceptance.</b></p> <p><b>The Department reserves the sole right to determine defects in the materials and systems installed or modified by this project and the acceptability of the warranty repair and defect correction, including adjustment of equipment provided as a part of this project.</b></p>
	27	<p>Section 3.0 Improvements to the SWIFT Center, Revised the first paragraph as follows: The Design-Build Firm shall provide the following improvements to the SWIFT Center. These improvements shall be documented as part of an overall integration plan as <b>detailed in section 1.4.1 of this MTR</b>. The Design-Build Firm’s activities in the <b>SWIFT Center control room</b> shall be limited to the time between 10:00 AM and 2:00 PM or <b>between 7:00 PM and 5:00 AM</b> the next day on week days. There are no prohibited hours on non-holiday weekends. The maximum time that the center can be “down” is 4 hours in any 24-hour period <b>and only during the hours shown above</b>.</p>
	27	<p>Section 3.1 Video Wall Controller Upgrades, deleted the first two paragraphs and replaced them with the following:</p> <p><b>There is an existing Barco Transform A-18 Video Wall Controller (VWC) at the SWIFT Center. The Design-Build Firm shall provide a new VWC compatible with the SunGuide® software and on the Approved Products List (APL) to integrate the new and existing CCTV camera images into the SWIFT Center video wall and to provide for the following:</b></p> <ul style="list-style-type: none"> <li>• <b>The 15 cubes in the video wall must display 4 images simultaneously and tour (or scroll) through a total of 200 CCTV images</b></li> <li>• <b>Switching capability must be installed and available for two existing large screen monitors – one in the lobby and one in the downstairs conference room</b></li> <li>• <b>Switching capability must be installed and available for 6 future large screen monitors</b></li> <li>• <b>Decoding of MPEG-2, MPEG-4, and H.264 video streams</b></li> </ul> <p><b>A software-based controller installed on servers is acceptable as long as it</b></p>

		<p>meets the requirements herein and is included on the APL. All controllers must be capable of integration with SunGuide®.</p> <p>Added the following paragraph to the section: <b>There is an existing Crestron control system at the SWIFT Center that includes a hardwired touchpanel, a wireless touchpanel and a media controller. The Design/Build Firm shall reintegrate this system with the new video wall controller or provide an alternate solution for approval by the Department.</b></p>
	27	<p>Section 3.2, Standby Switch, revised the paragraph as follows:  <b>The Design-Build Firm shall provide a new switch for the SWIFT Center with a minimum of 40 fiber ports (1 Gig each) and a minimum of 96 copper ports 10/100/1000 Layer-2. This switch shall mirror the current core switch that consists of a Layer-3 router and 2 Layer-2 switches with 48 copper ports each. This switch is intended as a backup to the core switch and will be installed by others.</b></p>
	27	<p><b>Deleted the entire Section 3.3 Integration Plan</b></p>
	27	<p>Renumbered Section 3.4 Warranty to <b>Section 3.3 Warranty</b> and revised the entire section as follows:  <b>The Design-Build Firm shall provide a manufacturer’s warranty(s) for materials as described in this document.</b></p> <p><b>System components shall be warranted against all defects and/or failure in design, materials, and workmanship for the minimum warranty duration specified for each item of equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786 or this MTR, whichever is greater.</b></p> <p><b>If the manufacturer’s warranties for the components are for a longer period, those warranties shall continue apply.</b></p> <p><b>The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.</b></p> <p><b>All hardware requires a three-year service plan agreement for next business day parts and service from the date of Final Acceptance. All software, except the Oracle software, requires three years of licensing and telephone customer support from the date of Final Acceptance.</b></p> <p><b>The Department reserves the sole right to determine defects in the materials and systems installed or modified by this project and the acceptability of the warranty repair and defect correction, including adjustment of equipment provided as a part of this project.</b></p>
	29	<p>Section 4.1 Description, second paragraph, second sentence, added <b>new and existing</b> and <b>deleted</b> the last bullet item Camera placement at interchanges ....</p>
	30	<p>Section 4.1.4, Camera Site, first sentence, added <b>a centrifugally cast</b>, to the pole description.</p>
	30	<p>Section 4.2, Design requirements, paragraph one, first sentence, added <b>and the arterial cross streets</b></p>
	31	<p>Section 4.2 Design Requirements, fifth paragraph of this page, revised the last sentence to read <b>The maximum CCTV camera mounting height shall be 65 feet above ground level.</b></p>

	31	Section 4.3 Functional Requirements, added the following sentence to the bottom of the section, <b>Maintenance and construction of an installed assembly shall not require lane closures.</b>
	32	Section 4.5.1, Pole, <b>deleted the last paragraph of this section in its entirety.</b>
	33	Section 4.7 Testing Requirements, second paragraph, first bullet, revised the last sentence as follows: <b>The Design-Build Firm shall provide the laptop computer, software decoder, and the NTCIP PTZ control program.</b>
	33	Section 4.7, Testing Requirements, second paragraph, third bullet, revised the first sentence as follows: <b>Operational Test of the Complete System: This test shall be performed at the SWIFT Center and the STMC utilizing the SunGuide® System Software over the Ethernet Network running on a SunGuide® client machine to ensure the encoded MPEG-2 streams are decoded, a remote test of the PTZ functions and at least three presets are working correctly.</b>
	35	Section 5.1 Description, revised the entire section as follows: <b>The existing I-75 FMS field communications backbone consists of a gigabit Ethernet network connecting the SWIFT Center to localized hub sites. These hub sites act as aggregation points for edge switches located at CCTV cameras, DMSs, and other remote sites. All hub switches shall be gigabit Ethernet (1000Mbps) compatible.</b>  <b>An Ethernet edge switch with a minimum of two single mode fiber optic ports shall be used at all fiber drop locations where an optical signal needs to be converted into an electrical (Ethernet) signal. All edge switches shall be fast Ethernet compatible.</b>  <b>A subset of an Ethernet edge switch is the media converter. The Design-Build Firm shall determine the required number of single mode fiber ports and 10/100 BaseT (copper) ports needed at locations which require a media converter.</b>
	35	Section 5.2.1, General, added the following to the end of the second paragraph: <b>in conjunction with the SWIFT Center IT Manager.</b>
	36	Section 5.2.3, Ethernet Hub Switch, first paragraph, the second sentence was revised as follows: The <b>hub switches</b> shall act as aggregation points for <b>the</b> edge switches located at CCTV camera sites, DMS sites, MVDS sites, RWIS sites, HAR transmitter and beacon sites, and similar remote locations. ,
	36	Section 5.2.3, Ethernet Hub Switch, first paragraph, the third sentence, deleted 'with the location' and replaced it with <b>as</b>
	37	Section 5.2.3, Ethernet Hub Switch, <b>deleted the last sentence of second paragraph of this page, 'The connector shall be ...'.</b>
	42	Section 6.0 Dynamic Message Signs Added the following: <b>The Design-Build Firm shall install Dynamic Message Signs (DMS) as part of this project.</b>
	42	Section 6.1 Design Requirements, inserted the following after paragraph seven: <b>The DMS structure shall include a catwalk for access to the inside of the sign from the edge of the roadway. The catwalk shall be designed as shown in FDOT Design Standards Index No. 18302.</b>
	43	Section 6.2 Functional Requirements, inserted after the second paragraph the following: <b>The DMS shall be programmed to display 25 characters on each of the 3 lines of text.</b>

	44	Section 6.3.2 Deliverables, first paragraph, added fourth bullet <ul style="list-style-type: none"> <li>• <b>DMS software for configuration management and diagnostic troubleshooting</b></li> </ul>
	45	Section 6.4 Training and Manual Requirements, <b>deleted the training site</b> in the last bullet.
	45	Section 6.4.3 Manufacturers Qualifications, revised the first sentence as follows: <b>The Traffic Engineering Research Laboratory (TERL) shall certify the DMSs before submission for approval.</b>
	45	Section 6.4.3 Manufacturers Qualifications, first paragraph, deleted the last referenced 18 and replaced it with <b>25</b> .
	46	Section 7.1.1 Conduit, first paragraph, last sentence, added <b>Fiber Optic</b> to the beginning of the sentence.
	49	Section 7.5.2, Fiber Optic Cable Splicing, second paragraph, added the following sentence: <b>The splicing diagram shall include all fibers from cabinet patch panel to the trunk line including all pull and splice vaults.</b>
	51	Section 7.6.1, Manufacturer Testing and Certification of Fiber Cable, revised the second paragraph as follows: The Design-Build Firm shall provide the manufacturer's on-reel test results for Engineer's approval before <b>installing</b> the fiber optic cable. These on-reel tests shall include, but not be limited to, end-to-end loss <b>for every fiber strand of the 96 single mode fiber</b> . The manufacturer's on-reel OTDR test results shall clearly show each one of the 12 single mode fiber strands is tested in each one of the 8 buffer tubes.
	53	Section 8.1 Description, revised the third paragraph in its entirety as follows: <b>All field cabinet devices shall have grounding and surge suppression compliant with the FDOT Supplemental Specification Section 785-2. The Design-Build Firm shall utilize full size field cabinets, type 336 or larger, at all device sites. The Department will not allow the use of equipment enclosures in lieu of a full size cabinet.</b>
	53	Section 8.2, Requirements, third paragraph, added <b>volts alternating current (VAC)</b>
	55	Section 8.2 Requirements, revised the second and third paragraphs of this as follows: <b>Alternating current (AC)</b> isolation shall be provided within the cabinet. All cabinets shall be configured to accept 120 VAC from the utility. Cabinets shall be configured with the following minimum number of breakers and outlets: <ul style="list-style-type: none"> <li>• Two 15 amp branch circuit breakers in cabinets that are provided with 120 or 120/240 VAC power. One breaker <b>shall</b> feed the GFIC duplex outlet. The second breaker <b>shall</b> feed the other devices in the cabinet.</li> <li>• Outlets <b>shall</b> be provided for each piece of equipment plus 2 spare outlets.</li> </ul> <p>The circuit breakers shall be UL listed and have an interrupt capacity of 5,000 amperes and insulation resistance of 100 Mega ohms at 500 <b>volts direct current (VDC)</b>. The power distribution blocks shall be suitable for use as power feed and junction points for two- and three-wire circuits. The AC neutral and equipment ground wiring and terminal blocks shall be isolated from the line wiring by an insulation resistance of at least 10 Mega ohms when measured at the AC neutral.</p>

		Added the following paragraph after paragraph fourteen  <b>The Design-Build Firm shall provide all patch cables for connecting equipment furnished and installed according to these MTRs. These patch cables shall include all necessary data (Category 6 and single mode fiber optic cables) and video (Composite, S-Video, Component Video, HDMI) cables.</b>
	56	Section 8.3.3 Ethernet Hub Equipment Shelter, first bullet, added <b>climate</b> for the shelter.
	59	Section 9.1, Description, added <b>National Electric Code</b> and <b>Transient Voltage Surge Suppressor</b> to the first sentence.
	60	Section 10.1, Description, replaced will with <b>shall</b> in the last sentence of paragraph one.
	61	Section 10.6, Construction Requirements, second paragraph, first sentence, deleted on and replaced it with <b>within.</b>
	61	Section 10.6, Construction Requirements, in the fourth paragraph, between the second and third sentence, the following was added: . <b>When collocating the MVDS with a CCTV camera location, the MVDS shall be mounted so the CCTV camera does not conflict when lowering.</b>
	63	Section 11.2, Design Requirements, First bullet, added <b>Device</b> Second bullet, first paragraph, revised it to read <b>Outside the clear recovery area</b> Third bullet, deleted Precise and replaced it with <b>Final.</b>
	63	Section 11.2 Design Requirements, added <b>weed barrier and gravel</b> to the third paragraph
	64	Section 11.5.4 Foundation and Tower, revised the header to <b>Foundation and Pole</b> and <b>deleted concrete</b> from the first sentence.
	65	Section 11.9 Warranty, deleted completion of the Burn-in period and replaced it with <b>Final Acceptance.</b>
	66	Section 12.1 requirements, added <b>Highway Advisory Radio</b> to the first sentence.
	66	Section 12.1 Requirements, deleted the second paragraph and replaced it with <b>The HAR system shall comply with the FDOT Supplemental Specification 781-4 and these MTRs.</b>
	66	Section 12.1, Requirements, fourth paragraph, third sentence, added <b>driven.</b>
	66	Section 12.1 Requirements, fifth paragraph, revised Conceptual layout drawings to <b>Conceptual Layout</b> in the whole paragraph.
	66	Section 12.1, Requirements, seventh paragraph was revised as follows: <b>Each of the HAR transmitters shall work as an independent HAR station announcing its own audio message. The HAR system control software module shall allow the user to dynamically adjust the AM radio transmitter power from 0 to 10 watts in the increments of 0.1 watts. When two adjacent HAR stations are working in independent HAR station mode, the HAR system control software shall be configurable by the user to adjust each HAR station AM radio transmitter power output so that there shall be a silent gap of about ½-mile between the two adjacent HAR transmitter stations.</b> Also,
	66	Section 12.1, Requirements, seventh paragraph, revised the last sentence as follows: When two adjacent HAR stations are working in independent HAR station mode, the HAR system control software shall be <b>configurable by the</b>

		user to <b>adjust each</b> HAR station AM radio transmitter power output so that there shall be a silent gap of about ½-mile between the two adjacent HAR transmitter stations.
	66	Section 12.1, Requirements, eight paragraph, revised the last sentence as follows: The Design-Build Firm shall install HAR manufacturer’s software on all SWIFT Center <b>operator workstations and all</b> Sarasota-Manatee STMC workstations to provide this output power adjustment capability.
	66	Section 12.1 Requirements, ninth paragraph, deleted <b>(1 to 11)</b>
	67	Section 12.3 Testing Requirements, revised the first paragraph and replaced it as follows: <b>The Design-Build Firm shall test the entire HAR system utilizing the Department’s SunGuide® Software system and the vendor software in both the independent operating mode of multiple HAR stations and their associated flashing beacons, and in synchronized mode of multiple HAR stations and their associated flashing beacons from both the SWIFT Center and the Sarasota-Manatee STMC. For testing purposes, it may be necessary for Department staff to ride along the corridor to verify both types of operation. The test results shall be clearly documented and provided to the Engineer. It should be noted that testing of the HAR transmitters is not allowed before the FCC licenses are received.</b>
	69	Section 13.2 Engine Generator Backup System, added the following, <b>The Department requires an engine generator backup system similar to the one in place within Collier and Lee Counties. The existing backup system powers all DMSs and all communication switches necessary to control and place messages on those DMSs. The object of the engine generator backup system is to provide messages on those DMSs within Sarasota and Manatee Counties when there is no electrical power from the service provider.</b>
	69	Added Section Header <b>13.2.1 Design Requirements</b> and revised the section as follows: <b>The Design-Build Firm shall design the system to allow for message posting and the necessary communications to the signs and between the SWIFT Center and the Sarasota-Manatee STMC. The Design-Build Firm shall provide and install diesel-electric generator units at all power service point locations that provide power for a DMS and those locations that provide power for the communications backhaul. The units shall be sized to carry the full electric load fed from that point, plus 20%, for 24 hours. Only one unit will be allowed at any location. The FDOT has standardized on 7.5 KVA, 120/240 VAC 1 phase, 15 KVA 120/240 VAC 1 phase, and 25 KVA 120/240 VAC 1 phase units and effort should be expended to utilize these sizes. Request for variance to these sizes requires approval of the Engineer.</b>  <b>The 25 KVA units shall be designed for permanent installation and the 7.5 KVA and 15 KVA units shall be designed to be temporarily installed.</b>  <b>Each power service point location shall be equipped with a concrete pad, designed to support the generator unit, a lockdown method to secure the unit, a permanently installed electrical transfer switch to transfer the load from commercial to generator unit power, and housing to protect the unit. The 7.5 KVA units shall include a permanently mounted cabinet to protect the unit from theft. The Design-Build Firm is responsible for designing a cabinet that meets the exhaust and air flow requirements of the generators provided so the units do not overheat. The cabinet design shall address the</b>

		<p>need for ease of installing and removing the 7.5 KVA generators. Each location shall be bonded and grounded as required by the NEC.</p> <p>Locations served by 7.5 KVA and 15 KVA units shall be equipped with manual transfer switches while locations served by the 25 KVA units shall be equipped with an automatic transfer switch. Transfer switches shall be fused to protect the downstream components.</p>
	70	<p>Added Section Header <b>13.2.2, Remote Monitoring Requirements</b> and revised the first sentence as follows: <b>The 25 KVA generator units and associated automatic transfer switches shall be provided with performance monitoring equipment permanently installed that report to and are controlled by the SWIFT Center and the Sarasota-Manatee STMC</b></p>
	70	<p>Section 13.2.2 Remote Monitoring Requirements, second paragraph, second sentence, deleted should and replaced it with <b>shall</b> after alarm.</p>
	70	<p>Added Section Header <b>13.2.3 Testing</b>  <b>The Design-Build Firm shall test the generator backup system as a complete system. The test shall last for a minimum of 6 hours and the Design-Build Firm shall monitor the generators to verify that they work as designed. The Design-Build Firm shall coordinate this test with the SWIFT Center Manager and the SWIFT Center IT Manager.</b></p>
	70	<p>Added Section Header <b>13.2.4 Deliverables</b>  <b>The Design-Build Firm shall provide copies of the unit operations and maintenance manuals for each unit supplied to the FDOT.</b></p>
	70	<p>Added Section Header <b>13.2.5 Training</b>  <b>The Design-Build Firm shall provide training on this equipment. This training shall consist of 2 hours of classroom theory on operations for both operation personnel and maintenance personnel and 6 hours of hands on training in the field for maintenance personnel for up to 10 representatives designated by the Engineer.</b></p>
	70	<p>Added Section Header <b>13.3 Remote Power Management</b>  <b>The Design-Build Firm shall provide remote power management (RPM) for controlling multiple network devices and services. The RPM shall individually control AC power for up to eight connected devices. Once connected to the network, the RPM shall provide access and control using a standard web browser and your password. The Design-Build Firm shall supply remote power management in each cabinet servicing a DMS within the Sarasota/Manatee FMS.</b></p> <p><b>The RPM shall provide the following minimum functionalities:</b></p> <ul style="list-style-type: none"> <li>• Eight outlets;</li> <li>• Network connections via Ethernet;</li> <li>• Network control/support via HTTP server &amp; SNMP agent TCP/IP;</li> <li>• Scheduled event control including day of week and specific time start-up and shutdown; and</li> <li>• Notifications including pagers and network broadcast messages.</li> </ul>
	71	<p>Added Section Header <b>13.3.1 Testing</b>  <b>The Design-Build Firm shall test the RPM with each connected device. The Design-Build Firm shall coordinate this test with the SWIFT Center Manager and the SWIFT Center IT Manager.</b></p>

	71	Renumbered 13.3 Warranty to <b>13.4 Warranty</b> and added the following after paragraph one, <b>The engine generator units shall carry a manufacturer's warranty of two years. The transfer switches and transformers shall carry a manufacturer's warranty of eighteen (18) months.</b>
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Attached is the revised Request for Proposal package (dated September 13, 2011), as well as, Attachment A, Minimum Technical Requirements (dated September 13, 2011) and Attachment B, Conceptual Plan Revision pg2 9.6.11.pdf .

Inclusive to this Addendum are the following files:

- Existing As built for hardware/software at the RTMC
- Preventive Maintenance Checklists

Acknowledge receipt of Addendum Number Four in the space provided on the proposal.

Felipe Alvarez

*Felipe Alvarez*

Design Build Administrator

**PLEASE SIGN BELOW IN RECEIPT OF THIS NOTICE AND ADDITIONAL DOCUMENTS ANNOTATED ABOVE.**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Company Name



*Florida Department of Transportation*  
*District One*

**DESIGN/BUILD  
REQUEST FOR PROPOSAL**

**For**

**I-75 Freeway Management System  
Sarasota and Manatee Counties  
and Satellite Traffic Management Center**

**Financial Projects Number(s):  
414730-1-52-01, 414732-1-52-01 & 414736-1-52-01  
Federal Aid Project Number(s): 0756-116  
Contract Number: E1J73**

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**ATTACHMENTS**

**ATTACHMENT “A” – ITS Minimum Technical Requirements (MTRs)**

**ATTACHMENT “B” – Conceptual Device Layout**

**ATTACHMENT “C” – SunGuide® Implementation Plan for FDOT Sarasota/Manatee County  
Satellite TMC Integration Project**

**ATTACHMENT “D” – Division I Design/Build Specifications**

**ATTACHMENT “E” - Form FHWA 1273**

The attachments listed in the table of contents are by this reference hereby incorporated into and made a part of this RFP as though fully set forth herein.

## **I. Introduction.**

The Florida Department of Transportation (Department) has issued this Request for Proposal (RFP) to solicit competitive bids and proposals from Proposers to design, procure, install, integrate, and test an Intelligent Transportation System (ITS) and subsystems along the I-75 corridor in Sarasota and Manatee counties.

### **Description of Work**

The FPN Numbers description of work and limits are as follows:

- FPID 414730-1-52-01, I-75 in Sarasota County from Charlotte County Line to Manatee County Line, design and construct a Freeway Management System
- FPID 414732-1-52-01, I-75 in Manatee County from Sarasota County Line to I-275, Manatee County, design and construct a Freeway Management System
- FPID 414736-1-52-01, Integrate the Freeway Management System installed under FPID 414730-1-52-01 and 414732-1-52-01 with the RTMC in Lee County and the Sarasota/Manatee County Satellite Transportation Management Center (STMC) in Manatee County

The Department seeks a Design/Build Firm to design, install, and integrate Freeway Management System (FMS) field elements, including closed-circuit television (CCTV) cameras, dynamic message signs (DMS), road weather information systems (RWIS), highway advisory radio (HAR), non-intrusive microwave vehicle detectors, an emergency generator back-up system and fiber optics communications cable and transmission equipment along approximately 56 miles of I-75 starting just north of the Charlotte/Sarasota County Line near Mile Marker 172 and ending at the I-275 interchange in Manatee County near Mile Marker 228. Also included with this project is the integration of the FMS field elements into the Sarasota/Manatee County Satellite Transportation Management Center (STMC) in Manatee County and into the Southwest Interagency Facility for Transportation (SWIFT) SunGuide® Regional Transportation Management Center (RTMC) in Lee County. Upgrades include incorporating additional video feeds into the video wall currently in operation at the SWIFT Center and installation of a new video wall at the STMC facility.

The FMS shall operate out of the STMC as a remote workstation of the SWIFT Center with a redundant backup system that mirrors the SWIFT Center network room setup.

The project work includes the furnishing, installing, integration and testing of elements listed below:

- ITS field elements – CCTV cameras, non-intrusive microwave vehicle detectors, DMS, RWIS, HAR transmitters, and HAR beacons.
- A 96-strand single-mode fiber optic backbone cable extending the full length of the project, including communications equipment for interfacing the ITS field elements with the existing RTMC and the STMC.
- Emergency generator back-up system consisting of generators, transfer switches, transformers, cabinets, security locks, real-time monitory system and all other ancillary equipment.

Failure to provide the equipment described above or to meet the minimum requirements outlined in this RFP and accompanying attachments shall provide cause to disqualify a Proposer. The minimum functional and technical requirements for the design, procurement, installation, integration and testing of the various project elements are included in Section VI, Design and Construction Criteria, and Attachment A, ITS Minimum Technical Requirements (MTRs) document.

The ITS field devices such as the CCTV cameras, DMS, HAR, detectors, and RWIS sensors to be procured must be on the Approved Products List (APL) prior to installation in the field, and the protocol used by the devices to be controlled by the SunGuide<sup>®</sup> software is to be compliant with the protocols listed in the Devices Supported by SunGuide<sup>®</sup> Software document, which is available online at <http://sunguide.datasys.swri.edu/>. The Design/Build Firm may propose alternate ITS equipment; however, the Design/Build Firm shall be responsible for shepherding those devices not on the APL through the process so the devices are on the APL at the time of installation.

The Design/Build Firm shall be responsible for all costs incurred in developing any new device drivers with the protocols listed in the Devices Supported by SunGuide<sup>®</sup> Software document, which is available online at <http://sunguide.datasys.swri.edu/>. The development of any new device drivers shall be at no additional cost to the Department, and the source code and all documentation for the developed drivers shall become the property of the Department.

The Design/Build Firm shall integrate the individual ITS subsystems (CCTV cameras, DMS, HAR, detectors, and RWIS sensors) with the individual vendor-provided control software such that each of the subsystems shall operate as a stand-alone system. After the completion and acceptance of the individual ITS subsystems, the Design/Build Firm shall integrate the ITS subsystems with the SunGuide<sup>®</sup> central software. The Design/Build Firm shall integrate the emergency generator back-up system as a subsystem at the SWIFT Center and the Sarasota/Manatee STMC for remotely monitoring the operations of permanent mount generators.

The Design/Build Firm is responsible to identify, provide, and install all of the equipment that is required to for a complete integrated system as defined in this RFP and its attachments. All system auxiliaries and peripheral equipment including, but not limited to, video encoders/decoders, fiber optics transceivers, repeaters, terminal servers, media converters, connectors, cables, testing equipment and software, etc., are considered as part of and are to be included under the individual subsystems.

Attachment B – Conceptual Device Layout provides information about placement of the proposed DMS, HAR transmitters, HAR beacon signs and RWIS. Attachment B shows possible locations for these new devices with respect to existing interstate signage and other interstate features at the time of field review. The Design/Build Firm is responsible for reviewing the existing conditions for final placement of the proposed devices.

**A. Design/Build Responsibility**

The Design/Build Firm shall be responsible for survey, geotechnical investigation, design, acquisition of all permits not acquired by the Department, any required modification of permits acquired by the Department, maintenance of traffic, demolition, and construction on or before the project completion date indicated in the Technical Proposal. The Design/Build Firm will coordinate all utility relocations.

The Design/Build Firm shall install the conduit trunkline eight (8) feet from the right-of-way fence except in areas where utilizing a bridge mount conduit. The Design/Build Firm is responsible for clearing and grubbing the project as necessary for the installation of the trunkline conduit.

The Design and Construction Criteria (Section VI) sets forth requirements regarding survey, design, construction, maintenance of traffic during construction, requirements relative to project management, scheduling, and coordination with other agencies and entities such as state and local government, utilities, environmental permitting agencies, and the public.

The Design/Build Firm shall demonstrate good project management practices while working on this project. These include prompt communication with the Department and others as necessary, management of time and resources, and complete documentation.

The Design/Build Firm shall utilize the U.S. Department of Homeland Security's E-Verify system, in accordance with the terms governing use of the system, to confirm the employment eligibility of all persons employed by the Design/Build Firm during the term of the Contract to perform employment duties within Florida and all persons, including subcontractors, assigned by the Design/Build Firm to perform work pursuant to the contract with the Department.

### **B. Department Responsibility**

The Department will provide contract administration, management services, construction engineering inspection (CEI) services and quality acceptance reviews of all work associated with the development and preparation of the contract plans and construction of the improvements. The Department will provide job specific information and/or functions as outlined in this document.

## **II. Schedule of Events.**

Below is the current schedule of the remaining events that will take place in the selection process. The Department reserves the right to make changes or alterations to the schedule as the Department determines is in the best interests of the public. The Department shall notify proposers sufficiently in advance of any changes or alterations in the schedule. Unless otherwise notified in writing by the Department, the dates indicated below for submission of items or for other actions on the part of a Proposer shall constitute absolute deadlines for those activities and failure to fully comply by the time stated shall cause a Proposer to be disqualified.

<b>Date</b>	<b>Event</b>
<u>July 18, 2011</u>	Pre-Proposal Meeting at 9:30 a.m., local time, in the Mike Rippe Auditorium, District One Headquarters, 801 North Broadway Avenue, Bartow, FL 33830.
<u>August 10, 2011</u>	Site visits for the Sarasota/Manatee County Satellite Management Center (STMC) and the Southwest Interagency Facility for Transportation (SWIFT) at 9:30 am and 1:30 pm respectively. Limit of three attendees for each Design Build Firm.
<u>September 19, 2011</u>	Final deadline for submission of questions/information
<u>September 27, 2011</u>	Technical Proposals due in District Office by 4:00 p.m. local time
<u>November 15 2011</u>	Question and Answer Session. Times will be assigned during the pre-proposal meeting. One hour will be allotted for questions and responses.

<u>November 30, 2011</u>	Price Proposals due in District Office by 2:30 p.m., local time.
<u>November 30, 2011</u>	Public announcing of Technical Scores and opening of Price Proposals at 2:30 p.m., local time, in District One Headquarters, 801 North Broadway Avenue, Bartow, FL 33830.
<u>December 13, 2011</u>	Public Meeting of Selection Committee to determine intended Award at 11:00 a.m., local time.
<u>December 13, 2011</u>	Posting of the Department's intended decision to Award (will remain posted for 72 hours)
<u>December 21, 2011</u>	Anticipated Award Date
<u>January 31, 2012</u>	Anticipated Execution Date

### III. Threshold Requirements.

#### A. Qualifications

Proposers are required to be pre-qualified in all work types required for the project. The technical qualification requirements of Florida Administrative Code (F.A.C.) Chapter 14-75 and all qualification requirements of F.A.C. Chapter 14-22, based on the applicable category of the project, must be satisfied.

#### B. Joint Venture Firm

Two or more firms submitting as a Joint Venture must meet the Joint Venture requirements of Section 14-22.007, Florida Administrative Code. Parties to a joint venture must submit a Declaration of Joint Venture and Power of Attorney Form No. 375-020-18, prior to the deadline for receipt of Letters of Interest.

If the Proposer is a joint venture, the individual empowered by a properly executed Declaration of Joint Venture and Power of Attorney Form shall execute the proposal. The proposal shall clearly identify who will be responsible for the engineering, quality control, and geotechnical and construction portions of the Work.

#### C. Price Proposal Guarantee

A bid guaranty in an amount of not less than five percent of the total bid amount shall accompany each Proposer's Price Proposal. The guaranty may, at the discretion of the Proposer, be in the form of a cashier's check, bank money order, bank draft of any national or state bank, certified check, or surety bond, payable to the Department. The surety on any bid bond shall be a company recognized to execute bid bonds for contracts of the State of Florida. The guaranty shall stand for the Proposer's obligation to timely and properly execute the contract and supply all other submittals due therewith. The amount of the guaranty shall be a liquidated sum, which shall be due in full in the event of default, regardless of the actual damages suffered. The bid guaranty of all Proposers shall be released at such time as the successful Proposer has complied with the condition stated herein, but not prior to that time.

#### D. Pre-Proposal Meeting

Attendance at the pre-proposal meeting is mandatory and any shortlisted Proposer who fails to attend will be deemed non-responsive and automatically disqualified from further consideration. The purpose of this meeting is to provide a forum for all concerned parties to discuss the proposed project; answer questions

on the design and construction criteria, CPM schedule, and method of compensation; provide instructions for submitting proposals; and address other relevant issues. In the event that any discussions or questions at the pre-proposal meeting require, in the Department's opinion, official additions, deletions, or clarifications of the Request for Proposal, the Design and Construction Criteria, or any other document, the Department will issue a written summary of questions and answers or an addendum to this Request for Proposal as the Department determines is appropriate. No oral representations or discussions which take place at the pre-proposal meeting will be binding on the Department. The Federal Highway Administration (FHWA) will be invited on oversight projects in order to discuss the project in detail and to clarify any concerns. Proposers shall direct all questions to the Department's Question and Answer website: <http://www2.dot.state.fl.us/construction/bidquestionmain.asp>.

During and after the meeting, it is the responsibility of the Project Manager/Contracting Unit to ensure that each Proposer develops their technical proposal with the same information. If a Proposer receives information from the Department relating to the project prior to the information cutoff date, the Department will ensure that all Proposers receive the same information in a timely fashion. The project file will clearly document all communications with any Firm regarding the design and construction criteria by the Contracting Unit or the Project Manager.

#### **E. Question and Answer Session**

The Department may meet with each Proposer, formally, for a Question and Answer session. FHWA shall be invited on FA Oversight Projects. The purpose of the Q & A session is for the Technical Review Committee to seek clarification and ask questions, as it relates to the Technical Proposal, of the Proposer. The **Question and Answer sessions** will occur a minimum of two (2) weeks after the date the Technical Proposal are due, and be part of the Overall Technical Proposal Scoring. The Proposers shall be given a minimum of one (1) week after the **Question and Answer** session to submit their Price Proposal. The Department **will** terminate the **presentations** promptly at the end of the allotted time. The Department may tape record or videotape all or part of the **presentations**. The **Question and Answer** session will not constitute "discussions" or negotiations. Proposers will not be permitted to ask questions of the Department except to ask the meaning of a clarification question posed by the Department. Within one (1) week of the **Question and Answer** session, the Design/Build Firm shall submit to the Department a written clarification letter summarizing the answers provided during the **Question and Answer** session. The Design/Build Firm shall not include information in the clarification letter which was not discussed during the **Question and Answer** session. In the event the Design/Build Firm includes additional information in the clarification letter which was not discussed during the **Question and Answer** session and is not otherwise included in the Technical Proposal, such additional information will not be considered by the Department during the evaluation of the Technical Proposal. No additional time will be allowed to research answers.

The Department will provide some (not necessarily all) proposed questions to each firm as it relates to their technical proposal approximately 24 hours before the scheduled Question and Answer Session. No supplemental materials, handouts, etc. will be allowed to be presented in the Question and Answer Session.

#### **F. Protest Rights**

Any person who is adversely affected by the specifications contained in this Request for Proposal must file a notice of intent to protest in writing within 72 hours of the receipt of this Request for Proposal. The formal written protest shall be filed within 10 days after the date of the notice of protest, if filed. The person filing the Protest must send the notice of intent and the formal written protest to:

Clerk of Agency Proceedings  
Department of Transportation  
605 Suwannee Street, MS 58, Room 562  
Tallahassee, Florida 32399-0458

The formal written protest must state with particularity the facts and law upon which the protest is based be legible on 8 ½ x 11-inch white paper, and contain the following:

1. Name, address, telephone number, and Department identifying number on the Notice, if known, and name, address, and telephone number of a representative, if any; and
2. An explanation of how substantial interest will be affected by the action described in the Request for Proposal; and
3. A statement of when and how the Request for Proposal was received; and
4. A statement of all disputed issues of material fact. If there are none, this must be indicated; and
5. A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle to relief; and
6. A demand for relief; and
7. Conform to all other requirements set out in Florida Statutes (F.S.), Chapter 120 and Florida Administrative Code (F.A.C.), Chapter 28-106, including but not limited to Section 120.57 F.S. and Rules 28-106.301, F.A.C., as may be applicable.

A formal hearing will be held if there are disputed issues of material fact. If a formal hearing is held, this matter will be referred to the Division of Administrative Hearings, where witnesses and evidence may be presented and other witnesses may be cross-examined before an administrative law judge. If there are no disputed issues of material fact, an informal hearing will be held, in which case the person filing the protest will have the right to provide the Department with any written documentation or legal arguments which they wish the Department to consider.

Mediation pursuant to Section 120.573, F.S., may be available if agreed to by all parties, and on such terms as may be agreed upon by all parties. The right to administrative hearing is not affected when mediation does not result in a settlement.

Failure to file a protest within the time prescribed in Section 120.57(3), F.S., shall constitute a waiver of proceedings under Chapter 120, F.S.

#### **G. Non-Responsive Proposals**

Proposals found to be non-responsive shall not be considered. Proposals may be rejected if found to be in nonconformance with the requirements and instructions herein contained. A proposal may be found to be non-responsive by reasons, including, but not limited to, failure to utilize or complete prescribed forms, conditional proposals, incomplete proposals, indefinite or ambiguous proposals, failure to meet deadlines, and improper and/or undated signatures.

Other conditions which may cause rejection of proposals include evidence of collusion among Proposers, obvious lack of experience or expertise to perform the required work, submission of more than one proposal for the same work from an individual, firm, joint venture, or corporation under the same or a different name (also included for Design/Build projects are those proposals wherein the same Engineer is identified in more than one proposal), failure to perform or meet financial obligations on previous contracts, employment of unauthorized aliens in violation of Section 274A (e) of the Immigration and Nationalization Act, or in the event an individual, firm, partnership, or corporation is on the United States Comptroller General's List of Ineligible Design/Build Firms for Federally Financed or Assisted Projects.

Proposals will also be rejected if not delivered or received on or before the date and time specified as the due date for submission.

#### **H. Waiver of Irregularities**

The Department may waive minor informalities or irregularities in proposals received where such is merely a matter of form and not substance, and the correction or waiver of which is not prejudicial to other Proposers. Minor irregularities are defined as those that will not have an adverse effect on the Department's interest and will not affect the price of the Proposals by giving a Proposer an advantage or benefit not enjoyed by other Proposers. .

1. Any design submittals that are part of a proposal shall be deemed preliminary only.
2. Preliminary design submittals may vary from the requirements of the Design and Construction Criteria. The Department, at their discretion, may elect to consider those variations in awarding points to the proposal rather than rejecting the entire proposal.
3. In no event will any such elections by the Department be deemed to be a waiving of the Design and Construction Criteria.
4. The Proposer who is selected for the project will be required to fully comply with the Design and Construction Criteria for the price bid, regardless that the proposal may have been based on a variation from the Design and Construction Criteria.
5. Proposers shall identify separately all innovative aspects as such in the Technical Proposal. An innovative aspect does not include revisions to specifications or established Department policies. Innovation should be limited to Design/Build Firm's means and methods, roadway alignments, approach to project, use of new products, new uses for established products, etc.
6. The Proposer shall obtain any necessary permits or permit modifications not already provided.
7. Those changes to the Design Concept may be considered together with innovative construction techniques, as well as other areas, as the basis for grading the Technical Proposals in the area of innovative measures

### **I. Modification or Withdrawal of Proposal**

Proposers may modify or withdraw previously submitted proposals at any time prior to the proposal due date and time. Requests for modification or withdrawal of a submitted proposal shall be in writing and shall be signed in the same manner as the proposal. Upon receipt and acceptance of such a request, the entire proposal will be returned to the Proposer and not considered unless resubmitted by the due date and time. Proposers may also send a change in a sealed envelope to be opened at the same time as the proposal provided the change is submitted prior to the proposal due date.

### **J. Department's Responsibilities**

This Request for Proposal does not commit the Department to make studies or designs for the preparation of any proposal, nor to procure or contract for any articles or services. Proposers shall examine the Contract Documents and the site of the proposed work carefully before submitting a proposal for the work contemplated and shall investigate the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished and as to the requirements of all Contract Documents. Written notification of differing site conditions discovered during the design or construction phase of the project will be given to the Department's Project Manager.

The Department does not guarantee the details pertaining to borings, as shown on any documents supplied by the Department, to be more than a general indication of the materials likely to be found adjacent to holes bored at the site of the work, approximately at the locations indicated. Proposers shall examine boring data, where available, and make their own interpretation of the subsoil investigations and other preliminary data, and shall base their bid on their own opinion of the conditions likely to be encountered. The submission of a proposal is prima facie evidence that the Proposer has made an examination as described in this provision.

### **K. Design/Build Contract**

The Department will enter into a Lump Sum contract with the successful Design/Build Firm. In accordance with Section V, the Design/Build Firm will provide a schedule of values to the Department for their approval. The total of the Schedule of Values will be the lump sum contract amount.

The terms and conditions of this contract are fixed price and fixed time. The Design/Build Firm's submitted bid (time and cost) is to be a lump sum bid for completing the scope of work detailed in the Request for Proposal.

## **IV. Disadvantaged Business Enterprise (DBE) Program.**

### **A. DBE Availability Goal Percentage**

The Department of Transportation has an overall eight point one eight percent (8.18%) race-neutral DBE goal. This means that the State's goal is to spend at least 8.18% of the highway dollars with Certified DBE's as prime Design/Build Firms or as subcontractors. Race-neutral means that the Department believes that the 8.18% overall goal can be achieved through the normal competitive procurement process. The Department has reviewed this project and assigned a DBE availability goal shown on the bid blank/contract front page under "% DBE Availability Goal". Although not a contract requirement, the Department believes that this DBE percentage can realistically be achieved on this project based on the number of DBE's associated with the different types of work that will be required.

Under 49 Code of Federal Regulations Part 26, if the 8.18% goal is not achieved, the Department may be required to return to a race-conscious program where goals are imposed on individual contracts. The Department encourages all of our Design/Build Firms to actively pursue obtaining bids and quotes from Certified DBE's.

**B. Anticipated DBE Participation Statement**

The Department is reporting to the Federal Highway Administration the planned commitments to use DBE's. This information is being collected through the Anticipated DBE Participation Statement. This statement shall be submitted to the District Contract Compliance Manager/ Resident Compliance Officer who will then submit it electronically to the Equal Opportunity Office. Although these statements WILL NOT become a mandatory part of the contract, they will assist the Department in tracking and reporting planned or estimated DBE utilization.

**C. Equal Opportunity Reporting System**

The Design/Build Firm is required to report monthly, through the Department's Equal Opportunity Reporting System on the Internet at <http://www.dot.state.fl.us/equalopportunityoffice/> actual payments, minority status, and the work type of all subcontractors and suppliers. All DBE payments must be reported whether or not the prime initially planned to utilize the company. Each month, the prime must report actual payments to all DBE and MBE subcontractors and suppliers. In order for the race neutral DBE Program to be successful, cooperation is imperative.

**D. DBE Supportive Services Providers**

The Department has contracted with a consultant, referred to as DBE Supportive Services Provider, to provide managerial and technical assistance to DBEs. This consultant is also required to work with prime Design/Build Firms, who have been awarded contracts, to assist in identifying DBEs that are available to participate on the project. The successful Design/Build Firm should meet with the DBE Supportive Services Provider to discuss the DBEs that are available to work on this project. The current Provider for the State of Florida is serviced by Blackmon Roberts Group and can be reached at (863) 802-1280 in Lakeland or (305) 777-0231 in Coral Gables.

**E. DBE Affirmative Action Plan**

A DBE Affirmative Action Plan must be approved and on file with the Equal Opportunity Office prior to award of the contract for each prime Design/Build Firm. Update and resubmit the plan every three years. No Contract will be awarded until the Department approves the plan. The DBE Affirmative Action Plan must be on your company's letterhead, signed by a company official, dated, and contain all elements of an effective DBE Affirmative Action Plan. These Plans should be mailed to:

Florida Department of Transportation  
Equal Opportunity Office  
605 Suwannee Street, MS 65  
Tallahassee, FL 32399-0450

Questions concerning the DBE Affirmative Action Plan may be directed to the Equal Opportunity Office by calling (850) 414-4747.

## **F. Bidders Opportunity List**

The Federal DBE Program requires States to maintain a database of all firms that are participating, or attempting to participate, on DOT-assisted contracts. The list must include all firms that bid on prime contracts or bid or quote subcontracts on DOT-assisted projects, including both DBEs and Non-DBEs.

On the Bidders Opportunity Form, if the answers to numbers 2, 3, 4, or 5 are not known, leave them blank and the Department will complete the information. This information should be returned with the bid package or proposal package or submitted to the Equal Opportunity Office within three days of submission. It can be mailed to the Equal Opportunity Office or faxed to (850) 414-4879.

## **V. Project Requirements and Provisions for Work.**

### **A. Governing Regulations**

The services performed by the Design/Build Firm shall comply with all applicable Manuals and Guidelines including the Department, Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO), and additional requirements specified in this document. Except to the extent inconsistent with the specific provisions in this document, the Design/Build Firm shall use the current edition, including updates, of the following Manuals and Guidelines in the performance of this work. Current edition is the edition in place and adopted by the Department at the date of advertisement of this contract with the exception of the Standard Specifications for Road and Bridge Construction (Divisions II & III), Special Provisions and Supplemental Specifications, Manual on Uniform Traffic Control Devices (MUTCD), Design Standards and Design Standards Modifications. The Design/Build Firm shall use the edition of the Standard Specifications for Road and Bridge Construction (Divisions II & III), Special Provisions and Supplemental Specifications, Design Standards and Design Standard Modifications in effect at the time the bid price proposals are due in the District Office. The Design/Build Firm shall use the 2009 edition of the MUTCD. The Design/Build Firm is responsible to acquire and utilize the necessary manuals and guidelines that apply to the work required to complete this project. The services will include preparation of all documents necessary to complete the project as described in Section I of this document.

1. Florida Department of Transportation Roadway Plans Preparation Manuals  
<http://www.dot.state.fl.us/rddesign/PPMManual/PPM.shtm>
2. Florida Department of Transportation Design Standards  
<http://www.dot.state.fl.us/rddesign/DesignStandards/Standards.shtm>
3. Florida Department of Transportation Standard Specifications for Road and Bridge Construction (Divisions II & III), Special Provisions and Supplemental Specifications  
<http://www.dot.state.fl.us/specificationsoffice/Default.shtm>
4. Florida Department of Transportation Surveying Procedure  
<http://www2.dot.state.fl.us/proceduraldocuments/procedures/bin/550030101.pdf>
5. Florida Department of Transportation EFB User Guide (Electronic Field Book)  
<http://www.dot.state.fl.us/surveyingandmapping/downloads.shtm>
6. Florida Department of Transportation Drainage Manual  
<http://www.dot.state.fl.us/rddesign/dr/Manualsandhandbooks.shtm>
7. Florida Department of Transportation Soils and Foundations Handbook  
<http://www.dot.state.fl.us/structures/Manuals/SFH.pdf>

8. Florida Department of Transportation Structures Manual  
<http://www.dot.state.fl.us/structures/manlib.shtm>
9. Florida Department of Transportation Computer Aided Design and Drafting (CADD) Production Criteria Handbook Roadway Standards  
<http://www.dot.state.fl.us/ecso/downloads/publications/CriteriaHandBook/>
10. Florida Department of Transportation Production Criteria Handbook CADD Structures Standards  
<http://www.dot.state.fl.us/ecso/downloads/publications/CriteriaHandBook/>
11. Florida Department of Transportation Structures Manual including Temporary Structures Design Bulletins  
<http://www.dot.state.fl.us/structures/Memos/currentbulletins.shtm>
12. Instructions for Structures Related Design Standards  
<http://www.dot.state.fl.us/structures/IDS/IDSportal.pdf>
13. AASHTO – A Policy on Geometric Design of Highways and Streets  
[https://bookstore.transportation.org/item\\_details.aspx?ID=110](https://bookstore.transportation.org/item_details.aspx?ID=110)
14. MUTCD - 2009  
<http://mutcd.fhwa.dot.gov/>
15. Safe Mobility For Life Program Policy Statement  
<http://www2.dot.state.fl.us/proceduraldocuments/procedures/bin/000750001.pdf>
16. Traffic Engineering and Operations Safe Mobility for Life Program  
<http://www.dot.state.fl.us/trafficoperations/Operations/SafetyisGolden.shtm>
17. American with Disabilities Act  
<http://www2.dot.state.fl.us/proceduraldocuments/procedures/bin/625020015.pdf>
18. Florida Highway Landscape Guide  
<http://www.dot.state.fl.us/emo/beauty/landscap.pdf>
19. Florida Department of Transportation Florida Sampling and Testing Methods  
<http://www.dot.state.fl.us/statematerialsoffice/administration/resources/library/publications/fstm/disclaimer.shtm>
20. Florida Department of Transportation Pavement Coring and Evaluation Procedure  
<http://www.dot.state.fl.us/statematerialsoffice/administration/resources/library/publications/materialsmanual/documents/v1-section32-clean.pdf>
21. Florida Department of Transportation District Design Guidelines  
<http://www.dot.state.fl.us/rddesign/updates/files/updates.shtm>
22. Florida Department of Transportation District Design Memos or Practices Manual (as applicable)  
<http://www2.dot.state.fl.us/fdotd1erc/SFiles.aspx>
23. Florida Department of Transportation Utility Accommodation Manual  
<http://www.dot.state.fl.us/rddesign/utilities/UAM.shtm>
24. AASHTO – Specifications for Highway Bridges  
[https://bookstore.transportation.org/category\\_item.aspx?id=BR](https://bookstore.transportation.org/category_item.aspx?id=BR)
25. Florida Department of Transportation Construction Project Administration Manual  
<http://www.dot.state.fl.us/construction/Manuals/cpam/CPAMManual.shtm>

26. Florida Department of Transportation Flexible Pavement Design Manual  
<http://www.dot.state.fl.us/pavementmanagement/PUBLICATIONS.shtm>
27. Florida Department of Transportation Rigid Pavement Design Manual  
<http://www.dot.state.fl.us/pavementmanagement/PUBLICATIONS.shtm>
28. Florida Department of Transportation Pavement Type Section Manual  
<http://www.dot.state.fl.us/pavementmanagement/PUBLICATIONS.shtm>
29. Florida Department of Transportation Right of Way Manual  
<http://www.dot.state.fl.us/rightofway/Documents.shtm>
30. Florida Department of Transportation Intelligent Transportation System Guide Book  
[http://www.dot.state.fl.us/TrafficOperations/Doc\\_Library/Doc\\_Library.shtm](http://www.dot.state.fl.us/TrafficOperations/Doc_Library/Doc_Library.shtm)
31. Federal Highway Administration Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications  
<http://www.fhwa.dot.gov/engineering/geotech/pubs/reviewguide/checklist.cfm>
32. Florida Department of Transportation Bicycle and Pedestrian Policies and Standards  
[http://www.dot.state.fl.us/safety/ped\\_bike/ped\\_bike\\_standards.shtm](http://www.dot.state.fl.us/safety/ped_bike/ped_bike_standards.shtm)
33. Federal Highway Administration Hydraulic Engineering Circular Number 18 (HEC 18).  
[http://www.fhwa.dot.gov/engineering/hydraulics/library\\_arc.cfm?pub\\_number=17](http://www.fhwa.dot.gov/engineering/hydraulics/library_arc.cfm?pub_number=17)
34. Florida Department of Transportation Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways  
<http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.shtm>
35. Florida Statutes  
<http://www.leg.state.fl.us/Statutes/index.cfm?Mode=View%20Statutes&Submenu=1&Tab=statutes&CFID=14677574&CFTOKEN=80981948>
36. Software Requirements Specification (<http://sunguide.datasys.swri.edu>)
37. Software User Manual (<http://sunguide.datasys.swri.edu>)
38. Concept of Operation (<http://sunguide.datasys.swri.edu>)
39. Computer Sizing Estimate (<http://sunguide.datasys.swri.edu>)
40. Software Design Document (<http://sunguide.datasys.swri.edu>)
41. Version Description Document (<http://sunguide.datasys.swri.edu>)
42. Software Integration Plan (<http://sunguide.datasys.swri.edu>)
43. Software Acceptance Test Plan (<http://sunguide.datasys.swri.edu>)
44. Software Integration Case Procedures (<http://sunguide.datasys.swri.edu>)
45. Software Test Plan (<http://sunguide.datasys.swri.edu>)

## **B. Innovative Aspects**

Identify all innovative aspects separately as such in the Technical Proposal.

An innovative aspect does not include revisions to specifications, standards or established Department policies. Innovation should be limited to Design/Build Firm's means and methods, roadway alignments, approach to project, etc.

## **C. Geotechnical Services**

### **1. General Conditions:**

The Design/Build Firm will be responsible for identifying and performing any geotechnical investigation, analysis, and design dictated by the project needs. All geotechnical work necessary shall be performed in accordance with the governing regulations.

The Design/Build Firm shall provide the Department signed and sealed design and construction reports. The reports shall be a record set of all geotechnical information, including relevant support data.

### **2. Pile Foundations (Not Applicable to this Project)**

### **3. Drilled Shaft Foundations for Bridges and Major Structures**

The Design/-Build Firm is responsible for identifying and performing all geotechnical investigation, analysis, and design required for the project in accordance with FDOT guidelines, procedures, and specifications. The Design/-Build Firm shall employ geotechnical and drilled shaft testing consultants with the following minimum qualifications:

- Use professional engineers registered in the State of Florida with at least 3 years of post-registration experience in drilled shaft foundation design and construction. The Geotechnical Foundation Design Engineer of Record must have designed and worked on at least three (3) FDOT bridge projects, including at least one (1) FDOT Structures Design Category 2 bridge project with drilled shaft foundations. This "responsible charge" experience shall include verifiable and successful implementation of static, Osterberg Cell and/or Statnamic load test results, and evaluation of pilot hole data. All designs must be signed and sealed by the Geotechnical Foundation Design Engineer of Record.
- The drilled shaft installation shall be supervised and certified by the Geotechnical Foundation Design Engineer of Record. These services shall include providing CTQP-qualified Drilled Shaft Inspectors in the numbers necessary to comply with Department specifications for recording drilled shaft construction records. Provide drilled shaft construction logs to FDOT within 24 hours of completing the shaft.
- Use drilled shaft superintendents in responsible charge of drilling operations experienced in drilled shaft installation and testing in the State of Florida. This "responsible charge" experience shall include at least three (3) FDOT bridge projects, including at least one (1) FDOT Structures Design Category 2 bridge project with drilled shaft foundations.

The Design/-Build Firm shall submit qualification statements for the geotechnical and non-destructive testing firms to be used on the project for approval by the District Geotechnical Engineer at least 30 calendar days before beginning the design. Acceptance of the Design/-Build Firm's personnel does not relieve the Design/-Build Firm of the responsibility for obtaining the required results in the completed work.

#### **4. Drilled Shaft Foundations for Miscellaneous Structures**

The Design-Build Firm is responsible for identifying and performing all geotechnical investigation, analysis, and design required for the project in accordance with FDOT guidelines, procedures, and specifications. The Design-Build Firm shall employ geotechnical and drilled shaft testing consultants with the following minimum qualifications:

- Use professional engineers registered in the State of Florida with at least 3 years of post-registration experience in drilled shaft foundation design and construction.
- The drilled shaft installation shall be supervised and certified by the Geotechnical Foundation Design Engineer of Record. These services shall include providing CTQP-qualified Drilled Shaft Inspectors in the numbers necessary to comply with Department specifications for recording drilled shaft construction records. Provide drilled shaft construction logs to FDOT within 24 hours of completing the shaft.
- Use drilled shaft superintendents in responsible charge of drilling operations experienced in drilled shaft installation and testing in the State of Florida. This "responsible charge" experience shall include at least three (3) FDOT projects with drilled shaft foundations of similar size.

#### **D. Environmental Permits**

##### **1. Storm Water and Surface Water:**

Plans shall be prepared in accordance with Chapter 62-25, Regulation of Storm water Discharge, Florida Administrative Code.

##### **2. Permits:**

All applicable data shall be prepared in accordance with Chapter 373 and 403, Florida Statutes, Chapters 40 and 62, Florida Administrative Code; Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and parts 114 and 115, Title 33, Code of Federal Regulations. In addition to these Federal and State permitting requirements, any dredge and fill permitting required by local agencies shall be prepared in accordance with their specific regulations. Acquisition of all applicable permits will be the responsibility of the Design/Build Firm. Preparation of complete permit packages will be the responsibility of the Design/Build Firm. The Design/Build Firm will obtain permits while acting as an authorized representative for the "Department" for permitting purposes only. If any agency rejects or denies the permit application, it is the Design/Build Firm's responsibility to make whatever changes necessary to ensure the permit is approved.

The project is within the Southwest Florida Water Management District (SWFMD). The project may require an Environmental Resource Permit (ERP), U.S. Army Corps of Engineers (USACE) Nationwide Permits, a Florida Fish and Wildlife Conservation Commission (FWC) – Gopher Tortoise Relocation

Permit, a U.S. Coast Guard Permit, and a U.S. Environmental Protection Agency (EPA) – National Pollutant Discharge Elimination System (NPDES) Permit.

The Design/Build Firm will be required to pay all permit fees. Any fines levied by permitting agencies shall be the responsibility of the Design/Build Firm.

The Design/Build Firm shall be responsible for an assessment of all potential gopher tortoise habitats that could be impacted by the project. The habitat will be systematically surveyed according to the current guidelines published by the Florida Fish and Wildlife Conservation Commission (FWC). If gopher tortoise burrows are found, all practicable measures will be employed to avoid impacts. The Design/Build Firm shall be responsible for obtaining an FWC permit for the relocation of gopher tortoises and commensals from burrows which cannot be avoided, and relocation shall be performed at a time as close as practicable to the start of construction activities at the site of the burrows. If new burrows are found after relocation, their occupants will also be relocated. A copy of the permit and any subsequent reports to FWC must be provided to the District Environmental Management Office.

The Design/Build Firm will be required to pay all permit fees including any and all fees associated with the relocation of gopher tortoises. Any fines levied by permitting agencies shall be the responsibility of the Design/Build Firm.

However, notwithstanding anything above to the contrary, upon the Design/Build Firm's preliminary request for extension of Contract Time, pursuant to 8-7.3, being made directly to the District Construction Engineer, the Department reserves unto the District Construction Engineer, in his sole and absolute discretion, according to the parameters set forth below, the authority to make a determination to grant a non-compensable time extension for any impacts beyond the reasonable control of the Design/Build Firm in securing permits. Furthermore, as to any such impact, no modification provision will be considered by the District Construction Engineer unless the Design/Build Firm clearly establishes that it has continuously from the beginning of the project aggressively, efficiently and effectively pursued the securing of the permits including the utilization of any and all reasonably available means and methods to overcome all impacts. There shall be no right of any kind on behalf of the Design/Build Firm to challenge or otherwise seek review or appeal in any forum of any determination made by the District Construction Engineer under this provision.

#### **E. ITS Plans**

All plans are to be prepared in accordance with the latest design standards and practices, Department's Standard Specifications, Indices, Department's Plans Preparation Manual, and shall be accurate, legible, complete in design, drawn to the scale indicated in the Department's manuals and furnished in reproducible form.

#### **F. Signing and Marking Plans**

All plans are to be prepared in accordance with the latest design standards and practices (Manual on Uniform Traffic Control Devices), Department's Standard Specifications, Indexes, Department's Plans Preparation Manual, and shall be accurate, legible, complete in design, drawn to the scale indicated in the Department's manuals and furnished in reproducible form.

#### **G. Structures Plans**

All structures plans shall be prepared in accordance with the latest Department's Structures Manual, and interims and other Department's standards, policies, procedures, applicable temporary design bulletins

and directions from the State and District Structures Design Engineer. This shall be accurate, legible, complete in design, drawn to appropriate scale and furnished in reproducible form on material acceptable to the Department. All category level II bridge plans shall be peer reviewed by a pre-qualified independent firm not involved with the design team, prior to submittal to the Department.

#### **H. Railroad Coordination**

The Department has determined that a Railroad Agreement will not be required with CSX Railroad since the recommendation is to attach to the existing CSX overpass. If the Design/Build Firm does not want to attach to the overpass and pursues another method for installing the conduit, then an Agreement will be required with CSX Railroad for crossing their right of way. The Design/Build Firm will be responsible for all costs required to cross the CSX Railroad right of way.

#### **I. Survey**

The Design/Build Firm shall perform all surveying and mapping services necessary to complete the project. Survey services must also comply with all pertinent Florida Statutes and applicable rules in the Florida Administrative Code. All field survey data will be furnished to the District Surveyor in a Department approved digital format, readily available for input and use in CADD Design files. All surveying and mapping work must be accomplished in accordance with the Department's Surveying Procedure, Topic Nos. 550-030-101; Right-of-Way Mapping Procedure, Topic No. 550-030-015; Aerial Surveying Standards for Transportation Projects Procedure, Topic No. 550-020-002. This work must comply with the Minimum Technical Standards for Professional Surveyors and Mappers, Chapter 5J-17, Florida Administrative Code (F.A.C.), pursuant to Section 472.027, Florida Statutes (F.S.) and any special instructions from the Department. This survey also must comply with the Department of Environmental Protection Rule, Chapter 18-5, F.A.C. pursuant to Chapter 177, F.S., and the Department of Environmental Protection.

#### **J. Verification of Existing Conditions**

The Design/Build Firm shall be responsible for verification of existing conditions, including research of all existing Department records and other information.

By execution of the contract, the Design/Build Firm specifically acknowledges and agrees that the Design/Build Firm is contracting and being compensated for performing adequate investigations of existing site conditions sufficient to support the design developed by the Design/Build Firm and that any information provided by the Department is merely to assist the Design/Build Firm in completing adequate site investigations. Notwithstanding any other provision in the contract documents to the contrary, no additional compensation will be paid in the event of any inaccuracies in the preliminary information.

#### **K. Submittals**

##### **1. Plans**

Plans must meet the minimum contents of a particular phase submittal prior to submission for review. Clearly indicate the particular phase of each submittal on the cover sheet. Accompany all component submittals with sufficient information for adjoining components or areas of work to allow for proper evaluation of the component under review.

The Design/Build Firm shall provide copies of required review documents as listed below.

**60% Component Plans**

15 sets of 11" X 17" ITS Plans  
1 set of 11" X 17" ITS Plans in PDF format  
CCTV Camera Video Survey

**90% Component Plans**

15 sets of 11" X 17" ITS Plans  
1 set of 11" X 17" ITS Plans in PDF format  
6 copies of Draft Final Geotechnical Report  
6 sets of documentation - structures  
6 sets of power drop calculations  
6 sets of product cut sheets  
5 copies of Technical Special Provisions  
Independent Peer reviewer's comments and comment responses  
Cut sheets for Electronic and Networking Equipment

**Final Component Plans**

15 sets of 11" X 17" ITS Plans  
1 set of 11" X 17" ITS Plans in PDF format  
6 sets of final documentation  
6 copies of Final Geotechnical Report  
1 signed and sealed copy of Specifications Package  
2 sets of electronic copies of Technical Special Provisions on CD  
Independent Peer Reviewer's signed and sealed cover letter that all comments have been addressed and resolved.

**Construction Set**

1 set of 11"X 17" copies of the signed and sealed plans for the Department to stamp "Released for construction"  
2 sets of electronic plans each in Microstation and PDF format (converted from Microstation)

Deliver the final signed and sealed plans to the Department's Project Manager a minimum of 5 working days prior to construction of that component. The Department's Project Manager will send a copy of a final signed and sealed plans to the appropriate office for review and stamping "Released for Construction". Only stamped signed and sealed plans are valid and all work that the Design/Build Firm performs in advance of the Department's release of Plans will be at the Design/Build Firm's risk.

**Record Set**

The Design/Build Firm shall furnish to the Department, upon project completion, the following:

1 set of 11" X 17" signed and sealed plans  
1 set of 11" X 17" signed and sealed plans in PDF format  
15 sets of 11 "X 17" copies of the signed and sealed plans  
15 sets of final documentation (if different from final component submittal)

- 2 Final Project CDs
- 2 sets of electronic plans each in Microstation and PDF format (converted from Microstation)

The Design/Build Firm's Professional Engineer in responsible charge of the project's design shall professionally endorse (sign and seal and certify) the record prints, the Special Provisions and all reference and support documents. Perform the professional endorsement in accordance with the Department Plans Preparation Manual.

The Design/Build Firm shall complete the record set as the project is constructed. The record set becomes the part of the as-builts at the end of the project. All changes shall be signed/sealed by the Engineer of Record (EOR). The record set shall reflect all changes initiated by the Design/Build Firm or the Department in the form of revisions. The record set shall show Global Positioning System (GPS) coordinate (sub-foot accuracy) locations of all ITS field elements and equipment, including cabinets, equipment boxes, pull-boxes (electrical and fiber), splice vaults, access points, electrical cable routing, fiber optic cable routing, complete measurement of the fiber optic cable length including all slack cable, CCTV camera poles, DMS structures, vehicle detector poles, HAR transmitters and beacon signs, power drops and generator locations, etc. Provide a separate table listing the GPS coordinates for all ITS field elements installed by the Design/Build Firm as a part of the record set, in a format to be specified by the Department. The record set submitted by the Design/Build Firm shall include fiber optic cable test results and fiber optic cable splice diagrams identifying the individual fiber splices on the various fiber optic cables. The fiber optics splice diagram shall be developed and presented in a format specified by the Department. The record set shall also include all directional bore logs, the actual splice link loss budget information and the final power drop load calculations.

The Design/Build Firm shall submit the record set on a Final Project CD upon completion of field construction activities and prior to beginning the 30 day Systems Operational test. The CEI shall do a review of the record set prior to final acceptance in order to complete the record set.

The CEI shall certify the final plans as per Section 4.5.7 of Chapter 4 of the Preparation and Documentation Manual (TOPIC No. 700-050-010)

## **2. Milestones**

Component submittals, in addition to the plan submittals listed in the previous section will be required. In addition to various submittals mentioned throughout this document, the following submittals are required.

- 60% Design Submittal;
- 90% Design Submittal;
- Final Plans;
- Test Evaluation Matrix;
- Test Plan Submittal;
- Training Plan Submittal; and
- As-Built Plans/Record Set Drawings.

The Design/Build Firm shall be responsible for detailed plans checking as outlined in the Plans Preparation Manual (PPM) and as described herein. This includes a checklist of items listed in the PPM for each completed submittal. Plans must meet the minimum contents of a particular phase submittal prior to submission review. The design must be in conformity with the RFP, Attachments, approved preliminary layout and concept as provided in the technical proposal.

The Department must review and approve the signed and sealed design Final Plans before construction activities may begin. Component submittals shall be complete submittals along with all the supporting information necessary for review. The work must represent logical work activities and must show impact of future work on this project. Any modification to the construction due to subsequent design changes as the result of design development is solely the Design/Build Firm's risk. Upon review and approval, the Department's reviewer shall stamp the plans "Released for Construction" and initial and date.

The Design/Build Firm's schedule shall allow fifteen (15) working days for Department review time for each design submittal. The submittal of device specifications and equipment product sheets will not be accepted prior to the 90% plans submittal and shall allow fifteen (15) working days for review of each submittal. The review time will begin upon receipt of a complete submittal. No fabrication, casting or construction will occur until all related design, shop drawings, plans, and specifications comments are resolved to the Department's satisfaction.

If utilizing printed literature, such as cut-sheets, to satisfy some or all of the requirements, there shall be no statements within the literature which conflict with this RFP, the MTRs, the Design/Build Firm's written Technical Proposal or causes interpretation problems by the Department. The Design/Build Firm shall cross off, initial any such conflicting statements or data, and attach an appropriate statement clearly indicating how the RFP requirements are fulfilled. Submittals which are, in the judgment of the Department, insufficient to permit proper evaluation will be rejected.

### **3. Railroad Coordination**

The Department has determined that a Railroad Agreement will not be required with CSX Railroad since the recommendation is to attach to the existing CSX overpass. If the Design/Build Firm does not want to attach to the overpass and pursues another method for laying the conduit, then an Agreement will be required with CSX Railroad for crossing their right of way. The Design/Build Firm will be responsible for all costs required to cross the CSX Railroad right of way.

#### **L. Contract Duration**

The Design/Build Firm shall establish the contract duration for the subject project. In no event shall the contract duration exceed **760 calendar days**. The schedule supporting the proposed contract duration will be submitted with the Technical Proposal and should identify if the work activity durations are based on calendar days or working days. The Proposed Contract Time (PCT) reflected in the schedule may be amended in the bid proposal. The official PCT will be the one submitted with the Bid Price Proposal.

#### **M. Project Schedule:**

The Design/Build Firm shall submit a project schedule, in accordance with Subarticle 8-3.2 (Design/Build Division I Specifications), which supports the established contract duration submitted as part of the Proposal. The minimum number of activities shall be those listed in the payout schedule and those listed below:

- Anticipated Award Date
- Notice-To-Proceed (NTP)
- Design Submittals
- Design Approval for Construction
- Material Acquisition

- Begin Construction
- Design Survey
- Two (2) Design Workshops (one (1) for each of the 60% and 90% plan submittals)
- Design Reviews by the Department and FHWA
- Design Review / Acceptance Milestones
- Materials Quality Tracking
- Geotechnical Investigation
- Test Evaluation Matrix Submittal
- Test Evaluation Matrix Review
- Start of Construction
- Clearing and Grubbing
- Construction Mobilization
- Embankment/Excavation
- Environmental Permit Acquisition
- Foundation Design
- Foundation Construction
- Intelligent Transportation System Design
- Intelligent Transportation System Construction
- Maintenance of Traffic Design
- Maintenance of Traffic Set-Up (per duration)
- Erosion Control
- Test Plan Submittal
- Test Plan Review
- Training Plan Submittal
- Training Plan Review
- Subsystem Testing
- As-Built Plans/Record Drawings
- Coordination with SunGuide® Software Integrator
- Additional Construction Milestones as determined by the Design/Build Firm
- Final Completion Date for All Work

The Design/Build Firm's schedule should allow for a fifteen (15) working days review time for the Department's review of all submittals. The Department will review submittals through the Electronic Review Comment (ERC) system so that applicable Department personnel may comment on the various aspects of the plans. The Design/Build Firm shall designate one person to manage the responses to comments by Department personnel. The fifteen (15) working days review time shall be sufficient granted that the Design/Build Firm conducts design workshops with the Department and its designees prior to the plans phase submittals, and hence, the review time would then be used to make certain plans match comments directed during the workshops.

#### **N. Key Personnel/Staffing**

The Design/Build Firm's key personnel identified in the Technical Proposal shall perform and direct all work. Any changes in the indicated personnel shall be subject to review and approval by the Department's Project Manager. The Design/Build Firm shall have available a professional staff that meets the minimum training and experience set forth in F.S. Chapter 455 and applicable ITS Standards.

Those individuals who will be directly involved in the project should have demonstrated experience in the areas delineated in the scope of work. Individuals whose qualifications are presented will be committed to

the project for its duration unless otherwise exempted by the Department's Project Manager. Where State of Florida registration or certification is required or deemed appropriate, a copy of the registration or certificate shall be included in the Proposal package.

The Design/Build Firm shall be required to furnish proof that both the Design/Build Firm and the assigned Project Manager have at least three (3) years experience working with similar Design/Build contracts with specific experience in the following categories of work:

- a. Intelligent Transportation Systems design, procurement, installation and integration;
- b. Fiber optic (single-mode) communications outside plant design, installation, splicing and testing; and
- c. Ethernet communications networks.

The Design/Build Firm shall be required to furnish proof that the individual(s) selected as the system integrator has demonstrated acceptable experience with the Microsoft Clustering and the SunGuide software and shall be capable of providing all SunGuide integration services required for this project.

#### **O. Meetings and Progress Reporting**

The Design/Build Firm shall anticipate periodic meetings with Department personnel and other agencies as required for resolution of design and/or construction issues. The Design/Build Firm shall contact Ms. Cindy Clemmons, District Public Information Officer, at (863) 519-2362 for coordination with the District Public Information Office. These meetings may include, but are not limited to:

- Project Notice-to-Proceed (Kick-Off) meeting;
- Metropolitan Planning Organization (MPO) meetings;
- County Board Meetings;
- Pre-Construction meeting;
- Pre-Integration meeting;
- Department technical issue resolution;
- Permit agency coordination;
- Local government agency coordination; and
- Design Workshops (for the 60% and 90% plans submittals)
- Scoping Meetings.

During design, the Design/Build Firm shall meet with the Department's Construction Project Manager on a monthly basis and provide a month look ahead of the activities to be completed during the upcoming month.

During construction, the Design/Build Firm shall meet with the Department's Construction Project Manager on a weekly basis and provide a one-week look ahead for activities to be performed during the coming week.

The Design/Build Firm shall, on a monthly basis, provide written progress reports to the Construction Project Manager that describe the items of concern and the work performed on each task.

A minimum of five (5) primary project/design review meetings (Notice-to-Proceed/Kick-Off, 60% Design Workshop, 90% Design Workshop, Pre-Construction and Pre-Integration) shall be conducted:

**Notice-to-Proceed (Kick-Off) Meeting** - The purpose of the Kick-Off Meeting will be to review the contract specifications, to ascertain the adequacy of the Design/Build Firm's efforts in defining and understanding the requirements as contained and detailed in these Design and Construction Criteria, and to identify any areas which shall be clarified. In addition, the Project Schedule and QA/QC Plan shall be reviewed.

All action items resulting from this meeting shall be satisfactorily addressed before design and construction-planning activities can begin. All items reviewed at the meeting shall be coordinated with the Design and Construction Criteria to ensure contract compliance.

The meeting will be held at the Department's facilities on a mutually agreeable date within a specified number of calendar days after the Notice-to-Proceed date. All information, review documentation and materials required to conduct and support the meeting including the Project Schedule shall be submitted for review by the Department at least ten (10) calendar days prior to the scheduled meeting date.

The Kick-Off Meeting shall address, at a minimum, the following items:

- Review of coordination issues;
- Review of technical and contractual requirements;
- Review of the QA/QC Plan;
- Review of submittal process and control;
- Review of the action item / problem resolution process;
- Review of detailed Project Schedule; and
- Agree on next project meeting and tentative project meeting schedule.

**60% Design Workshop** – The purpose of the 60% Design Workshop is for the Department and the Design/Build Firm to meet and discuss the preliminary 60% plans submittal at a face-to-face meeting to provide feedback on the initial design. The Design/Build Firm shall submit preliminary 60% plans for review by the Department at least seven (7) days prior to the workshop. This review is intended to be cursory in nature to flush out any major issues and shall not be considered as an all-encompassing review. During the workshop, the Department and Design/Build Firm shall be involved in a page-by-page review of the plans and discussion of all design issues. Once the workshop is completed, the Design/Build Firm shall revise the design as discussed and submit the formal 60% plans for a 15 working day review by the Department.

**90% Design Workshop** – The purpose of the 90% Design Workshop is for the Department and the Design/Build Firm to meet and discuss the preliminary 90% plans submittal at a face-to-face meeting to provide feedback on the design. The Design/Build Firm shall submit preliminary 90% plans for review by the Department at least seven (7) days prior to the workshop. This review is intended to be cursory in nature to flush out any major issues and shall not be considered as an all-encompassing review. During the workshop, the Department and Design/Build Firm shall be involved in a page-by-page review of the plans and discussion of all design issues. Once the workshop is completed, the Design/Build Firm shall revise the design as discussed and submit the formal 90% plans for a 15 working day review by the Department.

**Pre-Construction Meeting** - The purpose of the Pre-Construction Meeting shall be to verify the Design/Build Firm's installation and deployment plans by reviewing factory and pre-installation test results, the Installation/Construction Plan, utility coordination issues, and other issues.

The Pre-Construction Meeting shall be scheduled at least thirty (30) calendar days before the beginning of construction / installation activities. The Design/Build Firm shall identify any concerns regarding deployment and provide detailed information on how such concerns will be addressed and minimized.

The CEI Senior Project Engineer will schedule the Pre-Construction Meeting. The Design/Build Firm shall provide all documentation as required to support the meeting to include detailed functional narrative text, system and subsystem drawings and schematics. Also included shall be the plans and engineering specifications to demonstrate all elements of the proposed design which includes, but is not limited to: technical, functional, and operational requirements; ITS/communications; equipment; termination/patch panels; performance criteria; and details relating to interfaces with other agencies and subsystems.

The Pre-Construction Meeting shall address, at a minimum, the following items:

- Review of the technical and operational details of the I-75 Freeway Management System including, but not limited to, the proposed equipment list, equipment configuration, cabinet layout, network interfaces, fiber splice plan, reconfiguration and fiber utilization plans;
- Review enclosure / cabinet design and configuration;
- Review any outstanding action items/system issues from previous project meetings;
- Identify and document all unresolved items with action responsibilities defined;
- Review all Test Results Submittals submitted and reviewed to date; provide status of test plans;
- Review of the Installation/Construction Plans;
- Review of detailed Integration Plans and schedule;
- Submittal of the Test Evaluation Matrix for review;
- Submittal of the Test Plans for review;
- Review plans for maintaining existing operations during the construction and integration activities of this project;
- Review of MOT and lane closure plans, if any; and
- Review any potential safety issues during installation.

All action items resulting from the Pre-Construction Meeting shall be satisfactorily addressed by the Design/Build Firm and reviewed and approved by the Department before granting final Pre-Construction Meeting approval. Construction shall not commence until all actions have been resolved.

All items reviewed at the Pre-Construction Meeting shall be coordinated with the RFP to ensure contract compliance with all items. Approval of the Pre-Construction Meeting does not release the Design/Build Firm's overall responsibility for ensuring that all design requirements, as specified, have been achieved in the final design and implementation.

**Pre-Integration Meeting** - The purpose of the Pre-Integration Meeting shall be to verify the Design/Build Firm's integration plans by reviewing proposed splicing diagrams, device placement plans, IP addressing schemes, proposed RTMC network upgrades, and other network design issues.

The Pre-Integration Meeting shall occur at least thirty (30) calendar days before the beginning of integration activities. The Design/Build Firm shall identify any concerns regarding the integration and provide detailed information on how to address and minimize such concerns.

The CEI Senior Project Engineer will schedule the Pre-Integration Meeting. The Design/Build Firm shall provide all documentation as required to support the meeting to include detailed functional narrative text,

system and subsystem drawings and schematics. Also included shall be the device installation worksheets to demonstrate all elements of the proposed design which includes, but is not limited to: technical, functional, and operational requirements; ITS/communications; equipment; termination/patch panels; performance criteria; and details relating to interfaces with other agencies and subsystems.

The Pre-Integration Meeting shall address, at a minimum, the following items:

- The site survey to prepare the creation of the system database, configuration files, system graphics, and other preparatory work for the integration of the SunGuide® software.
- Troubleshooting of any Design/Build Firm-installed hardware issues (both field and central) that affect the integration work.
- Preparing for the installation of the hardware and software required to operate the vendor provided and SunGuide® software.
- Provide ITS field device information, such as equipment configuration diagrams, IP addresses, protocols, and documentation (e.g., users' manual, troubleshooting guide, etc.).
- Provide the configuration of the ITS field devices for integration with the SunGuide® software, including link, lane, roadway, and device configurations.
- Provide post-installation services after testing the SunGuide® software. The services shall include populating the database and tables and creating map links.
- Procurement of all software licenses for servers and workstations.

All action items resulting from the Pre-Integration Meeting shall be satisfactorily addressed by the Design/Build Firm and reviewed and approved by the Department before granting final Pre-Integration Meeting approval. Integration shall not commence until all actions have been resolved.

All items reviewed at the Pre-Integration Meeting shall be coordinated with the RFP to ensure contract compliance with all items. Approval of the Pre-Integration Meeting does not release the Design/Build Firm's overall responsibility for ensuring that all design requirements, as specified, have been achieved in the final design and implementation.

## **P. Public Involvement**

### **1. General**

Public involvement is an important aspect of the project. Public involvement includes communicating to all interested persons, groups, and government organizations information regarding the development of the project. A Public Involvement Consultant (PIC) has been hired by the Department to carry out an exhaustive Public Involvement Campaign and a marketing effort. The Design/Build Firm shall contact Ms. Cindy Clemmons, District Public Information Officer, at (863) 519-2362 for coordination with the District Public Information Office. The Design/Build Firm will continue to be part of the Public Involvement effort but on a limited basis as described below.

### **2. Community Awareness**

The Design/Build Firm will review and comment on a Community Awareness Program provided by the PIC for the project.

### **3. Public Meetings**

The Design/Build Firm shall provide all support necessary for the PIC to hold various public meetings, which may include:

- Kick-off or introductory meeting
- Metropolitan Planning Organization (MPO) Citizens Advisory Committee Meetings
- MPO Transportation Technical Committee Meetings
- MPO Meetings
- Public Information Meetings
- Elected and appointed officials
- Special interest groups (private groups, homeowners associations, environmental groups, minority groups and individuals)

The Design/Build Firm shall include attendance at two meetings per month for the term of the contract to support the public involvement program.

For any of the above type meetings, the Design/Build Firm shall provide all technical assistance, data and information necessary for the PIC to produce display boards, printed material, video graphics, computerized graphics, etc., and information necessary for the day-to-day exchange of information with the public, all agencies and elected officials in order to keep them informed as to the progress and impacts that the proposed project will create. This includes workshops, information meetings, and public hearings.

The Design/Build Firm shall, on an as-needed basis, attend the meetings with an appropriate number of personnel to assist the Department's Project Representative/PIC. The Design/Build Firm shall forward all requests for group meetings to the Construction Project Manager (CPM) and the PIC. The Design/Build Firm shall inform the CPM and PIC of any meetings with individuals that occur without prior notice.

### **4. Public Workshops, Information Meetings**

The Design/Build Firm shall provide all the support services listed in No. 3 above. All legal/display ads announcing workshops, information meetings, and public meetings will be prepared and paid for by the PIC.

The Department will be responsible for the legal/display advertisements for design concept acceptance. The PIC will be responsible for preparing and mailing (includes postage) for all letters announcing workshops and information meetings.

### **5. Public Involvement Data**

The Design/Build Firm is responsible for the following:

- Coordinating with the Public Involvement Consultant.
- Identifying possible permit and review agencies and providing names and contact information for these agencies to the PIC.
- Providing required expertise (staff members) to assist the PIC on an as-needed basis.
- Preparing color graphic renderings and/or computer generated graphics to depict the proposed improvements for coordination with the Department, local governments, the Urban Design Guidelines Committee, and other agencies.

The collection of public input occurs throughout the life of the project and requires maintaining files, newspaper clippings, letters, and especially direct contacts before, during, and after any of the public meetings. Articles such as those mentioned shall be provided to the PIC for their use and records.

In addition to collecting public input data, the Design/Build Firm may be asked by the PIC to prepare responses to any public inquiries as a result of the public involvement process. The Department shall review all responses prior to mailing.

## **Q. Quality Management Plan (QMP)**

### **1. Design**

The Design/Build Firm shall be responsible for the professional quality, technical accuracy, and coordination of all surveys, designs, drawings, specifications, geotechnical, and other services furnished by the Design/Build Firm under this contract.

The Design/Build Firm shall provide a Design QMP, which describes the Quality Control (QC) procedures to be utilized to verify, independently check, and review all design drawings, specifications, and other documentation prepared as a part of the contract. In addition, the QMP shall establish a Quality Assurance (QA) program to confirm that the QC procedures are followed. The Design/Build Firm shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The QMP may be one utilized by the Design/Build Firm as part of their normal operation or it may be one specifically designed for this project. The Design/Build Firm shall submit a QMP within 15 working days of the written Notice to Proceed. A marked up set of prints from the QC review will be sent in with each review submittal. The responsible Professional Engineers or Professional Surveyor that performed the QC review, as well as the QA manager, will sign a statement certifying that the review was conducted.

The Design/Build Firm shall, without additional compensation, correct all errors or deficiencies in the surveys, designs, drawings, specifications, and/or other services.

No fabrication, casting, or construction will occur until all related design review and shop drawing review comments are resolved.

### **2. Construction**

The Design/Build Firm shall be responsible for developing and maintaining a Construction QC Plan in accordance with Section 105 of Standard Specifications which describes their QC procedures to verify, check, and maintain control of key construction processes and materials.

The sampling, testing, and reporting of all materials used shall be in compliance with the Sampling, Testing and Reporting Guide (STRG) provided by the Department. The Design/Build Firm will use the Department's database(s) to allow audits of materials used to assure compliance with the STRG. The Department has listed the most commonly used materials and details in the Department's database. When materials being used are not in the Department's database list, the Design/Build Firm shall use appropriate material details from the STRG to report sampling and testing. Refer to the "Access Instruction for LIMS" for more information on how to gain access to the Department's databases: <http://www.dot.state.fl.us/statematerialsoffice/quality/programs/qualitycontrol/contractor.shtm>

Prepare and submit to the Engineer a Job Guide Schedule (JGS) using the Laboratory Information Management System (LIMS), 21 calendar days prior to commencement of construction. Update the Job Guide Schedule and submit it to the Engineer prior to each monthly progress estimate. The Department may not authorize payment of any progress estimate not accompanied by an up-to-date JGS. Maintain the JGS throughout the project, including the quantity placed since the previous submittal, and total to date quantity and any additional materials placed. Do not commence work activities that require testing until the JGS has been reviewed and accepted by the Engineer. At final acceptance, submit a final JGS that includes all materials used on the project in the same format as the monthly reports.

The Department shall maintain its rights to inspect construction activities and request any documentation from the Design/Build Firm to ensure quality products and services are being provided in accordance with the Department's Materials Acceptance Program.

**R. Liaison Office**

The Department and the Design/Build Firm will designate a Liaison Office and a Project Manager who shall be the representative of their respective organizations for the project.

**S. Schedule of Values**

The Design/Build Firm will be responsible for invoicing the Department based on current invoicing policy and procedure. Invoicing will be based on the completion or percentage of completion of major, well-defined tasks as defined in the schedule of values. Final payment will be made upon final acceptance by the Department of the Design/Build project. Tracking DBE participation will be required under normal procedures according to the CPAM. The Design/Build Firm must submit the schedule of values to the Department for approval. No invoices shall be submitted prior to Department approval of the schedule of values.

Upon receipt of the invoice, the Department's Project Manager will make judgment on whether or not work of sufficient quality and quantity has been accomplished by comparing the reported percent complete against actual work accomplished.

**T. Computer Automation**

The project shall be developed utilizing computer automation systems in order to facilitate the development of the contract plans. Various software and operating systems were developed to aid in assuring quality and conformance with Department policies and procedures. Seed Files, Cell Libraries, User Commands, MDL Applications and related programs developed for roadway design and drafting are available for the MicroStation V8 format in the FDOT CADD Software Suite. However, it is the responsibility of the Design/Build Firm to obtain and utilize current Department releases of all CADD applications.

The Design/Build Firm's role and responsibilities are defined in the Department's CADD Manual. The Design/Build Firm will be required to submit final documents and files which shall include complete CADD design and coordinate geometry files in Intergraph / MicroStation format, as described in the above referenced document.

The archived submittal shall also include either a TIMS database file, CADD Index file (generated from RDMENU), or documentation that shall contain the project history, file descriptions of all (and only) project files, reference file cross references, and plotting criteria a (e.g. batch, level symbology, view attributes, and display requirements). A printed directory of the archived submittal shall be included.

#### **U. Construction Engineering and Inspection**

The Department is responsible for providing CEI and QA Engineering.

The Design/Build Firm is subject to the Department's Independent Assurance (IA) Procedures.

#### **V. Testing**

The Department or its representative will perform verification and resolution testing services in accordance with the latest Specifications. On all Federal Aid Projects, the Department or its representative shall perform verification sampling and testing on site as well as off site locations such as pre-stress plants, batch plants, structural steel and weld, fabrication plants, etc.

Per FHWA guidance, the Systems Engineering Process consists of tying contract and functional requirements to verification methods using a Requirements Traceability Verification Matrix (RTVM). The Department shall provide the project RTVM to the Design/Build Firm for their use in verifying that all project requirements are met. The RTVM is a table that lists requirements from the RFP and MTR by section and description. The Design/Build Firm must verify each requirement within the RTVM using one of four methods of verification: analysis, demonstration, inspection or testing. The final completed RTVM shall be delivered to the Department prior to Final Acceptance.

All items requiring a test must be included in the Design/Build Firm developed Test Evaluation Matrix. The Design/Build Firm shall utilize this Test Evaluation Matrix to develop the project test plans for the Factory Acceptance Tests, Standalone Tests, Subsystem Tests and 30 consecutive calendar day Operational Test.

#### **W. Value Added**

The Design/Build Firm may provide Value Added Project Features, in accordance with Article 5-14 of the Specifications, for the following features:

- CCTV camera system components
- Vehicle detection system components
- DMS system components
- HAR and RWIS system components
- Communication components – Test equipment and software/hardware
- And any other products or features the Design/Build Firm desires

The Design/Build Firm shall develop the Value Added criteria, measurable standards, and remedial work plans in their technical proposal for features proposed by the Design/Build Firm.

#### **X. Adjoining Construction Projects**

The Design/Build Firm shall be responsible for coordinating construction activities with other construction projects that are impacted by or impact this project. This includes projects under the jurisdiction of local governments, the Department, or other regional and state agencies.

The Design/Build Firm shall be responsible for coordinating with the Department's design consultants who are developing plans for future I-75 improvements within Sarasota and Manatee Counties.

Listed below are ongoing projects within the FMS limits. This list is not all inclusive.

- Sarasota ATMS Phases 1-3 – TRIP/JPA projects managed by Sarasota County
- 406314-5-52-01 – I-75 at Laurel Road, includes traffic signal work

#### **Y. Design Issue Escalation**

The Department has established the issue escalation process for design questions and conflict resolution that the Design/Build Firm shall follow unless revised by the Partnering Agreement. All issues are to be directed to the Department Project Manager. If the issue cannot be resolved at this level, the Department Project Manager shall forward the issue to the next level in the process. The escalation process begins with the District Design Engineer, followed by the Director of Transportation Operations, and finally to the District Secretary. Each level shall have a maximum of three working days to answer, resolve, or address the issue. This three-day window is a response time and does not infer resolution. Questions may be expressed verbally and followed up in writing. The Department Project Manager will respond in a timely manner but not to exceed three working days. The Design/Build Firm shall provide any available supporting documentation.

The Design/Build Firm shall provide a similar issue escalation process for his organization with personnel of similar levels of responsibility.

The District Secretary will have the final authority on design decisions.

#### **Z. Construction Clarification, Conflict Resolution, and Issue Escalation**

In the event that construction problems occur, the resolution of those problems will be processed in one of the following two ways unless revised by a Partnering Agreement:

- If the resolution does not change the original intent of the Technical Proposal/RFP, the Design/Build Firm EOR will be responsible for developing the design solution to the construction problem and the District Resident Engineer will be responsible for review and response within 10 working days. The District Resident Engineer will either concur with the proposed solution or, if the District Resident Engineer has concerns, the issue will be escalated as described in the process below.
- If the resolution does alter the original intent of the Technical Proposal/RFP, the EOR will develop the proposed solution, copy in the District Resident Engineer, and send it to the District Construction Office for review and response through the Department Project Manager. The District Construction Office will respond to the proposed solution within 10 working days. The District Construction Office will either concur with the proposed solution or, if the District Resident Engineer has concerns, the issue will be escalated as described in the process below. Changes to the original intent of the Technical Proposal/RFP will require a contract change order and FHWA approval.
- The Department has established the issue escalation process for construction questions and conflict resolution that the Design/Build Firm shall follow unless revised by the Partnering Agreement. All issues are to be directed to the Department Project Manager. If the issue cannot be resolved at this level, the Department Project

Manager shall forward the issue to the next level in the process. The escalation process begins with the District Construction Engineer, followed by the Director of Transportation Operations, and finally to the District Secretary. Each level shall have a maximum of three working days to answer, resolve or address the issue. This three-day window is a response time and does not infer resolution. Questions may be expressed verbally and followed up in writing. The Department Project Manager will respond in a timely manner but not to exceed three working days. The Design/Build Firm shall provide any available supporting documentation.

The Design/Build Firm shall provide a similar chain of command for his organization with personnel of similar levels of responsibility.

**Should an impasse develop, the Dispute Review Board shall assist in the resolution of disputes and claims arising out of the work on the Contract.**

## **VI. Design and Construction Criteria.**

### **A. General**

The Design/Build Firm shall be responsible for: detailed plan checking as outlined in the PPM, in the RFP, and the Design and Construction criteria package. This includes a checklist of the items listed in the PPM for each completed phase submittal. Roadway submittals may be broken down into grading, drainage, walls, ITS, signing & pavement marking, signalization, landscaping and final geometry components. The component design must be in conformity with the Design and Construction Criteria requirements, approved preliminary layout and concept as provided in the Technical Proposal.

Before construction activities can begin for a specific component, signed and sealed design plans and calculations supporting the design for that component must be reviewed by the Department. Component submittals shall be complete submittals along with all the supporting information necessary for review. The work must represent logical work activities and must show impacts on subsequent work on this project. Any modification to the component construction due to subsequent design changes as the result of design development is solely the Design/Build Firm's risk. Upon review by the Department, the plans will be stamped "Released for Construction" and initialed and dated by the reviewer. Any construction initiated by the Design/Build Firm prior to receiving signed and sealed plans stamped "Released for Construction" shall be at the sole risk of the Design/Build Firm.

All design and construction documents shall be prepared using the English system.

The FMS components shall be placed to meet minimum clear zone requirements. New guardrail shall not be used to reduce clear zone requirements. Components may be placed behind existing guardrail but shall have adequate room for access and maintenance activities. Do not place components in areas that require shutting down a lane for maintenance activities. All work shall be within the existing right-of-way. The Design/Build Firm shall take responsibility for litter removal and mowing a five foot perimeter around all installed boxes, pole/device installations, staging areas, and stockpile areas. The Design/Build Firm shall coordinate with affected local maintaining agencies to eliminate work conflicts. This total cost shall be included in the Design/Build Firm's price proposal.

Place all fiber communications in conduit, pull boxes, and splice vaults separate from all other cables or wires to any components on the project.

All concrete poles (except index 17504, service point details) shall have concrete foundations to be designed by a licensed structural engineer.

Attachment to existing bridges shall be designed by a licensed structural engineer. Overhead or upwardly inclined installations of Adhesive Anchors are prohibited regardless of their design safety factor. There shall be no overstress to any structural element of the bridge as a result of any new attachment.

Existing signal structures and foundations (mast arms, strain pole, etc..) that will carry additional loads shall be investigated for structural adequacy according to current standards by a licensed structural engineer.

## **B. Geotechnical Services**

### **Driven Pile Foundations for Bridges and Major Structures (Not Applicable to this Project)**

#### **Drilled Shaft Foundations for Bridges and Major Structures**

The Design-Build Firm shall perform a subsurface investigation, analysis and design for all aspects of the project in accordance with FDOT standards, policies and procedures. Existing subsurface information may be used. Supplemental subsurface investigation and testing will be required to ensure all aspects of the project are covered. The Department reserves the right to observe and perform verification testing on any drilled shafts during any phases of the foundation operation.

The Design/Build Firm shall determine whether the resistance factors used for drilled shaft design will be based on load testing. Before the resistance factors for load testing may be used for drilled shafts in any of the following areas of the project, successful load tests must be performed in representative locations of that area.

The Design-Build Firm shall develop a Foundation Plan (FP) for drilled shaft construction. Submit the proposed FP to the CEI Geotechnical Engineer for review and recommendation to the District Geotechnical Engineer for approval. The FP is intended to establish process control standards and quality assurance for drilled shaft construction. Include in the FP the items required in Specification 455-15.1.2 (Drilled Shaft Installation Plan), the equipment and procedures for visual inspection of drilled shaft excavations, and any additional methods to identify and remediate drilled shaft deficiencies. If the FP is updated based on the construction of the test shaft(s), or other changes in circumstances, the update will not be in effect until approved by the CEI Geotechnical Engineer.

The FP will be used to govern all drilled shaft construction activities. In the event that deviations from the FP are observed, the CEI Geotechnical Engineer CEI Geotechnical Engineer may perform Independent Verification Testing/Review of the Design-Build Firm's equipment, procedures, personnel and drilled shaft construction FP at any time during production drilled shaft construction. If, as determined by the CEI Geotechnical Engineer, drilled shaft construction equipment, procedures and/or personnel for the FP is deemed inadequate to consistently provide drilled shafts meeting the contract requirements, the Design-Build Firm's FP approval may be withdrawn pending corrective actions. All drilled shaft construction activities shall then cease and not restart until corrective actions have been taken and the FP has been re-approved.

The FDOT reserves the right to observe and perform verification testing on any drilled shafts during any phases of the foundation operation.

The Design-Build Firm shall be responsible for the following:

- Evaluating geotechnical conditions and designing the foundations including the drilled shaft diameter and length, and construction methods to be used.
- Completing the subsurface investigation and drilling pilot holes prior to establishing the drilled shaft tip elevations and socket requirements.
- Determining the location of the test shaft(s) and the types of tests that will be performed on the test shaft(s).
- Providing test hole pilot boring results to the District Geotechnical Engineer at least 48 hours before beginning test shaft construction.
- Constructing the method shaft (test hole) successfully and conducting integrity tests on the shaft using both crosshole sonic logging and gamma-gamma density logging test methods. More than one test hole will be required when there are shafts both on land and in water. When there is more than one size of drilled shaft, perform a test hole for the largest diameter for each condition (land and water).
- Providing all personnel and equipment to perform a load test program on the test shaft(s). The frequency of static tests, Osterberg Cell tests or Statnamic tests will be dictated by the variability of the geology and the size of the project. Provide sufficient instrumentation to determine side friction components in segments not longer than five ft and the end bearing component. Provide a caliper tool or system to measure accurately and continuously the actual shape of test shafts prior to placing concrete.
- Determining the production shaft lengths. Production shaft lengths may be based on the load transfer characteristics measured during the load test. End bearing characteristics may be based on load test results if the properties of the material below the tips of the production shafts meet or exceed the strength of the materials below the tip of the test shaft. If the theoretical bearing strength of the material below the tips of the production shafts is less than the theoretical bearing strength of the materials below the tip of the test shaft, the production shafts shall be extended to meet design capacity by side shear only, unless the end bearing resistance of the weaker material is verified by additional load testing.
- Documenting and providing a report that includes all test shaft data, analysis, and recommendations to the District Geotechnical Engineer. The report should include but not be limited to the following: results of the load testing program, crosshole sonic logging, gamma-gamma density logging, pilot borings for all drilled shafts, and recommended production drilled shaft tip elevations and socket requirements. This report shall be signed and sealed by a Florida licensed Professional Engineer and shall be submitted to the District Geotechnical Engineer for review and approval at least five working days prior to beginning production shaft construction. Additional data or analysis may be required by the Engineer.
- Constructing all drilled shafts to the required tip elevation and socket requirements.

- Verifying level and clean hole bottom conditions and properties of the drilling fluid at the time of concrete placement.
- Furnishing and using an underwater television camera or any other approved Shaft Inspection Device to continuously videotape the inspection of each excavation for a drilled shaft bridge foundation after final cleaning. By audio or other means, recordings shall clearly identify the location and items being observed.
- Documenting and submitting the drilled shaft excavation and concreting logs to the District Geotechnical Engineer within 24 hours of concrete placement. The documentations shall include the drilled shaft installation procedures and sequencing as well as any problems encountered during construction and concrete placement.
- Allow three working days for the District Geotechnical Engineer to review the data before any further construction on the tested shafts.
- Performing Cross-Hole Sonic Logging (CSL) tests on all nonredundant drilled shafts supporting bridges. For redundant drilled shaft bridge foundations and drilled shaft foundations for miscellaneous structures, perform CSL on at least 30% of the shafts (rounded up to the next whole number) on shafts selected by the Department.
- Repairing all detected defects and conducting post repair integrity testing using 3D tomographic imaging and gamma-gamma density logging. Submitting all results to the District Geotechnical Engineer within five days of test completion.
- Submitting the Foundation Certification Packages.
  - Each Foundation Certification Package shall contain an original signed and sealed letter certifying capacity and integrity of all drilled shafts, and clearly legible copies of all shaft excavation and concreting logs, video-tapes of visual shaft bottom inspections, all CSL reports and electronic data, slurry test data, supplemental testing data and analyses for the foundation unit. The certification shall not be contingent on any future testing or approval by FDOT.
  - Submit two copies of the Foundation Certification Package signed and sealed by the Geotechnical Foundation Design Engineer of Record to FDOT within three weeks of finishing each foundation unit and prior to Verification Testing. A foundation unit is defined as all the shafts within one bent or pier for each phase of each bridge.
- Providing safe access and needed equipment, and cooperating with and working with the Department in verification of the drilled shafts, both during construction of shafts and after submittal of the certification package.
  - The Department may verify the bottom cleanliness of all drilled shaft excavations prior to and at the time of concreting. The Department may verify bottom cleanliness by over the shoulder review of the Design-Build Firm's visual inspection methods and/or by independent means.

- The Department may verify properties of drilling fluid at the time of concreting. The Department shall determine whether verification of drilling fluid properties shall be accomplished by over the shoulder review of the Design-Build Firm's slurry testing and/or by independent means.

Within two working days of receipt of a Foundation Certification Package, the Department will examine the certification package and determine whether shafts in that foundation unit will be selected for Verification Testing. The Department may select every shaft for Verification Testing, if defects are suspected. The Department will provide equipment and personnel as needed for Verification Testing. Methods used for Verification Testing of a completed shaft are at the discretion of the Department and may include coring, cross-hole sonic logging, gamma-gamma density logging, low-strain dynamic integrity testing, or other methods.

After Verification Testing for a foundation unit is performed, the Department will provide the results within five working days. Integrity testing access tubes shall not be grouted and construction of footings, caps, columns or any superstructure elements shall not occur until the Department has notified the Design-Build Firm that additional Verification Testing is not required.

If any shaft is found to be deficient, the Design-Build Firm shall correct the deficiency (i.e. repair or replace the shaft) and/or modify the design to compensate for the deficiency. After the deficiency is corrected, retest and recertify the shaft. The Department may then perform additional Verification Testing. In case of disagreement of test results, the Department's results will be final and used for determination of acceptance.

#### **Drilled Shaft Foundations for Miscellaneous Structures**

The Design/Build Firm shall be responsible for the following:

- Evaluating geotechnical conditions and designing the foundations including the drilled shaft diameter and length, and construction methods to be used.
- Completing the subsurface investigation prior to establishing the drilled shaft tip elevations and socket requirements.
- Constructing the method shaft (test hole) successfully and conducting integrity tests on the shaft using crosshole sonic logging. More than one test hole will be required when there are shafts both on land and in water. When there is more than one size of drilled shaft, perform a test hole for the largest diameter for each condition (land and water).
- Determining the production shaft lengths.
- Documenting and providing a report that includes all data, analysis, and recommendations to the Department. The report should include but not be limited to the following: results of pilot borings for all drilled shafts, and recommended production drilled shaft tip elevations and socket requirements. This report shall be signed and sealed by a Florida licensed Professional Engineer and shall be submitted to the Department for review and approval at least seven (7) calendar days prior to beginning production shaft construction. Additional data or analysis may be required.

by the Engineer. Constructing all drilled shafts to the required tip elevation and socket requirements.

- Verifying level and clean hole bottom conditions and properties of the drilling fluid at the time of concrete placement.
- Documenting and submitting the drilled shaft construction logs to the Department within 24 hours of concrete placement. The documentations shall include the drilled shaft installation procedures and sequencing as well as any problems encountered during construction and concrete placement. Allow five (5) calendar days for the Department to review the data before any further construction on the shafts.
- Performing Cross-Hole Sonic Logging (CSL) tests on at least 30% of the shafts (rounded up to the next whole number) selected by the Department.
- Repairing all detected defects and conducting post repair integrity testing using 3D tomographic imaging and gamma-gamma density logging. Submitting all results to the Department within seven (7) calendar days of test completion.
- Submitting the Foundation Certification Packages.
  - Each Foundation Certification Package shall contain an original signed and sealed letter certifying capacity and integrity of all drilled shafts, and clearly legible copies of all shaft excavation and concreting logs, all CSL reports and electronic data, slurry test data, supplemental testing data and analyses for the foundation unit. The certification shall not be contingent on any future testing or approval by FDOT.
  - Submit two copies of the Foundation Certification Package signed and sealed by the Geotechnical Foundation Design Engineer of Record to FDOT within three weeks of finishing each foundation unit and prior to Verification Testing. A foundation unit is defined as all the shafts within one intersection/interchange or for each phase of an intersection/interchange.
- Providing safe access and needed equipment, and cooperating with and working with the Department in verification of the drilled shafts, both during construction of shafts and after submittal of the certification package.
  - The Department may verify the bottom cleanliness of all drilled shaft excavations prior to and at the time of concreting. The Department may verify bottom cleanliness by over the shoulder review of the Design/Build Firm's inspection methods and/or by independent means.
  - The Department may verify properties of drilling fluid at the time of concreting. The Department shall determine whether verification of drilling fluid properties shall be accomplished by over the shoulder review of the Design/Build Firm's slurry testing and/or by independent means.

Within four (4) calendar days of receipt of a Foundation Certification Package, the Department will examine the certification package and determine whether shafts in that foundation unit will be selected for Verification Testing. The Department may select every shaft for Verification Testing, if defects are suspected. The Department will provide equipment and personnel as needed for Verification Testing. Methods used for Verification Testing of a completed shaft are at the discretion of the Department and may include coring, cross-hole sonic logging, gamma-gamma density logging, low-strain dynamic integrity testing, or other methods.

After Verification Testing for a foundation unit is performed, the Department will provide the results within seven (7) calendar days. Integrity testing access tubes shall not be grouted and construction of caps, columns or any superstructure elements shall not occur until the Department has notified the Design/Build Firm that additional Verification Testing is not required.

If any shaft is found to be deficient, the Design/Build Firm shall correct the deficiency (i.e. repair or replace the shaft) and/or modify the design to compensate for the deficiency. After the deficiency is corrected, the shaft shall be retested and recertified by the Design/Build Firm. The Department may then perform additional Verification Testing. In case of disagreement of test results, the Department's results will be final and used for determination of acceptance.

### **C. Utility Coordination**

The Design/Build Firm shall utilize a single dedicated person responsible for managing all utility coordination. This person shall be contractually referred to as the Utility Coordination Manager and shall be identified in the Design/Build Firm's proposal. The Design-Build Firm shall notify the Department in writing of any change in the identity of the Utility Coordination Manager. The Utility Coordination Manager shall have the following knowledge, skills, and abilities:

1. A minimum of 4 years of experience performing utility coordination in accordance with Department standards, policies, and procedures.
2. Knowledge of the Department plans production process and utility coordination practices,
3. Knowledge of Department agreements, standards, policies, and procedures.

The Design/Build Firm's Utility Coordination Manager shall be responsible for managing all utility coordination, including, but not limited to, the following:

1. Ensuring that all utility coordination and activities are conducted in accordance with the requirements of the Contract Documents.
2. Identifying all existing utilities and coordinating any new installations. Reviewing proposed utility permit application packages and recommending approval/disapproval of each permit application based on the compatibility of the permit as related to the Design/Build firm's plans.
3. Scheduling utility meetings, keeping and distribution of minutes of all utility meetings, and ensuring expedient follow-up on all unresolved issues.
4. Distributing all plans, conflict matrixes and changes to affected utility owners and making sure this information is properly coordinated.
5. Identifying and coordinating the execution and performance under any agreement that is required for any utility work needed in with the Design/Build project. Reviewing, approving, signing and coordinating the implementation of all Utility Work Schedules.
6. Resolving utility conflicts.

7. Obtaining and maintaining Sunshine State One Call Design to Dig Tickets.
8. Performing Constructability Reviews of plans prior to construction activities with regard to the installation, removal, temporary removal, de-energizing, deactivation, relocation, or adjustment of utilities.
9. Providing periodic project updates to the Department Project Manager and District Utility Office as requested.
10. Coordination with the Department on any issues that arise concerning reimbursement of utility work costs.

The Design/Build Firm shall be responsible for performing or arranging for the performance of all utility work and for paying all costs associated herewith including, but not limited to:

- Locate by physical exposure and establishment of both vertical and horizontal limits of all existing facilities within ten (10) feet of the proposed fiber installation. The department will provide locates for FDOT owned facilities.
- Notify and keep all utility agencies/owners informed.
- Determine what work is necessary for utilities that are impacted. Including, but not limited to: design around, if possible, protect, adjust, and/or relocate.
- Obtain all necessary arrangements and/or permits, and otherwise comply with applicable laws, including, but not limited to, Sunshine One Call obligation under Chapter 556, Florida Statutes.

Any utilities within Department right-of-way in the project area that are in conflict with the proposed construction shall be redesigned and relocated at the Design/Build Firm's expense, in accordance with provisions in the permit(s), the current Utility Accommodation Manual, Section 337.403, Florida Statutes and/or Rule 14-46.001 of the Florida Administrative Code. All costs associated with utility relocation work shall be included as part of the Price Proposal. The work may be performed by, either the utility owner or the Design/Build Firm. If the utility owner chooses to allow the Design/Build Firm to do utility relocation/construction, then a Storm Water Pollution Prevention Plan (SWPPP) and Erosion Control Plan (ECP) must be approved before commencing construction.

It is the Design/Build Firm's responsibility to identify and contact all appropriate utility owners that will be affected by construction. The Department will make available to the Design/Build Firm for inspection all utility permits and utility relocation information upon written request; however, the Department makes no representation as to the completeness or accuracy of such information and the Design/Build Firm relies on the completeness or accuracy of such information at its own risk.

It is anticipated that Department, Sarasota County, Manatee County and local road and utility construction projects will be in progress during the life of this Contract. The Design/Build Firm shall be required to coordinate their construction operations with those of other Firms doing work for the State, County and City governments. This coordination includes on-site cooperation and scheduling of work to eliminate or minimize any rework or duplication of effort.

If a utility is impacted by the design or unintentionally during construction, the cost of the relocation/repair will be the responsibility of the Design/Build Firm. If the utility is not being impacted by construction, but the utility owner desires to relocate the utility, the cost of the relocation will be the responsibility of the utility company.

The Design/Build Firm shall make every attempt to design around existing utilities, minimizing impact. Any potential utility conflict shall be physically exposed and verified both vertically and horizontally prior to any excavation. Plans shall be provided to the Department showing existing and proposed utility locations and their relationships to the proposed construction. It will be the Design/Build Firm's responsibility to coordinate and resolve all utility impacts with each of the utility companies. It therefore becomes the Design/Build Firm's liability for all construction delays due to utility conflicts and the Design/Build Firm's responsibility for all damages done to existing utilities. This includes all relocations and protection during construction.

The Department has reviewed the project limits and has determined which utility facilities located within the project limits may be impacted by the Project and whether the cost of any necessary utility work as to that impacted utility is to be borne by the utility or by the Design-Build Firm. That information is contained herein. The following UA/O's have been identified by the Department as having facilities within the project corridor which may be impacted by the Project. Also provided below is a determination made by the Department as to the eligibility of reimbursement for each potentially impacted UA/O identified herein.

UA/O	Eligible for Reimbursement (Y/N)
ATT/T	Y
BRADEN RIVER UTILITIES, INC.	Y
CITY OF BRADENTON	Y
FLORIDA GAS TRANSMISSION-FT MYERS	Y
FLORIDA POWER & LIGHT	Y
FPL FIBERNET	Y
FLORIDA POWER & LIGHT	Y
GULFSTREAM NATURAL GAS SYSTEM, L.L.C.	Y
VERIZON FLORIDA INC	Y
LAKWOOD RANCH COMMUNITY DEVELOPMENT DI	Y
BRIGHT HOUSE NETWORKS MANATEE	Y
MANATEE COUNTY TRANSPORTATION/UTILITY	Y
TECO - PEOPLES GAS- SARASOTA	Y
PEACE RIVER ELECTRIC COOPERATIVE, INC.	Y
SARASOTA COUNTY TRAFFIC	Y
SARASOTA COUNTY UTILITIES	Y
COMCAST CALBEVISION OF WEST FLORIDA	Y
AQUA UTILITIES FLORIDA INC	Y
CITY OF NORTH PORT UTILITIES	Y
CITY OF SARASOTA PUBLIC WORKS	Y
CITY OF VENICE UTILITIES DEPT.	Y
LEVEL 3 COMMUNICATIONS LLC	Y
PEACE RIVER/ MANASOTA REGIONAL WATER SU	Y

It is the intention of the Department that the Design/Build Firm makes every effort to avoid impacting all existing utilities to the fullest extent and the plan design shall reflect this direction.

#### **D. Intelligent Transportation System (ITS)**

The following are descriptions of the major project elements and required services for this project, which include, but are not limited to:

**Design Services** – Provide complete design for the installation of ITS field elements, which includes CCTV cameras; non-intrusive vehicle detectors; DMS; HAR; RWIS; emergency generator back-up system; fiber optics backbone cable; communications between ITS field elements and the RTMC and the STMC. The Design Services shall include all survey, site visits, obtaining all necessary utility and base plans, and arranging for all required coordination on relevant issues that will be required for the complete design of the system. The design shall consider future known design and construction roadway projects. The design shall minimize impacts to the ITS field devices and communications infrastructure by adjusting grade lateral setback to reduce later relocation or replacement but without affecting the system operation. Conduit and fiber installed in the median, at interchanges, and other areas may need to be at a greater depth to avoid future construction activities. Pull boxes and splice vaults shall not be installed on slopes. Present the design in the form of signed and sealed construction plans prepared by a Florida registered Professional Engineer. Provide supporting documents such as the system configuration diagram and the structural calculations of the ITS field elements structures along with the construction plans.

**CCTV Cameras** – Install CCTV cameras as part of this project. The Design/Build Firm is responsible to determine the number and location needed to meet the requirements of the MTRs. Do not place CCTV cameras in the median or on an overpass. Convert the NTSC camera video images into optical signals and transmit on fiber optic cable using Ethernet technology. Send the camera control data signals as a sub-channel on the fiber optic cable. The CCTV cameras located within the project will be located on new concrete poles. It is the responsibility of the Design/Build Firm to verify the right-of-way for all proposed camera locations and provide final locations of these cameras. The Design/Build Firm will identify all equipment that is necessary to transmit full motion camera video images to the RTMC and STMC and bi-directional control of the cameras. The CCTV cameras installed as part of this project will be located on new concrete poles.

**Detectors** – Install non-intrusive vehicle detectors as part of this project. The Design/Build Firm is responsible to determine the number and location needed to meet the requirements of the MTRs. Do not place detectors in the median or on an overpass. Each detector shall be capable of detecting up to eight lanes of vehicles and shall provide roadway vehicle information including speed, volume, and occupancy. In no way shall the installation of detectors impede vehicular traffic. Transmit the detection data to the RTMC and STMC through the fiber optic cable utilizing Ethernet technology. The Design/Build Firm will identify all equipment that is necessary to transmit data to the RTMC and STMC. It is the responsibility of the Design/Build Firm to verify the right-of-way for all proposed detector locations and provide final locations of the detectors. The detectors located within the project will be located on new concrete poles.

**DMS** – Install 25 DMSs as part of this project. Attachment B – Conceptual Device Layout shows the potential locations of the proposed DMS. The Design/Build Firm is responsible for determining the actual number and locations needed to meet the requirements of the MTRs. Mount the DMSs on steel overhead cantilever or truss structures. The DMSs will be capable of displaying text messages to motorists. In no way shall the installation of DMSs impede vehicular traffic. Transmit the bi-directional data from the DMSs to the RTMC and STMC through the fiber optic cable utilizing Ethernet technology. The Design/Build Firm will identify all equipment that is necessary to transmit data to the RTMC and

STMC. It is the responsibility of the Design/Build Firm to verify the right-of-way for all proposed DMS locations and provide final locations of the DMS.

**HAR** – Install 10 HAR transmitters and 20 beacon signs as part of this project. Attachment B – Conceptual Device Layout shows the potential locations of the proposed HAR system. The Design/Build Firm is responsible for determining the actual number and location needed to meet the requirements of the MTRs. The HAR system will provide continuous coverage within the project limits providing a synchronized global message to all transmitters. The system will also provide each transmitter in the system with the ability to broadcast a different unique message. The system will provide for adjustment of each transmitter's output to minimize overlap between transmitters when transmitting different messages. Transmit the HAR data through the fiber optic cable utilizing Ethernet technology. The Design/Build Firm will identify all equipment that is necessary to transmit data from the RTMC and STMC. It is the responsibility of the Design/Build Firm to verify the right-of-way for the proposed HAR locations and to provide the final locations of the HAR components.

**RWIS** – Install two (2) RWIS units as part of this project. Attachment B – Conceptual Device Layout shows the potential locations of the proposed RWIS. The Design/Build Firm is responsible for determining the final locations of the RWIS installations. Mount the RWIS along the roadside following the method recommended by the vendor. The RWIS will be capable of providing data on conditions of the roadway. Transmit the RWIS data through the fiber optic cable utilizing Ethernet technology. The Design/Build Firm will identify all equipment that is necessary to transmit data to the RTMC and STMC. It is the responsibility of the Design/Build Firm to verify the right-of-way for the proposed RWIS location and to provide the final location for the RWIS.

**Communications Infrastructure** – Communications from the ITS field elements to the RTMC and STMC will be through Ethernet technology utilizing single mode fiber optic cable (96 strand trunkline along I-75) as the communications medium. It is the responsibility of the Design/Build Firm to design the communications utilizing a series of 100 and 1000 Mbps Ethernet switches. The Design/Build Firm shall identify the number and locations of the communication hubs that would house the 1000 Mbps (Gig-E) Ethernet switches. House the Ethernet switches in an environmentally controlled cabinet or building, so to not impede the functionality of the Ethernet switches in any manner. Each ITS field element location shall include an IP Edge Switch that in turn connects to a Hub switch. It is the responsibility of the Design/Build Firm to identify all the equipment that is required, including media converters, terminal servers, transceivers, modems, etc. to ensure the proper communication (video and data) between the ITS field elements and the RTMC and STMC. The communications connection to the STMC is via an existing 48-strand fiber optic trunkline between the STMC facility and the SR 70 interchange. The Design/Build Firm will test the 48-strand fiber within 30 days of contract execution (after providing 10 days advance notice to the Department), and will notify the Department of the condition of the existing fiber regarding the quality of the communication link to the STMC within 15 days of the test. The Department will perform any necessary repairs to the 48-strand fiber trunkline.

**Construction/Build Services** – Construction/Build services include the procurement and installation of all equipment related to ITS field elements and communication components/elements as specified herein. The equipment to be procured shall meet the requirements and the NTCIP protocol (if applicable) versions supported by the SunGuide® software specified in the MTR. The Design/Build Firm is responsible for ensuring 100 percent compatibility of device components with the SunGuide® software at the time of deployment. The proposed ITS equipment shall conform to the *Interface Control Document* for the various devices listed online at <http://sunguide.datasys.swri.edu/>.

The Design/Build Firm shall submit cut sheets of all selected technologies/products for procurement for the project along with selection alternatives, and the reasons for selection, to the Department for

acceptance. It is up to the Department or its representative to request a demonstration of the equipment for approval. No procurement of any hardware, software, or services shall occur until the Department reviews and accepts the construction plans and cut sheets. The Design/Build Firm may request a partial acceptance of an individual subsystem design in order to allow advance procurement of equipment that requires a longer lead-time.

**Testing Services** – Test all equipment and systems furnished and installed by the Design/Build Firm to determine conformance with project requirements and contract documents. Provide testing documents to the Department for review. Testing requirements for the individual subsystems are as defined in the MTR. Testing of the equipment and system shall include:

- Factory acceptance tests that are conducted prior to equipment procurement and installation
- Standalone tests, conducted following the field installation, but prior to connection with the rest of the system
- Subsystem tests that are performed after the completion of the field installation
- Final acceptance occurs after completion of the System Operational Test and the burn-in period. The Department will perform a final inspection of the entire system in the presence of a representative of the Design/Build Firm.

Submit all “As-built” documentation to the Department prior to the start of the System Operational Test. Final acceptance of the work associated with this project will be made after all of the required submittals, testing, training, documentation, and warranties have been successfully completed as specified in the MTRs as well as in the requirements of the Department’s latest version of the Standard Specifications for Road and Bridge Construction and all applicable standards.

**Integration Services** – Deliver and operate each of the ITS field elements, including CCTV cameras, DMSs, RWIS, HAR, and VDS, as an individual system. It is the responsibility of the Design/Build Firm to integrate the subsystems into the RTMC and STMC. The Design/Build Firm shall integrate the individual ITS field elements (i.e., CCTV cameras, DMSs, HAR, and detection devices) with the respective vendor-provided subsystem software such that each of the subsystems operates as a stand-alone system.

The integration of various subsystems with the central SunGuide® software is the responsibility of the Design/Build Firm. Coordinate the integration with the SWIFT SunGuide® Center IT Manager after the Design/Build Firm tests and the Department accepts the individual ITS subsystems. The Design/Build Firm is responsible for providing all the hardware and any other software packages required for operation of the SunGuide® software, including all other requirements specified in the MTRs.

The Design/Build firm shall provide all equipment necessary to integrate the new video feeds into the existing video wall display at the RTMC and the new video wall display at the STMC.

The Design/Build Firm shall provide all equipment necessary to integrate the new emergency generator back-up system into the existing RTMC and the new STMS for remote monitoring of permanent mount generators with automatic transfer switches.

The Design/Build Firm shall provide furniture for the offices at the Sarasota-Manatee County STMC as described in the MTRs. All installed furniture shall be fully assembled and functional for an office environment.

**Training Services** – Provide complete training for the operations and maintenance of ITS subsystems – CCTV cameras, DMSs, RWIS, the HAR system, VDS, communication, emergency generator back-up system and field troubleshooting/testing. Tailor and focus training to the individual functional group such as the operators, maintenance technicians, managers, and system administrators. The requirements for the training along with the duration of the training for each subsystem are included in the MTRs. Training will commence only after the subsystem tests have been accepted by the Department.

**Documentation** – Provide complete and comprehensive documentation of all elements of this project as specified in the MTRs. Documentation shall include, at a minimum:

- Field equipment operational manuals
- Software manuals
- Device protocols
- Warranty documentation
- Test Evaluation Matrix
- Testing of each of the subsystems
- Training for each of the subsystems
- Trouble-shooting guides for each of the subsystems
- System administration guides
- As-built plans/record drawings

#### **E. ITS Plans and Specifications**

The Design/Build Firm shall design plans and provide necessary documentation for the procurement and installation of the ITS. The Design/Build Firm shall submit 60 percent, 90 percent, and 100 percent (final) design plans and Technical Special Provisions to the Department for review and approval. The Design/Build Firm shall state the number of submittals and its contents in the Technical Proposal. The construction plan sheets identifying the final design shall include, but not be limited to:

- Title sheet
- Tabulation of Quantities
- General Notes
- Legend
- Pole Data Sheet
- Traffic Control Plans
- Project Layout / Overview sheets outlining the locations of ITS field elements
- Fiber optic communications and outside plant facilities and routing index sheets
- Plan sheets providing details on ITS field device locations and interface with the fiber optic communications cables, fiber optic cable routing and outside plant facilities including pull boxes, cabinets, fiber splice vaults, outlying structures and roadways, etc.,
- Roadway Cross-sections at ITS field locations
- Detail sheets on:
  - CCTV pole, lowering device, camera mounting
  - DMS structure, DMS attachment, DMS display/layout, DMS cross sections
  - Non-intrusive detection devices and mounting details
  - RWIS configuration and mounting
  - HAR configuration, mounting of transmitters, counterpoise layout
  - Emergency generator back-up system configuration

- Fiber optic splice and conduit
- Power service distribution
- Wiring and connection details for all ITS elements
- Conduit, pull box, splice vault and installation
- Equipment rack configuration at RTMC and STMC, communication hubs, and field cabinets
- System-level block diagrams
- Device-level block diagrams
- Field hub/router cabinet configuration details
- Video wall equipment configuration
- Fiber optic splicing diagrams
- System configuration/Wiring diagram/Equipment interface for the ITS field equipment – individual locations and communications hubs
- Tabulation of Equipment connection list
- Directional bores charts

The Design/Build Firm shall prepare, submit, and seek Department approval for all the required Plans, schematic diagrams, cabling/wiring diagrams, splice diagrams, and other pertinent information related to the equipment, materials and incidentals for the installation of cabinets, CCTV cameras, DMSs, non-intrusive vehicle detection, RWIS, communications network equipment, distribution conduit facilities, etc. prior to the commencement of the installation phase.

The Design/Build Firm shall prepare detailed Special Provisions that will expand on the Specifications as specified in the MTRs, as needed and identified during project design phase.

## **F. Roadway Plans**

### **General:**

The Design/Build Firm shall prepare the Roadway Plans Package. This work effort includes the roadway design and drainage analysis needed to prepare a complete set of Roadway Plans, Traffic Control Plans, Environmental Permits and other necessary documents.

### **Design Analysis:**

The Design/Build Firm shall develop and submit a signed and sealed Typical Section Package for review and concurrence by the Department and FHWA on Federal Aid Oversight Projects.

Any deviation from the Department's design criteria will require a design variation and any deviation from AASHTO will require a design exception. If a Design/Build Firm requests a variance or exception during the technical proposal phase, it must be discussed during the pre-bid meeting or prior to the information cut-off date. All such variances and exceptions must be approved or disapproved prior to the information cut-off date and such variances and exceptions will be disclosed to all the Design/Build Firms.

These packages shall include the following:

#### **1. Typical Section Package:**

- Transmittal letter
- Location Map

- Roadway Typical Section(s)
  1. Minimum milling depth
  2. Identify if ARMI layer is required
  3. Minimum lane, shoulder, median widths
  4. Slopes requirements
- Data Sheet
- Design Speed

**G. Geometric:**

The Design/Build Firm shall design the geometric for the project using the design standards that are most appropriate with proper consideration given to the design traffic volumes, adjacent land use, design consistency, aesthetics, ADA requirements, and this document.

The design elements shall include, but not be limited to, the horizontal and vertical alignments, lane widths, shoulder widths, median widths, cross slopes, borders, sight distance, side slopes, front slopes and ditches. The geometric design developed by the Design/Build Firm shall be an engineering solution that is not merely an adherence to the minimum AASHTO and/or Department standards.

**H. Design Documentation, Computations and Quantities**

The Design/Build Firm shall submit to the Department design notes and computations to document the design conclusions reached during the development of the construction plans.

The design notes and computation sheets shall be fully titled, numbered, dated, indexed, and signed by the designer and the checker. Computer output forms and other oversized sheets shall be folded to a standard size 8½" x 11". The data shall be in a hard-back folder for submittal to the Department. At the project completion, a final set of design notes and computations, signed by the Design/Build Firm, shall be submitted with the record set of plans and tracings.

The design notes and calculations shall include, but not be limited to, the following data:

1. Design standards used for the project
2. Geometric design calculations for horizontal alignments
3. Vertical geometry calculations
4. Documentation of decisions reached resulting from meetings, telephone conversations or site visits
5. Final quantities list

**I. Structure Plans**

Not Applicable to this Project – Please see Section VI, D for information regarding device support structures.

**J. Specifications:**

Department Specifications may not be modified or revised. The Design/Build Firm shall also include all Technical Special Provisions, which will apply to the work in the proposal. Technical Special Provisions shall be written only for items not addressed by Department Specifications, and shall not be used as a means of changing Department Specifications. This project is Federally Funded and all applicable Federal

Aid Specifications shall apply. This project shall also include SP 0081300, Damage Recovery, Partnering and Disputes Review Board.

Before construction activities can begin, the Design/Build Firm shall prepare and submit a signed and sealed Construction Specifications Package for the project, containing all applicable Division II and III Special Provisions and Supplement Specifications from the Specifications Workbook in effect at the time the Bid Price Proposals were due in the District Office. The Specifications Package shall be prepared by the individual(s) identified in the Technical Proposal as having successfully completed the mandatory Specifications Preparations Training.

The website for completing the training is at the following URL address:

<http://www2.dot.state.fl.us/SpecificationsEstimates/PackagePreparation/TrainingConsultants.aspx>

Specification Workbooks are posted on the Department's website at the following URL address:

<https://www2.dot.state.fl.us/SpecificationsPackage/Utilities/Membership/login.aspx?ReturnUrl=%2fspecificationspackage%2fDefault.aspx>.

The signed and sealed Specifications Package shall also include individually signed and sealed Technical Special Provisions for any and all work not addressed by Department Specifications. Any Technical Special Provisions included in the signed and sealed Construction Specifications Package which had not been included in the proposal phase, may require a contract cost modification as a condition of approval.

The Design/Build Firm must account for a fifteen (15) working day review time in its schedule. Upon review by the Department, the Construction Specifications Package will be stamped "Released for Construction" and initialed and dated by the reviewer.

Any subsequent modifications to the Construction Specifications Package shall be prepared, signed and sealed as a Supplemental Specifications Package, subject to the same process for submittal, review, and, release for construction, as described above, for the original Construction Specifications Package. Construction work affected by Supplemental Specifications Packages shall not begin until stamped "Released for Construction" Supplemental Specification Package is obtained.

#### **K. Shop Drawings**

The Design/Build Firm shall be responsible for the preparation and approval of all Shop Drawings. Shop Drawings shall be submitted to the Department and shall bear the stamp and signature of the Design/Build Firm's Engineer of Record (EOR) and the Design Build Firm's Contractor, and Specialty Engineer, as appropriate. The Department shall review the Shop Drawing(s) to evaluate compliance with project requirements and provide any findings to the Design/Build Firm. The Departments procedural review of shop drawings is to assure that the Design/Build Firm and the EOR have both accepted and signed the drawing, the drawing has been independently reviewed and is in general conformance with the plans. The Departments review is not meant to be a complete and detailed review. Upon review of the shop drawing, the Department will stamp "Released for Construction" or "Released for Construction as noted" and initialed and dated by the Department Design Build project administrator or his/her designee.

Shop Drawing submittals must be accompanied by sufficient information for adjoining components or areas of work to allow for proper evaluation of the Shop Drawing(s) submitted for review.

#### **L. Sequence of Construction**

The Design/Build Firm shall construct the work in a logical manner and with the following objectives as guides:

1. Maintain or improve, to the maximum extent possible, the quality of existing traffic operations, both in terms of flow rate and safety, throughout the duration of the project.
2. Minimize the number of different Traffic Control Plan (TCP) phases, i.e., number of different diversions and detours for a given traffic movement.
3. Take advantage of newly constructed portions of the permanent facility as soon as possible when it is in the best interest of traffic operations and construction activity.
4. Maintain reasonable direct access to adjacent properties at all times, with the exception in areas of limited access right-of-way where direct access is not permitted.
5. Proper coordination with adjacent construction projects and maintaining agencies.

#### **M. Stormwater Pollution Prevention Plans (SWPPP)**

The Design/Build Firm shall prepare an erosion control plan that complies with the SWPPP as required by the National Pollution Discharge Elimination System (NPDES). The Design/Build Firm shall refer to the PPM for information in regard to the SWPPP and Florida Department of Environmental Protection (FDEP) Rule 62-25 for requirements on the erosion control plan. Detailed limits of the erosion control items will be necessary but may be shown on the roadway plans sheets. This plan shall be submitted along with the Design/Build Firm's Certification at least fifteen (15) working days prior to beginning construction activities.

#### **N. Temporary Traffic Control Plan**

##### **1. Traffic Control Analysis**

The Design/Build Firm shall design a safe and effective Temporary Traffic Control Plan to move vehicular traffic during all phases of construction. The areas shall include, but are not limited to, construction phasing, utility relocation, drainage structures, signalization, ditches, front slopes, back slopes, drop offs within clear zone, and traffic monitoring sites. Special consideration shall be given to the drainage system when developing the construction phases. Positive drainage must be maintained at all times.

The Temporary Traffic Control Plan shall address how to assist with maintenance of traffic throughout the duration of the contract.

The Temporary Traffic Control Plan shall be prepared by a certified designer who has completed the Department's training course, and in accordance with the Department's Design Standards and the Roadway PPM.

Transportation Management Plans (TMPs) are required for significant projects, defined as:

1. A project that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts.

2. All Interstate system projects within the boundaries of a designated Transportation Management Area (TMA) that occupy a location for more than three days with either intermittent or continuous lane closures shall be considered as significant projects.

For significant projects, a TMP will consist of three components:

- (1) Temporary Traffic Control (TTC) plan component;
- (2) Transportation Operations (TO) component; and
- (3) Public Information (PI) component

Additional information is located in Chapter 10 of the PPM.

## **2. Temporary Traffic Control Plans**

The Design/Build Firm shall utilize Index Series 600 of the Department's Design Standards where applicable. Should these standards be inadequate, a detailed Temporary Traffic Control Plan shall be developed. The Design/Build Firm shall prepare plan sheets, notes, and details to include the following: typical section sheet(s), general notes and construction sequence sheet(s), typical detail sheet(s), and traffic control plan sheet(s).

The Design/Build Firm shall prepare additional plan sheets such as cross sections, profiles, drainage structures, retaining wall details, and sheet piling as necessary for proper construction and implementation of the Temporary Traffic Control Plan.

## **3. Traffic Control Restrictions**

NO LANE CLOSURE SHALL OCCUR UNLESS ALL VIABLE ALTERNATIVES HAVE BEEN EXPLORED AND REASONS FOR THE CLOSURE ARE WARRANTED, JUSTIFIED AND DOCUMENTED. LANE CLOSURES MUST BE APPROVED IN ADVANCE BY THE DEPARTMENT, WHEN ABOVE CONDITIONS ARE MET.

- Allowable lane closure time for all activities authorized by a Florida Department of Transportation (referenced as "Department" from this point) permit will be specified by the department, on the permit.
- Allowable lane closure time in a Department project will be specified in the Maintenance of Traffic Plans.
- A MINIMUM OF TWO WEEK ADVANCE notification of any proposed lane closure exceeding two hours must be provided to the CEI, SWIFT Center (239) 225-9860 , district public information office and law enforcement/fire/EMS.
- Contractors must provide notification to law enforcement agencies, local fire departments and emergency medical services for all lane closures and ramp closures.
- All lane closure requests must include consideration for special events such as major community events, sporting events and concerts.

- Final approval of lane closure restrictions will be provided by the local Operations Center Engineer with concurrence from either the District Maintenance Administrator or the District Construction Engineer
- The Department reserves the right to modify previously approved or specified times of closures when, in the opinion of the Engineer, it becomes necessary to do so.
- The allowable time periods for one lane per direction lane closures along I-75 in Sarasota and Manatee Counties are between the hours of 9:00 PM and 5:00 AM.
- The allowable time periods for two lanes per direction along I-75 in Sarasota and Manatee Counties lane closures are as follow:
  - South of SR 681 – Not Allowed
  - SR 681 to University Pkwy – 11:00 PM to 4:00 AM
  - University Pkwy to US 301 – 11:00 PM to 5:00 AM
  - North of US 301 – 10:00 PM to 5:00 AM
- Lane closures for I-75 ramps will be limited to 11:00 PM to 5:00 AM.
- Work activities with lane closures will be monitored. If, in the opinion of the Engineer, the lane closure is creating undo traffic delay and congestion, he/she may suspend the work and/or modify the lane closure time.
- Lane closures and restrictions for the crossroad structures and approaches shall be coordinated with the maintaining agencies and approved by the Department. The Design/Build Firm shall obtain a written agreement with the maintaining agency for any lane closures, restrictions or detours.
- Special requests deviating from the referenced time periods must be approved by the Director of Transportation Operations or his designee.

A damage recovery/user cost will be assessed against the Design/Build Firm if all lanes are not open to traffic by the end of the allowable time periods for lane closures as described above.

At the discretion of the Department's Project Representative, damage recovery/user cost shall not be assessed for failure to open lanes if such cause is beyond the control of the Design/Build Firm, i.e., catastrophic events or accidents not related to or caused by the Design/Build Firm's operations. The Department shall have the right to apply as payment on such damages any money that is due to the Design/Build Firm by the Department.

The Design/Build Firm shall coordinate lane closures with all local agencies to avoid conflict with special events.

**O. Environmental Services/Permits/Mitigation**

Permits are anticipated for this project from the following agencies:

- Southwest Florida Water Management District (SWFWMD)
- U.S. Army Corps of Engineers (USACE)
- Florida Fish and Wildlife Commission (FWC)

- U.S. Environmental Protection Agency (EPA)

The Design/Build Firm will be responsible for preparing designs and proposing construction methods that are permissible. The Design/Build Firm will be responsible for any required permit fees. All permits required for a particular construction activity will be acquired prior to commencing the particular construction activity. Delays due to incomplete permit packages, agency rejection, agency denials, agency processing time, or any permit violations, except as provided in Section V.D.2, will be the responsibility of the Design/Build Firm, and will not be considered sufficient reason for time extension.

Unless specifically identified otherwise, the design and construction of any alternate design approach identified within this RFP is not a requirement of this RFP. The Design/Build Firm is not responsible for any permitting or commenting agency coordination or other impacts to the permit processes that would be associated with any alternate design approach, unless the Design/Build Firm chooses to include the alternate design approach in its Proposal.

**P. Signing and Pavement Marking Plans**

The Design/Build Firm shall prepare signing and pavement marking plans in accordance with Department criteria.

**Q. Lighting Plans (Not Applicable to this Project)**

**VII. Technical Proposal Requirements.**

**A. General**

Each Design/Build Firm under consideration for this project is required to submit a Technical Proposal. The proposal shall include sufficient information to enable the Department to evaluate the capability of the Design/Build Firm to provide the desired services. The data shall be significant to the project and shall be innovative, when appropriate, and practical. Discussions of past performances on other projects shall be minimized except as they relate to the proposed work.

**B. Submittal Requirements**

The Technical Proposal shall be submitted in ACCO binders with identifying labels and with tabs labeled Section 1 through Section 9 with the information, paper size, and page limitation requirements as listed below.

A copy of the "Written Technical Proposal" must also be submitted in electronic format on a CD. The format shall be in Microsoft Word converted into a searchable PDF. format. No macros will be allowed. Minimum font size of 10.

Design/Build Firms are required to submit one (1) original bound copy containing original signatures. Please mark this copy "Original" on the front cover. In addition, submit five (5) independently bound copies of the Technical Proposal. The cover of the submittal package of the Technical Proposal shall contain the following information:

TECHNICAL PROPOSAL  
SARASOTA/MANATEE COUNTIES I-75 FMS Design/Build Project  
FPID: 414730-1-52-01/414732-1-52-01/414736-1-52-01  
Design/Build Firm's Name:  
Design/Build Firm's Address:

Submit three CDs of the Technical Proposal in its entirety and six hard copies (one original and five copies) of the Technical Proposal to:

Mr. Ed McKinney  
Professional Services Unit Administrator  
801 North Broadway Avenue  
Bartow, FL 33830  
**ATTN: Felipe Alvarez, MS 1-67**

Section 1: Written Technical Proposal

- Paper size: 8½" x 11", additional larger charts and graphs may be provided if folded neatly to 8½" x 11"
- Maximum allowed pages: 40

The minimum information to be included:

- **Approach and Understanding of the Project :**

The Design/Build Firm shall present a comprehensive plan for completing the specified work. The plan should address all significant design and construction issues and constraints and should demonstrate efficient use of manpower, materials, equipment, construction schemes, and techniques for completing the project.

- **Organization and Staffing Plan :**

The Design/Build Firm shall submit a staffing plan clearly illustrating the key elements of the organizational structure proposed to accomplish the management, technical, construction, and administrative services required. Project management and key personnel within each area of required services shall be identified and past experience of each, as it relates to this project, shall be discussed. The Department must approve any changes to the Project Management and Key Personnel. Other items to be included in the discussion of the staffing plan are:

1. Man-loading requirements (both quality and quantity) for all technical services.
2. Man-loading capabilities of all team firms.
3. Man-loading availability for the project.

- **Responsible Office :**

Design/Build Firms considered for this project may have more than one office location. Identify the office assigned responsibility for the work in the Technical Proposal. If proposing to complete different elements of the work at different locations, list those locations in the Technical Proposal.

- **Other Appropriate Data :**

Other data demonstrating the ability of the Design/Build Firm to provide the desired services may be included in the Technical Proposal.

- **Coordination :**

During the performance of the services, maintain coordination with the Department and/or other agencies. Address the suggested method for assuring proper coordination in the Technical Proposal.

- A summary of innovative aspects: Details can be explained in Section 4 4.
- A summary of Design/Build Firm's Value Added Features: The Design/Build Firm will summarize Value Added Features being proposed. Details of criteria will be provided in Section 6.
- A summary of Quality Management: The actual plan will be provided in Section 5.
- A summary of the project schedule: The full schedule will be provided in Section 3.

Section 2: Resumes of Key Project Personnel

- Paper size: 8½" x 11"
- Maximum allowed pages: Each Résumé is limited to one page per person.
- Minimum information to include: Key personnel experience directly related to this project.

Section 3: Proposed Schedule

- Paper size: 8½" x 11" or larger if folded neatly to 8½" x 11"
- Maximum allowed pages: 4
- Identify if the Schedule is based on Calendar or Working Days
- Minimum information to include in the summary CPM schedule of anticipated major milestones and their associated phasing as follows:

Anticipated Award Date  
Design Schedule  
Design Reviews by the Department  
Geotechnical Investigations  
Permitting  
Start of Construction  
Construction Milestones  
Construction Phasing and Major MOT shifts  
Utility Relocations  
Structure Completion Date  
Integration Schedule  
Acceptance Testing  
Burn-in Period  
Final Completion Date for all Work

Section 4: Innovative Aspects

- Paper size: 8½" x 11"
- Maximum allowed pages: 3
- Any supportive information associated with the proposed innovative aspects.

Section 5: Quality Management Plan

- Paper size: 8½" x 11"
- Maximum allowed pages: 5
- Minimum information to include shall be in accordance with Section V. N.

Section 6: Design/Build Firm Value Added

- Paper size: 8½" x 11"
- Maximum allowed pages: 5
- Minimum information to include shall be in accordance with Section V. T.

Section 7: Design Support Documents

- Paper size: 8½" x 11"
- Maximum allowed pages: As required
- Minimum information to include shall be in accordance with Section VI. F.

Section 8: Preliminary Plans

- Paper size: 11" x 17"
- Maximum allowed pages: As required

Minimum information to include in the preliminary design plans should represent a typical 30% plans submittal per the PPM and as detailed below:

ITS Devices

- Project Limits
- Proposed layout of the complete ITS network
- Proposed ITS device roadway placement
- Proposed DMS layout(s) with respect to travel lanes
- Proposed fiber network layout
- Interconnection with existing ITS networks
- Connections to existing roadway
- Attachments to existing bridges
- Utility provisions
- MOT provisions

Section 9: Specifications

Provide a list of individual members of the Design/Build Firm who have successfully completed the Specifications Package Preparation Training and will be responsible for preparing the Specifications Package for the project. The website for completing the training is:

<http://www2.dot.state.fl.us/SpecificationsEstimates/PackagePreparation/TrainingConsultants.aspx>

**C. Evaluation Criteria:**

The Technical Review Committee shall evaluate the written Technical Proposal by each Design/Build Firm. The Design/Build Firm should not discuss or reveal elements of the price proposal in the written proposals. The following criteria are the basis for the technical score for each firm:

<b>Item</b>	<b>Value</b>	<b>Value</b>
1.	Approach and Understanding of Project	20
2.	Organization and Staffing Plan	15
3.	Schedule	10
4.	Innovative Aspects	5
5.	Quality Management Plan	10
6.	Maintainability/Warranty/Value Added	15
7.	Proposed Materials	10
8.	Environmental Protection/Commitments	5
9.	Construction Methods	5
10.	Design	20
11.	Integration Services	25

**MAXIMUM SCORE 140**

The following is a description of each of the above referenced items:

**1. Approach and Understanding of Project (20 points)**

Credit shall be given for thorough understanding of the project and the Proposer's approach to the work.

**2. Organization and Staffing Plan (15 points)**

Credit shall be given for organization of the Proposer's team, including sub-contractors and sub-consultants for the staffing of the project, including the key staff's experience and skills relevant to the proposed assignments. Highlight team and individual SunGuide® integration experience in this section of the proposal.

**3. Schedule (10 points)**

Credit shall be given for a comprehensive and logical schedule that minimizes contract duration. Provide proper attention to the project's critical path elements.

**4. Innovative Aspects / Concepts (5 points)**

Credit shall be given for the innovative aspects proposed by the team both in the actual design and in how the project will be completed.

**5. Quality Management Plan (10 points)**

Credit shall be given for a timely, complete, and comprehensive QMP that incorporates effective peer reviews and includes all phases of the project.

6. **Maintainability/Warranty/Value Added (15 points)**

Credit shall be given for a design that minimizes periodic and routine maintenance. Consider the following elements: access to provide adequate inspections and maintenance, maintenance of surveillance systems/CCTV camera sites, access to ITS devices not requiring MOT, ITS device extended warranty periods, and quality of construction materials and products. Credit shall be assigned for exceeding minimum material requirements to enhance durability of structural components. Credit shall be given for the extent of the Value Added coverage.

7. **Proposed Materials (10 points)**

Credit shall be given for the proposed materials used that minimize impacts to the traveling public and the environment, reduce costs, improves worker safety, and minimizes contract duration. Credit shall be given for exceeding minimum material requirements to enhance durability of structural components.

8. **Environmental Protection/Commitments (5 points)**

Credit shall be given for minimizing impacts to the environment during all phases of design/construction and ensuring that all environmental commitments are honored.

9. **Construction Methods (5 points)**

Credit shall be given for construction methods that minimize impacts to the traveling public and the environment, reduce costs, improve worker safety, and minimize contract duration. Credit shall be given for exceeding minimum material requirements to enhance durability of structural components.

10. **Design (20 points)**

Credit shall be given for the demonstrated knowledge of the specific project integration needs. Credit shall be given for the quality of the following elements:

- Quality and quantity of design resources
- Design coordination and plans preparation schedule
- Construction coordination plan minimizing design changes
- Geotechnical investigation plan
- Structure design

11. **Integration Services (25 points)**

Credit shall be given for the demonstrated knowledge of the specific project integration needs. Credit shall be given for the quality and quantity of integration resources.

**D. Final Selection Formula**

The Selection Committee shall publicly open the sealed bid proposals and calculate an adjusted score using the following formula:

$$\frac{BPP}{TS} = \text{Adjusted Score}$$

BPP = Bid Price Proposal

TS = Technical Score

The firm selected will be that firm whose adjusted score is lowest.

The Department reserves the right to consider any proposal as non-responsive if any part of the Technical Proposal does not meet established codes and criteria. Also, if PCT is greater than **Maximum Allowable Contract Time (MCT) (760 Calendar Days)**, the proposal will be considered non-responsive.

#### **E. Final Selection Process**

After the sealed bids are received, the Department will have a public meeting for the announcement of the Technical Scores and opening of sealed bids. At this meeting, the Department will announce the score for each member of the Technical Review Committee for each Proposer and each Proposer's average Technical Score. Following announcement of the technical scores, the sealed bid proposals will be opened and the adjusted scores calculated. The Selection Committee should meet a minimum of five working days after the public opening of the Technical Scores and Price Proposals. The Department's Selection Committee will review the evaluation of the Technical Review Committee and the Price Proposal of each Proposer as to the apparent lowest adjusted score and make a final determination of the lowest adjusted score. The Selection Committee has the right to correct any errors in the evaluation and selection process that may have been made. The Department is not obligated to award the contract and the Selection Committee may decide to reject all proposals. If the Selection Committee decides not to reject all proposals, the contract will be awarded to the Proposer determined by the Selection Committee to have the lowest adjusted score.

#### **F. Stipend Awards**

The Department has elected to pay responsive shortlisted proposers who are not awarded the contract a stipend to offset some of the costs of preparing their proposals. That stipend will only be payable under the terms and conditions of the stipend agreement, a copy of which is included with this Request for Proposal. This Request for Proposal does not commit the Department or any other public agency to pay any costs incurred by an individual firm, partnership, or corporation in the submission of proposals except as set forth in the stipend agreement. The amount of the stipend compensation will be **\$50,000** and in no way is intended to compensate Firms for the total cost of preparing the Technical and Price Proposals. The Department reserves the right to use any of the concepts or ideas within the Technical Proposal, as the Department deems appropriate.

In order for a shortlisted firm to be eligible for a stipend, the shortlisted firm must execute with original signatures and have delivered to the Department no later than three weeks after Request for Proposal release, **three** originals of the Design/Build Stipend Agreement, Form No. 700-011-14. The Design/Build Firm shall reproduce the necessary copies. Terms of said agreement are non-negotiable. A fully executed copy of the agreement will be returned to the shortlisted firm.

Failure of a shortlisted firm to execute and timely return the agreement shall constitute a release to the Department by the shortlisted firm for proposal compensation and the Department shall have no further obligation to compensate the shortlisted firm for its efforts in preparing its proposal.

The shortlisted firms are to submit an invoice for payment of services on a lump sum basis after the selection/award process is complete. The invoice should include a statement similar to the following: "All work necessary to prepare technical and price proposals in response to the Department's RFP for the subject project". Compensation is intended to be on a pass/fail basis (i.e., responsive or non-responsive).

If a proposal is deemed to be non-responsive by the Technical Review Committee, no stipend will be paid.

**VIII. BID PROPOSAL REQUIREMENTS.**

**A. Bid Price Proposal**

Bid Price Proposals shall be submitted on the Bid Blank form attached hereto and shall include one lump sum price for the Project and the number of calendar days within which the Proposer will complete the project. The lump sum price shall include all costs for all design, geotechnical surveys, architectural services, engineering services, Design/Build Firms quality plan, construction of that portion of the Project, and all other work necessary to fully and timely complete that portion of the Project in accordance with the Contract Documents, as well as all job site and home office overhead, and profit, it being understood that payment of that amount for that portion of the Project will be full, complete, and final compensation for the work required to complete that portion of the Project. The Price Proposal shall be hand delivered in a separate sealed package to the following:

Mr. Ed McKinney  
Professional Services Unit Administrator  
801 North Broadway Avenue  
Bartow, FL 33830  
**ATTN: Felipe Alvarez, MS 1-67**

The package shall indicate clearly that it is the Price Proposal and shall identify clearly the Proposer's name and project description. The Bid Price Proposal shall be secured and unopened until the date specified for opening of Price Proposals.

**ATTACHMENT A**



**FLORIDA DEPARTMENT OF TRANSPORTATION  
DISTRICT ONE**

**DESIGN-BUILD  
MINIMUM TECHNICAL REQUIREMENTS**

**For**

**I-75 Corridor Freeway Management System and  
Intelligent Transportation Systems (ITS) Integration Project in  
Sarasota and Manatee Counties**

**Contract Number: E1J73**

**Financial Projects Number(s):**

**414730-1-52-01, 414732-1-52-01, & 414736-1-52-01**

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## ACRONYMS

AASHTO .....	American Association of State Highway and Transportation Officials
AC .....	Alternating Current
AGM .....	Absorbent Glass Mat
AM .....	Amplitude Modulation
APL .....	Approved Products List
ASTM .....	American Society for Testing and Materials
CCTV .....	Closed Circuit Television
CLD .....	Camera Lowering Device
COTS .....	Commercial Off The Shelf
DMS .....	Dynamic Message Sign
DVRMP .....	Distance Vector Multicast Routing Protocol
EIA .....	Electronic Industries Alliance
ERM .....	Electronic Route Marker
ESS .....	Environmental Sensor Station
FCC .....	Federal Communications Commission
FDOT .....	Florida Department of Transportation
FMS .....	Freeway Management System
GBIC .....	Gigabit Interface Converter
GFI .....	Ground Fault Interrupter
GFIC .....	Ground Fault Interrupter Circuit
GPS .....	Global Positioning System
GUI .....	Graphical User Interface
HAR .....	Highway Advisory Radio
IP .....	Internet Protocol
ISO .....	International Organization for Standardization
IT .....	Information Technology
ITS .....	Intelligent Transportation Systems
ITS FM Tool .....	ITS Fiber Management Tool
LED .....	Light Emitting Diode
MPEG .....	Moving Picture Experts Group
MTR .....	Minimum Technical Requirements
MVDS .....	Microwave Vehicle Detection System
NEC .....	National Electrical Code
NEMA .....	National Electrical Manufacturers Association
NCHRP .....	National Cooperative Highway Research Program
NTCIP .....	National Transportation Communications for ITS Protocol
OSPF .....	Open Shortest Path First
OTDR .....	Optical Time-Domain Reflectometer
PIM-DM .....	Protocol Independent Multicast-Dense Mode
PIM-SM .....	Protocol Independent Multicast- Sparse Mode
<i>PPM</i> .....	<i>FDOT Plans Preparation Manual</i>
PTZ .....	Pan-Tilt-Zoom
RFP .....	Request for Proposal
RPU .....	Remote Processing Unit
RTMC .....	Regional Transportation Management Center
RTVM .....	Requirements Traceability Verification Matrix
RWIS .....	Road Weather Information System

SFP	Small Form-Factor Pluggable
SNMP	Simple Network Management Protocol
SRM	Standard Route Marker
STMC	Satellite Transportation Management Center
STP	Shielded Twisted Pair
SWIFT	Southwest Interagency Facility for Transportation
TCP/IP	Transmission Control Protocol/Internet Protocol
TERL	Traffic Engineering Research Lab
TIA	Telecommunications Industry Association
TVSS	Transient Voltage Surge Suppressor
UL	Underwriters Laboratories
UPS	Uninterruptible Power Supply
UTP	Unshielded Twisted Pair
VAC	Volts Alternating Current
VDC	Volts Direct Current

## 1.0 INTRODUCTION

The Sarasota and Manatee I-75 Freeway Management System (FMS) Project is the next phase of the I-75 FMS which is a continuation of the existing Collier/Lee/Charlotte I-75 FMS. This project extends the FMS coverage from approximately one mile north of the Charlotte/DeSoto/Sarasota County line to the intersection of I-275 and I-75 in Manatee County. The Sarasota and Manatee I-75 FMS shall be integrated into the existing Southwest Interagency Facility for Transportation (SWIFT) SunGuide® Center located at the Daniels Parkway Rest Area off of I-75 in Fort Myers and the Sarasota-Manatee County Satellite Transportation Management Center (STMC) located at 2101 47<sup>th</sup> Terrace East, Bradenton. The following projects make up this contract:

- FPID 414730-1-52-01, I-75 in Sarasota County from Charlotte County Line to Manatee County Line, design and construct a FMS;
- FPID 414732-1-52-01, I-75 in Manatee County from Sarasota County line to I-275, design and construct a FMS; and
- FPID 414736-1-52-01, Integrate the FMS installed under FPID 414730-1-52-01 and 414732-1-52-01 with the Regional Transportation Management Center (RTMC) in Lee County and the Sarasota/Manatee STMC in Manatee County.

This Minimum Technical Requirements (MTR) document sets forth the minimum requirements for the design, procurement, installation, integration, and testing of the various project elements, including:

- Intelligent Transportation System (ITS) field elements:
  - Closed circuit television (CCTV) cameras
  - Non-intrusive Microwave Vehicle Detection System (MVDS)
  - Dynamic Message Signs (DMS)
  - Highway Advisory Radio (HAR) System
  - Road Weather Information System (RWIS)
  - Power & Emergency Generator System
- Fiber optic backbone cable and communications equipment that interfaces with the ITS field elements via the Ethernet communications protocol
- Transmit CCTV camera video back to the SWIFT SunGuide® Center using Moving Picture Experts Group (MPEG) 2 video compression format.
- Field device interconnection to and enhancements of the Sarasota-Manatee STMC.

Each of the aforementioned project ITS field elements shall be installed and seamlessly integrated with the existing Collier/Lee/Charlotte I-75 FMS. All integration, programming, and configuration of the individual subsystems or field components shall be considered as part of the subsystem or component installation.

The SunGuide Implementation Plan for FDOT Sarasota/Manatee County Satellite TMC Integration Project prepared by the Southwest Research Institute (SwRI) details the specific tasks that must be performed in connection with this project. The Design-Build Firm shall coordinate its activities with SwRI, including scheduling the activities that must be completed to permit SwRI to complete its tasks in a timely manner, so the Design-Build Firm can complete the project as scheduled. The Design-Build Firm shall utilize the information in the SunGuide Implementation Plan to finalize their design of the FMS and create their integration plan for approval by the Florida Department of Transportation (Department or FDOT). The SunGuide Implementation Plan details those tasks necessary to integrate the FMS as intended by the Department. SwRI is responsible for installing the SunGuide® software. The Design-Build Firm is responsible for all other integration related tasks as shown in the SunGuide Implementation Plan.

The Design-Build Firm shall provide Global Positioning System (GPS) coordinates for all pull boxes, splice boxes, conduit routing, and ITS field elements including power drops, devices and cabinets, to a

sub-foot level of accuracy. Convert these coordinates into State Plane format for ease of importing into Microstation plans. All aerials used as base maps shall be ortho-rectified and the GPS coordinates of the project elements shall be tied to the aerials on the final record set plans.

### **1.1 Requirements Classification**

The minimum requirements for some of the subsystems are further defined as:

- Design Requirements – How the subsystem/component needs to be designed
- Functional Requirements – How the subsystem/component needs to function
- Performance Requirements – How the subsystem/component needs to perform
- Materials Requirements – How the subsystem/component needs to be fabricated
- Construction Requirements – How the subsystem/component needs to be constructed

Specific requirements for testing a particular subsystem/component and training of operations/maintenance personnel are defined under the individual subsystem/component sections in this document. The general requirements for testing and training relevant for all the subsystems/components are further defined below.

### **1.2 General Testing Requirements**

The Department shall provide the Design-Build Firm with a Requirements Traceability Verification Matrix (RTVM) that calls out all contract requirements and the method of verification: analysis, demonstration, inspection or testing. The Design-Build Firm is responsible for all contract requirements and shall document the verification as the contract requirements are met.

The Design-Build Firm shall develop as part of the Test Plan Submittal and subsequent updates thereof, a Test Evaluation Matrix to be used as a tool to cross-reference each planned test to a specific contract requirement to be verified as shown in the RTVM. The Design-Build Firm shall use this Test Evaluation Matrix shall to indicate the specific functional requirements as tested and the results achieved and verified by the Engineer. This shall provide a mechanism to ensure that all contract requirements have been successfully tested and verified.

The Design-Build Firm shall develop a comprehensive test plan, submit it for approval by the Engineer, incorporate all of the Engineer's comments, execute the plan, and document the results. All Test Plans as defined below shall be submitted for review and acceptance by the Department at least 90 calendar days prior to any planned test activity. Any deviations or changes to the approved Test Plan shall be resubmitted for review and acceptance by the Department 14 calendar days prior to any planned test activity.

As a minimum, the Test Plan shall include the following:

- A step-by-step outline of the test procedures and sequence to be followed, showing a test of every function for each of the individual subsystems/components.
- A test set-up/configuration diagram showing what is being tested.
- A description of expected operation, output, and test results.
- An estimate of the test duration and proposed test schedule.
- A data form to be used to record all data and quantitative results obtained during the tests.
- A description of any special equipment, setup, manpower, or conditions required for the test.

The Design-Build Firm shall not begin testing until the Department has approved the Test Plan and Test Evaluation Matrix, including detailed procedures and data forms. The test results for each subsystem/component tested shall meet the performance requirements identified for the particular subsystem/component defined in Florida Standard Specifications for Road and Bridge Construction,

current edition, Supplemental Specifications sections 780, ITS General-Requirements; 781, ITS-Motorist Information Systems; 782, ITS-Video Equipment; 783, ITS-Fiber Optic Cable and Interconnect; 784, ITS-Network Device; 785, ITS-Infrastructure; and 786, ITS-Vehicle Detection and Data Collection, as well as the requirements defined in this MTR for each subsystem/component.

Neither witnessing of the tests by the Department nor the waiving of the right to do so shall relieve the Design-Build Firm of the responsibility to comply with the contract documents. Such actions by the Department or approval of any test results by the Department shall not be deemed as acceptance of the equipment or system tested until the successful completion of the burn-in period, as defined in the Request for Proposal (RFP). The cost of testing shall be considered to be included in the unit cost for the item tested; no separate payment will be made for testing.

Testing of the equipment and system shall include, in the following order, each preceding test must be satisfactorily completed and accepted before subsequent test(s) may begin:

#### **1.2.1 Factory Acceptance Test**

All applicable Factory Acceptance Tests shall comply with the test requirements of the relevant sections of FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786.

#### **1.2.2 Stand-alone Test**

All applicable Stand-alone Tests shall comply with the test requirements of the relevant sections of FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786.

The Stand-alone Test shall exercise all stand-alone (non-network) functional operations of the ITS device and ancillary components installed at the device site.

If any ITS device or ancillary component fails to pass its Stand-alone Test more than twice, it shall be replaced by the Design-Build Firm with a new ITS device or ancillary component of same make and model, and the entire Stand-alone Test shall be repeated until proven successful. The Stand-alone Tests shall be performed on each and every ITS device and ancillary component, including, but not limited to the following:

- CCTV Cameras
- Non-intrusive MVDS
- DMS
- HAR
- RWIS
- Device controllers
- Video controllers
- Layer 3 distribution switches
- Managed field Ethernet switches
- Fiber optic cable
- Uninterruptible Power Supplies (UPS)
- Grounding-bonding
- Emergency generators

#### **1.2.3 Subsystem Test**

All applicable Subsystem Tests shall comply with the test requirements of the relevant sections of FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786.

Tests shall be performed based on the construction project milestones. The subsystem/component test shall demonstrate that all equipment furnished, adjusted, or modified by the Design-Build Firm has been installed properly and operates according to the Department-approved Test Plan. The Design-Build Firm

shall conduct the subsystem/component test in the presence of the Department's Project Manager or designated representative. The subsystem/component test will begin within seven days after the Design-Build Firm advises the Department's Project Manager that they are ready to begin the test. The test may begin when the Design-Build Firm has satisfied the Department that all work has been completed. The subsystem test shall verify that all of the requirements defined in the MTR for the subsystem/component being tested have been met. This test shall be performed utilizing the project field equipment and communications system. The test shall demonstrate full control of the field device(s) from the Sarasota-Manatee STMC over the Ethernet Network, as well as the functions of local/remote troubleshooting/diagnostics specified in the equipment's functional requirements. The test shall be conducted with manufacturer-supplied software. The Design-Build Firm shall provide qualified personnel to support the diagnosis and repair of system equipment during the subsystem test as required. These personnel shall be available for this support within 24 hours of notification that their services are needed.

In the event the subsystem fails the test or is rejected by the Department, the Design-Build Firm shall correct the problem and repeat the test within seven days after receiving the rejection notice from the Department. The test shall be re-conducted until the Department accepts the test result.

The Design-Build Firm shall furnish and maintain all required test equipment as part of their services. The test equipment – both hardware and software – shall be the property of the Department after the completion of the test.

All test equipment utilized shall have a calibration certification in accordance with the test set manufacturer's recommendations or within the last six months.

The test equipment shall be made ready for the Department's use at the time it is needed.

If requested by the Department, the Design-Build Firm shall postpone any test for up to seven days; such postponements shall not be grounds for extension of completion time. The Department may waive its right to witness certain tests.

#### **1.2.4 Operational Test**

The Design-Build Firm shall plan, implement and document the Operational Test. The test shall demonstrate successful installation of all Sarasota and Manatee I-75 FMS subsystems, properly integrated with the SunGuide® software and operable from both the SWIFT SunGuide® Center and the Sarasota-Manatee STMC, operating continuously for a period of 30 consecutive calendar-days without failure of any subsystem, ITS device, or ancillary component. This Operational Test of the complete Sarasota and Manatee I-75 FMS is an additional test to all other tests required in the relevant sections of FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, 786, and this MTR document.

The Operational Test shall commence upon successful completion of all other applicable tests required in the relevant sections of FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, 786, and this MTR document.

The Design-Build Firm shall notify the Department in writing of the scheduled date of the Operational Test 14 calendar-days prior to the commencement of said Operational Test. No Operational Testing shall be performed without prior written approval from the Department.

In the event of a subsystem, ITS device, or ancillary component failure, with the exception of consumable items such as fuses, the Operational Test shall be shut down for purposes of testing and correcting identified deficiencies, otherwise known as System Shutdown. System Shutdown is defined as any condition which, due to manufacturer defect or workmanship deficiencies results in any subsystem, ITS

device, or ancillary component of the Sarasota and Manatee I-75 FMS Project to cease operation or lose functionality. The Department reserves the right to determine that a System Shutdown is required.

For each period of System Shutdown, and after the identified deficiency has been corrected and met all applicable tests as per this MTR, the Operational Test shall be restarted for a new 30 consecutive calendar days and shall be extended for one additional consecutive day.

If the total number of System Shutdowns exceeds three due to the same subsystem, ITS device, or ancillary component, the Design-Build Firm shall:

- Remove and replace the subsystem, ITS device or ancillary component with a new and unused unit as per the requirements of this MTR;
- Perform all applicable Stand-alone and Subsystem Tests, as deemed necessary by the Department; and
- Upon written approval from the Department, restart the Operational Test for a new 30-day period.

The Operational Test steps described herein shall be repeated as many times as deemed necessary by the Department to completely demonstrate that the Design-Build Firm's work satisfies the requirements of this MTR and all other requirements of the Contract.

In the event a problem is discovered for which it is uncertain whether the cause is hardware or software related, the 30 calendar-day Operational Test shall be stopped in order to determine and correct the cause before the restart and repeat of the Operational Test, unless otherwise directed by the Department. However, the Operational Test shall not be deemed to have been successfully completed until the problem has been corrected.

All software required for diagnosing malfunctions of hardware and software/firmware shall be supplied by the Design-Build Firm. Diagnostic software shall not be installed on Department workstations or servers at the SWIFT Center. The Design-Build Firm will not be required to submit the diagnostic software for Department approval.

### **1.2.5 Burn-In Period**

Upon completion of the Operational Test and approval of the results by the Department, a 60 consecutive calendar-day Burn-In Period shall commence for all subsystems, ITS devices and ancillary components designed, procured, constructed, installed, mounted, integrated, made operational, and tested as part of the Sarasota and Manatee I-75 FMS Project.

The Design-Build Firm shall submit, via a schedule, the start of the Burn-In Period to be approved by the Department.

The Design-Build Firm shall certify in writing to the Department the configuration of all subsystems, ITS devices, and ancillary components prior to beginning the Burn-In Period. Corrective action by the Design-Build Firm for a failure shall be a part of the Design-Build Firm's Burn-In documentation process. Department approval shall be obtained by the Design-Build Firm for the proposed corrective action prior to the Design-Build Firm's commencement of said corrective action.

The Design-Build Firm shall submit to the Department the required documentation to prove that all units have been successfully reconfigured or updated.

The Design-Build Firm shall provide technical personnel familiar with the Sarasota and Manatee I-75 FMS Project that shall be available on-site within 24 hours of notification of the need for services.

The Burn-In Period shall consist of the Department operations staff managing, monitoring, and controlling the Sarasota and Manatee I-75 FMS Project from the SWIFT Center and the Sarasota-Manatee

STMC, in real-time, to assure conformance of the project with the RFP, the MTR, the Released for Construction plans, and all applicable standards.

The Design-Build Firm shall repair or replace any subsystem, ITS device, or ancillary component that fails to function properly due to defective materials and/or workmanship.

In the event of a subsystem, ITS device, or ancillary component failure, with the exception of consumable items such as fuses, the Burn-In Period shall be shut down for purposes of testing and correcting identified deficiencies otherwise known as System Shutdown. System Shutdown is defined as any condition, which due to manufacturer defect or workmanship deficiencies results in any subsystem, ITS device or ancillary component of the Sarasota and Manatee I-75 FMS Project to cease operation or lose functionality. The Department reserves the right to determine that a System Shutdown is required.

For each period of System Shutdown, and after the identified deficiency has been corrected and met all applicable tests as per this MTR, the Burn-In Period shall be restarted for a new 60 consecutive calendar-days.

If the total number of System Shutdowns exceeds three due to the same subsystem, ITS device, or ancillary component, the Design-Build Firm shall:

- Remove and replace the subsystem, ITS device or ancillary component with a new and unused unit as per the requirements of this MTR;
- Perform all applicable Stand-alone, Subsystem, and Operational Tests, as deemed necessary by the Department; and
- Upon written approval from the Department, restart the Burn-In Period for a new 60-day period.

The Burn-In Period steps described herein shall be repeated as many times as deemed necessary by the Department to completely demonstrate that the Design-Build Firm's work satisfies the requirements of this MTR and all other requirements of the Contract.

The Design-Build Firm shall correct any and all failures during the Burn-In Period at no additional cost to the Department. All corrections shall be fully documented and provided to the Department upon request.

#### **1.2.6 Final Acceptance**

Upon the Design-Build Firm's successful completion of the Burn-In Period and once all required submittals, testing, training, documentation, and warranty documentation have been successfully delivered to and approved by the Department as specified in these MTRs, the RFP, and the requirements of the FDOT Standard and Supplemental Specifications (current edition) and all applicable standards, the Department shall grant written notice of Final Acceptance.

The Department shall issue Final Acceptance based on the Department's final inspection of the entire Sarasota and Manatee I-75 FMS Project, and as deemed by the Department.

All hardware and software provided by the Design-Build Firm shall have the latest stable firmware and any necessary upgrades available at the time of Final Acceptance.

All As-Built documents shall be produced electronically using MicroStation software, signed and sealed by the Engineer of Record, and submitted by the Design-Build Firm to the Department as a condition precedent to issuance of written notice of Final Acceptance. The As-Built documents shall be submitted for Department review at the start of and as a prerequisite to the 30 day Operational Test.

The Department shall perform the final inspections of the entire Sarasota and Manatee I-75 FMS Project in the presence of a representative of the Design-Build Firm.

### 1.3 SunGuide® Software Compatibility

The Department operates the Collier/Lee/Charlotte I-75 FMS field devices from the SWIFT Center using the SunGuide® Software System. The Design-Build Firm shall integrate the Sarasota and Manatee I-75 individual ITS field elements (i.e., CCTV cameras, MPEG-2 Encoders, DMSs, MVDSs, Serial and Ethernet communication devices, HAR Transmitters and Beacons, and RWIS stations) with the respective vendor-provided subsystem software such that each of the subsystems will be operated as a stand-alone system. After the completion and acceptance of the individual ITS subsystems, the Design-Build Firm shall integrate the ITS subsystems with the existing SunGuide® central software installation at the SWIFT Center and the new SunGuide® software installation at the Sarasota-Manatee STMC.

The Design-Build Firm shall procure all licenses for the Oracle software in the Department's name. The Department anticipates that the Design-Build Firm shall purchase four Oracle licenses for the Microsoft Clustering Group at the STMC; however, the Design-Build Firm is responsible for determining the correct number of licenses. The Design/Build Firm shall purchase any necessary renewals for the Oracle licenses to extend the expiration date through one year after Final Acceptance.

The Design-Build Firm shall provide all the temporary central equipment, including the workstations or laptop computers, necessary for the testing of the individual subsystems.

Prior to the final acceptance, the Design-Build Firm shall demonstrate to the Department that all of the equipment specified in these MTRs that were installed and configured by the Design-Build Firm flawlessly operates from any SunGuide® client workstation located at the SWIFT Center and the new Design-Build Firm supplied SunGuide® client workstations at the Sarasota-Manatee STMC.

The integration of the various subsystems with the SunGuide® software is the responsibility of the Design-Build Firm. The Design-Build Firm shall coordinate with the SWIFT Center Information Technology (IT) Manager to provide the following services:

- Conduct a site survey to prepare the creation of the system database, configuration files, system graphics, and other preparatory work for the integration of the new devices into the SunGuide® software.
- Troubleshoot any Design-Build Firm-installed hardware issues (both field and central) that affect the integration work.
- Install the hardware and software required to operate the SunGuide® software compatible with current Windows 7 server or as approved by the Department.
- Provide ITS field device information, such as equipment configuration diagrams, Internet Protocol (IP) addresses, protocols, and documentation (e.g., users' manual, troubleshooting guide, ITS Fiber Management Tool forms, etc.).
- Configure the ITS field devices for integration with the SunGuide® software, including link, lane, roadway, and device configurations.
- Provide post-installation services after testing the SunGuide® software. The services shall include populating the tables and creating map links.

All the licenses for the above products shall be transferred to the Department. The installation media for the above products shall be provided and shall become the property of the Department after installation.

#### 1.3.1 Device Protocol Compliance

For the devices being deployed, the Design-Build Firm shall ensure that the protocol used by the devices to be controlled by the SunGuide® software is compliant with the protocols listed below, which are online at <http://sunguide.datasys.swri.edu/ReadingRoom/Etc/SunGuide%20Protocol%20Support.htm>

**Table 1.1: Device Protocols Supported by SunGuide®**

Subsystem	Protocol Reference	Release	Original ITN	Added in ECO	Vendor Funded Testing
DMS	NTCIP 1203, FDOT MIB (Sep 2001)	1	X		
DMS	Mark IV - I95: Document Number A316111-102 REV. A8 (June 26, 2001)	1	X		
DMS	Mark IV - Turnpike: Document Number A316111-145 Rev.A2 (Sept 26, 2000)	4.3		X	
DMS	SunGuide Trailblazer - Kimley-Horn, 2000	2		X	
CCTV Control	NTCIP 1205 v01.08 Amendment 1 v01.08 (August 2004)	1	X		
CCTV Control	American Dynamics SD Ultra VII camera firmware version 2.03, dated January 24, 2006	3		X	
CCTV Control	American Dynamics SD Ultra 8 camera firmware version 1.09, FPGA version 2006/10/31 15:18	3		X	
Video Switching: IP Video	VBrick 4200/5200	1		X	
Video Switching: IP Video	Teleste IPE301 and IPD301	1		X	
Video Switching: IP Video	Coretec VCX2400D/VCX2400E	1		X	
Video Switching: IP Video	iMpath i1000/i4100	1		X	
Video Switching: IP Video	Cornet Technology iVDO Streamer 2/4D / iVDO Streamer 2/4E	1			X
Video Switching: IP Video	Teleste MPC-E1, MPC-D2, EASI-MPC-D (1, 2, and 4 channel), EASI-MPX-D (8 channel), EASI-MPC-E (1, 2, and 4 channel)	4.3		X	
Video Wall	Barco/Argus Apollo, API ver 1.8	1		X	
Safety Barrier	Safety Barrier Device Protocol	2		X	
Traffic Detection	BiTrans B238-I4	1	X		
Traffic Detection	EIS RTMS, Issue 2 (April 2003)	2		X	
Traffic Detection	Wavetronix RTMS: SS105 SmartSensor Data Protocol V2.02	2		X	
Traffic Detection	Canoga Microloops, TM-2003-8 (June 2003)	2		X	

Subsystem	Protocol Reference	Release	Original ITN	Added in ECO	Vendor Funded Testing
Traffic Detection (AVI)	SIRIT Identity Flex Title 21 SIRIT5000FSD (Revision E 2003)	4		X	
Traffic Detection (AVI)	lTransCore Allegro IT2020	4		X	
Traffic Detection (LPR)	Inex Zamir Zap (2008)	4		X	
HAR	Highway Information Systems DR2000	2	X		
Ramp Meters	FDOT Ramp Metering Firmware V1	2		X	
RWIS	NTCIP 1204 v02.18 (April 2004)	2	X		

The Design-Build Firm may propose alternate ITS equipment; however, the Design-Build Firm shall be responsible for developing the drivers for these devices or other necessary software revisions for integration into the SunGuide® Software. The drivers for any devices shall conform to the latest SunGuide® Interface Control Document available at <http://sunguide.datasys.swri.edu/> to ensure compatibility for integration with the SunGuide® Software. The Design-Build Firm shall coordinate with the Central Office and the SunGuide® Software Developer in developing and testing the device drivers.

### 1.3.2 Network Infrastructure

The SunGuide® network infrastructure, SunGuide® servers and SunGuide® clients shall already have been installed, tested, and accepted at the SWIFT Center by FDOT District 1 as the result of the Collier/Lee/Charlotte I-75 FMS projects. The Design-Build Firm is responsible for the new SunGuide® network infrastructure, SunGuide® servers and SunGuide® clients (including 11 workstations) at the Sarasota-Manatee STMC.

The SWIFT Center IT Manager has recently implemented a Microsoft Clustering environment at the SWIFT Center to provide full redundant network services for the existing ITS devices in Collier, Lee and Charlotte Counties. The Design-Build Firm is responsible for coordinating with the SWIFT Center IT staff to implement a similar Microsoft Clustering environment at the Sarasota-Manatee STMC.

The IP address range that includes the unicast and multicast addresses have already been allocated for the District 1 ITS network. The IP addresses will be provided to the Design-Build Firm by the Department. The Design-Build Firm Integrator shall meet with the SWIFT Center Manager and SWIFT Center IT Manager prior to any work being done within the SWIFT Center or Sarasota-Manatee STMC. This Pre-Integration Meeting is to discuss any issues, concerns, and the Design-Build Firm's plan to minimize the impact to the existing ITS at the SWIFT Center.

The Design-Build Firm shall develop an integration plan to include that details all equipment, software and scheduling to occur during the integration portion of the project. The Design-Build Firm shall submit the preliminary integration plan 30 days prior to the Pre-Integratoin meeting. The plan shall be finalized after the meeting and again submitted to the Department for review and approval.

### 1.3.3 Device Worksheets

The Design-Build Firm shall coordinate with the SWIFT Center IT Manager and the Department to collect and provide the required information about each device to be utilized by the SunGuide® software. Examples of information for CCTV cameras and DMS components are identified below. Other devices

require similar information be provided. The Design-Build Firm shall coordinate with the Southwest Research Institute (SwRI) for the exact information to provide for these devices. This information shall be included in/on the Design-Build Firm's 100% plans submittal.

These device worksheets will be used as tracking sheets for the ITS devices installed as part of the Sarasota and Manatee I-75 FMS project. The Design-Build Firm, CEI, Department personnel and the SWIFT Center IT Manager will participate in a Pre-Integration Meeting to discuss the expectations of all parties during the Integration portion of the project.

The Design-Build Firm shall coordinate with the SWIFT Center Manager and SWIFT Center IT Manager prior to the 100% plan stage so that the device naming convention and sequence numbers are implemented in that submission.

The Design-Build Firm shall provide the following data for each CCTV camera to be configured:

**Table 1.2: CCTV Camera Data Configuration Documentation Requirements**

<b>Data</b>	<b>Description</b>
Camera Name	The data identifies the unique name of each camera.
Center ID	The data identifies the unique name of the center where each camera resides.
Protocol	The data specifies the protocol (values: SNMP, SNMP(PMPP)) for each camera.
Poll Process	The data provides the name of the driver for each camera.
Manufacturer	The data identifies the manufacturer of each camera.
Location Description	The data describes where each camera resides.
Roadway	The data identifies the roadway where each camera resides.
Direction	The data identifies the direction of the roadway where each camera is installed.
Latitude	The data identifies the latitude where each camera resides.
Longitude	The data identifies the longitude where each camera resides.
Op Status	The data identifies the operational status (values: Active, Error, Failed, OutOfService) of each camera.
Address Type1	The data identifies the address type (values: pmppAddress, commAddress) for each camera. (If pmppAddress, then the camera uses SNMP (PMPP); if commAddress, then the camera uses SNMP.)
Address Type2	The data specifies the address type (value: portServerAddress) of Address Type 1.
Address	The data identifies the device address of each camera.
Port Server IP	The data identifies the IP address for the port server where each camera resides.
Port Server Port Number	The data identifies the port number for the port server where each camera resides.
Community Name	The data identifies the community name for each camera.
Attach to Video Device	If selected, additional IP video parameters must be supplied.

The Design-Build Firm shall provide the following fields for IP video:

**Table 1.3: IP Video Documentation Requirements**

<b>Data</b>	<b>Description</b>
Video Device IP Address	The data identifies the IP address for the encoder.
Blackout	The data determines if the camera is restricted.
Video Device Type	The data identifies the video device type (IP video device) for the encoder.
IP Streaming Driver ID	The data identifies the unique IP video switch driver name.
Card Number	The data identifies the card number for the encoder.
Manufacturer	The data identifies the manufacturer values of the encoder.
Model	The data identifies the model of the encoder.
Streaming Type	The data identifies the streaming type (values: elementary, transport, program) for the encoder.
Secondary Interface	The data identifies the secondary interface for the encoder that enables users to maximize the number of inputs for the encoder.
Snapshot Requested	The data determines if snapshots are generated for the encoder.

The Design-Build Firm shall provide the following data for each DMS to be configured:

**Table 1.4: DMS Configuration Documentation Requirements**

<b>Data</b>	<b>Description</b>
Sign Name	The data identifies the unique name of each DMS.
Center ID	The data identifies the unique name of the center where each DMS resides.
Protocol	The data specifies the protocol (values: SNMP, SNMP (PMPP), SunGuide <sup>®</sup> (for Trailblazers) for each DMS.
Connection Type	The data specifies how each DMS is connected to the network (values: Direct, Modem, Long Distance Modem).
Poll Process	The data specifies the name of the driver for each DMS.
Packet Timeout	The data identifies the amount of time the driver will wait on a response from a DMS before timing out. The recommended time is 5 seconds.
Packet Retry Limit	The data identifies how many times a packet is attempted before it errors out. For most signs, the recommended number is 2; for signs prone to errors, this number can be increased.
Command Retry Limit	The data identifies how many times a command is attempted before it errors out. A command consists of multiple packets. The recommended number is 1.
Op Status	The data provides the operational status (values: Active, OutOfService) for each DMS.
Manufacturer	Values: Name of the sign manufacturer.

<b>Data</b>	<b>Description</b>
Number of Lines	The data identifies the number of displayable lines for each DMS.
Number of Columns	The data identifies the number of characters that can be displayed using a normal font.
Beacons	The data identifies whether the sign has beacons and, if so, specify the beacon address.
Beacon Address	The data identifies the address where the sign receives activate/deactivate beacon requests.
Day Brightness Level	The data identifies the numeric value for the brightness setting during the daytime.
Night Brightness Level	The data identifies the numeric value for the brightness setting during the nighttime.
Font	The size of the font currently displayed. Represented in horizontal pixels by vertical pixels. (Example: 5 pixels x 7 pixels)
Sign Type	Values: Fiber Optic, LED, Flip-Disk, Shutter
Location Description	This is a text field describing the location of each DMS.
Roadway	The data identifies the roadway where each DMS resides.
Direction	The data identifies the direction of the roadway where each DMS resides.
Latitude	The data identifies the latitude where each DMS resides.
Longitude	The data identifies the longitude where each DMS resides.
Address Type 1	The data identifies the address type (values: PMPP, SunGuide®) for each DMS. (If PMPP, then the DMS protocol should be SNMP (PMPP); if SunGuide® or MarkIV, then the DMS should use the same protocol name.)
Address Type 2	The data identifies the specific address type (values: Direct, PortServer, Dialup) of Address Type 1.
Address	The data identifies the device address for each DMS.
Community Name	The data identifies the community name for each DMS.

The Design-Build Firm shall provide the following fields for each DMS connected via a TCP/IP connection:

**Table 1.5: DMS with TCP/IP Configuration Documentation Requirements**

<b>Data</b>	<b>Description</b>
Port Server IP Address	The field identifies the IP address for the port server where each DMS resides.
Port Server Port Number	The field identifies the port number for the port server where each DMS resides.

The Design-Build Firm shall be responsible for providing all data necessary to populate the SunGuide® database. The Design-Build Firm shall coordinate with and provide this data to the SWIFT Center IT Manager in accordance with a mutually agreeable format and schedule as determined in the Pre-

Integrations meeting. No additional contract time or cost will be provided to the Design-Build Firm for this effort. The SWIFT Center IT Manager will enter the appropriate data into the SunGuide® database. The Design-Build Firm shall be responsible for observing and verifying that the SWIFT Center IT Manager enters the correct data. At no time will the Design-Build Firm be granted SunGuide® administrative rights to the Department's SWIFT SunGuide® Software System.

The database developed and installed by the Design-Build Firm at the Sarasota-Manatee STMC shall be a duplicate of the complete database at the SWIFT Center, including the information on the existing Collier/Lee/Charlotte County devices. This shall also include Microsoft Clustering by Design-Build Firm personnel whose experience with Microsoft Clustering has been reviewed and approved by the Engineer.

## **1.4 Documentation Requirements**

### **1.4.1 Materials Submittal**

The Design-Build Firm shall provide the following submittals for equipment and components for each of the project elements and subsystems identified in this MTR:

*Catalog Cut-sheets:* The manufacturer/vendor-provided catalog cut-sheets shall pictorially describe the item or component in detail. The exact model of the proposed device shall be clearly marked.

*Installation Procedures:* The manufacturer/vendor-provided manual shall indicate clearly and pictorially the installation procedures for all components, subassemblies, and assemblies.

*User Manual:* The user manual shall describe, in sufficient level of detail, how the equipment must be operated. The user manual shall include such pertinent operational information as control layouts, displays, etc., for properly operating a fully functioning unit. The manual shall document operating procedures describing the initial turn-on and adjustments to ensure an operational system within the performance requirements, as well as system-level corrective maintenance procedures. The manual shall include information on troubleshooting common device errors and malfunctions.

*Maintenance Manual:* The manufacturer/vendor-provided maintenance manual shall indicate clearly and pictorially the maintenance procedures for all components, subassemblies, and assemblies. The manual shall include pertinent information on maintaining and repairing the equipment, hardware, software, connections, interfaces, and peripheral cabling as applicable. The manual shall include sections that completely describe the theory of operation using block diagrams and schematic drawings; diagnostic and repair procedures for corrective maintenance of the unit; assembly and disassembly instructions and drawings; layout drawings showing location of all components; and a complete components listing showing component type, ratings, and acceptable manufacturers. The manual shall include all pertinent preventative maintenance activities recommended by the manufacturers and the associated timeframes.

*Software Manual:* For software that is furnished for operating an individual subsystem, a software manual shall be provided describing the operation of the software, including all the features of the graphical user interface.

*Warranty Documentation:* The warranty documentation for the equipment shall warrant against all defects and/or failure in design, materials, and workmanship for the minimum warranty duration specified for each piece of equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786 or the MTR, whichever is greater. The Design Build Firm shall identify in the Technical Proposal each guaranteed feature with its associated type of distress and threshold values defining the extent and magnitude of such distresses that will necessitate remedial work and the proposed remedial action plan for each distress. Warranty documentation shall be submitted prior to and as a condition of Final Acceptance

*Integration Plan:* The Design-Build Firm shall provide a detailed plan of action that discusses the process for integrating the new devices into the existing SunGuide® Software at the SWIFT Center with minimal interruptions to the ongoing operations of the Collier/Lee/Charlotte FMS devices. The plan shall include the process for upgrading the existing video wall at the SWIFT Center. The additional workstations at the SWIFT Center and the new workstations at the Sarasota-Manatee STMC shall also be included for installation and integration. All known interruptions to services shall be planned for off-peak hours and coordinated with the SWIFT Center Manager and operations staff.

*ITS Fiber Management (ITSFM) Tool Worksheets:* These worksheets shall be completed in their entirety for use in inputting the information about the new devices into the ITSFM Tool. The forms include information about the type of device site, device make and model number, IP addresses, serial numbers, GPS coordinates, power service, fiber details, etc. The most up to date worksheets shall be provided to the Design-Build Firm, upon request, for completion prior to final acceptance of the project.

The Design-Build Firm shall not send in submittal data or cut sheets for the switches and other networking equipment until the final design is released for construction.

#### **1.4.2 Test Plans**

The Design-Build Firm shall prepare Test Plans for the individual subsystems provided for this project. The Test Plans shall be prepared based on the testing requirements identified in the individual subsystem sections of this MTR and the Supplemental Specifications. Where the test requirements are not identified, the Design-Build Firm shall prepare detailed plans for review by the Department before testing. The Test Plan shall include, as a minimum, the following sections:

- Date, time, location, and estimated duration of test
- Name of firm and names of engineers designated as witnesses
- Description of subsystem to be tested, showing a test of every function of the equipment or system to be tested
- Test equipment list
- Test objectives
- Test sequence details – a step-by-step outline of the test sequence to be followed
- Test duration
- Expected results – a description of the expected operation outputs and test results
- Test result forms – forms to be used to record all data and quantitative results obtained during the test
- A connection diagram wherever applicable
- Software - the Design-Build Firm shall supply the Department with full documentation and shall supply a copy of all diagnostic software

#### **1.4.3 Requirements Traceability Verification Matrix (RTVM)**

The Systems Engineering Process directs the development of the Requirements Traceability Verification Matrix (RTVM). The RTVM is a tracking document used to verify that contract requirements are met using four different methods: analysis, demonstration, inspection and testing. Each of the contract requirements from the RFP and this MTR shall be documented in the RTVM with a verification method.

The Department shall prepare the initial RTVM for use by the Design-Build Firm. The Design-Build Firm shall update the RTVM as contract requirements are verified by one of the four methods.

The RTVM is a living document and shall be updated and submitted to the Department for review with each milestone demonstrating and documenting how successful completion of the verification satisfies the contract requirements. The Department will review the RTVM and provide comments, as needed, to the Design-Build Firm for incorporation into the RTVM. Once the project construction is finished and the testing is successfully completed, the RTVM should be finalized by the Design-Build Firm and delivered

with the as-builts to the Department.

## **1.5 Training Requirements**

The Design-Build Firm shall provide three separate training modules:

- Training module 1:  
Training on the basic description of capabilities and functions and the purpose in the system of each subsystem or component. Training that uses vendor-provided software and hardware shall be optional based upon the preference of the Engineer.
- Training module 2:  
Training on the operation and maintenance of each subsystem and component provided in this project using the SunGuide<sup>®</sup> Software System.

### **1.5.1 Training Documentation**

The Design-Build Firm shall prepare training material for providing training on the operation and maintenance of each subsystem/component provided in this project using vendor-provided operation and management tools, including all necessary software and hardware.

The Design-Build Firm shall prepare training materials to be used on the operation and maintenance of each subsystem/component provided in this project using the SunGuide<sup>®</sup> Software System.

The training materials shall include an introductory level briefing to familiarize attendees with the subsystem/component. The training materials shall also include an engineering/operations course that provides an overview for basic understanding of the subsystem/component operation and how it fits into the overall system. The materials shall include subsystem elements, theory of operation of components, operating procedures and capabilities, hardware and software configuration, and software applications.

The Design-Build Firm shall furnish 15 sets of approved training course materials for each one of the three separate training modules. All materials, including any figures and drawings, shall also be submitted in electronic format on CD-ROM. Fifteen copies of the CD-ROM shall be submitted to the Department and shall adhere to the CD-ROM requirement and CADD deliverable sections.

All training modules shall be recorded onto DVD for use in future training of operations and maintenance personnel on the referenced material. The Design-Build Firm shall provide two sets of training DVDs to the Department at Final Acceptance.

## **1.6 Warranty**

The Design-Build Firm shall provide a manufacturer's warranty(s) for materials as described in this document. Said warranty(s) shall be transferable from the Design-Build Firm to the Department upon the expiration of the Design-Build Firm's Maintenance Agreement as described in section 1.7.

System components shall be warranted against all defects and/or failure in design, materials, and workmanship for the minimum warranty duration specified for each item of equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786 or this MTR, whichever is greater.

Any components not covered under the FDOT Standard Specifications, Supplemental Specifications, or this MTR shall have a one year warranty provided by the Design-Build Firm. If the manufacturer's warranties for project components are for a longer period, those warranties shall continue to apply.

The warranty period shall begin as of the date that the Department issues written notice of Final Acceptance. The Maintenance Agreement, as described in section 1.7, shall cover the first year of the Warranty. At the conclusion of the Maintenance Agreement, the Design-Build Firm shall transfer the

balance of the Manufacturer's Warranties to the Department.

The Department reserves the sole right to determine defects in the materials and systems installed or modified by this project and the acceptability of the warranty repair and defect correction, including adjustment of equipment provided as a part of this project.

### **1.7 Maintenance Agreements**

At the conclusion of the project and concurrent with Final Acceptance, the Design-Build Firm shall provide agreement(s) to maintain all equipment installed under this contract for a period of one year at no additional cost to the Department. The Design-Build Firm's maintenance agreement shall provide a point of contact that can be reached by telephone and/or electronic communications 24 hours/day 7 days/week and a knowledgeable technical person at the site of the failure within 4 hours of notification.

The Maintenance Agreement shall include the following services:

- Submittal of a repair or replacement plan within 48 hours from the receipt of the notice of the occurrence from the Department;
- Removal of failed equipment;
- Returning of failed equipment to the manufacturer for warranty repairs;
- Tracking and reporting on manufacturer's repair status;
- Reinstallation of the repaired equipment; and
- Testing and documentation that the repairs are satisfactorily completed.

Repairs shall be aggressively pursued to completion and restoration of equipment to service.

If the Design-Build Firm is unable or unwilling to begin the repairs of defects within five days of the receipt of notice of the occurrence by the Department, then the Department may perform the repair of the deficiencies or defects and submit a claim to the Design-Build Firm for the repairs.

Any ITS device or ancillary component that, in the opinion of the Department, fails three times after Final Acceptance and prior to the expiration of the Maintenance Agreement shall be judged as unsuitable and shall be replaced by the Design-Build Firm with a new ITS device or ancillary component of the same make and model at no cost to the Department.

The Design-Build Firm shall perform preventative maintenance services on all the ITS components covered under the Maintenance Agreement on a quarterly basis during the year following final acceptance. The Department shall provide the minimum preventative maintenance activities for the Design-Build Firm's use.

The Design-Build Firm shall provide all preventative maintenance checklists to the Department quarterly and at the end of the Maintenance Agreement term. The Design-Build Firm shall conduct a meeting with the Department to discuss the end of the Maintenance Agreement and transfer of responsibilities to the Department. This meeting shall occur 45 days prior to the end of the Maintenance Agreement term. The Design-Build Firm shall provide the Department with a schedule of the preventative maintenance activities as a stipulation of Final Acceptance.

## **2.0 ENHANCEMENTS TO THE SARASOTA-MANATEE COUNTY SATELLITE TRANSPORTATION MANAGEMENT CENTER (STMC)**

The following are the requirements for the enhancements to the Sarasota-Manatee STMC and connection to the SWIFT Center. Entry into the STMC shall require a pass issued by the STMC Operator (Manatee County). The STMC Operator will issue passes only after a complete background check, including fingerprinting, of each applicant. Since the time to complete the required checks depends on the background of the applicant, it is not possible to state the time required to complete the check. The Design-Build Firm shall include this time in their schedule as no additional time will be granted for processing of STMC pass requests.

### **2.1 Integration with the I-75 FMS**

The Sarasota-Manatee STMC SunGuide® environment is envisioned to work primarily as a remote workstation to the SWIFT Center SunGuide server installation. The I-75 FMS components within Sarasota and Manatee Counties shall operate through the remote connection at the Sarasota-Manatee STMC 16 hours per day Monday through Friday and shall turn over operations to the SWIFT Center operators overnight and on weekends. The Sarasota-Manatee STMC must also seamlessly access and manage the I-75 FMS in District 1 (Collier, Lee, Charlotte, Sarasota and Manatee County devices) without access to the SWIFT Center servers and shall serve as a redundant backup system for the I-75 FMS should a cable break occur between the two RTMCs. If a break occurs in the 96-strand fiber, the Sarasota-Manatee STMC shall control the devices north of the break and the SWIFT Center shall control the devices south of the break.

In the case of a disaster that totally disables the SWIFT Center or creates a situation requiring an evacuation, the Sarasota-Manatee STMC must be able to manage all of the devices in the I-75 FMS network.

### **2.2 Communication Equipment**

The Design-Build Firm shall install a new Gigabit Ethernet switch at the Sarasota-Manatee STMC, the same as or equivalent to the Gigabit Ethernet switch (NetIron MLX-4 Router and FastIron WS648G Switches) to be provided at the SWIFT Center per section 3.2 of this MTR. One Gigabit Ethernet port shall connect directly to the SWIFT Center's Core Gigabit Ethernet switch via a pair of dedicated fiber strands within the I-75 FMS fiber optic cable. Three Gigabit Ethernet ports shall connect to the three closest FMS field hub switches using three separate pairs of dedicated fiber strands within the I-75 FMS fiber optic cable.

The Design-Build Firm shall provide a 45 Megabit internet connection, for the exclusive use of the FDOT, at the STMC. It shall be available to and at all FDOT workstations and back office locations. This connection shall be provided as necessary to meet the requirements of the Sarasota-Manatee STMC and shall be maintained until the date of Final Acceptance.

The Design-Build Firm shall provide a new firewall that is fully compatible with the existing SWIFT Center firewall, including but not limited to Software Blade Architecture, Site to Site VPN, IPS, Advanced Routing, High Performance, and Web Security. This firewall shall include four 2-port 1000Base-SX Ethernet SFP cards. A datalink between the two firewalls shall be configured to provide a redundant path between the SWIFT Center and the Sarasota-Manatee STMC. This work shall include the configuring of any VPNs necessary for creating a redundant ring between the two RTMCs.

### 2.3 Network Infrastructure

The Design-Build Firm shall install a new set of I-75 FMS servers at the Sarasota-Manatee STMC, in four new server racks (not network racks) and identical in performance and number to the existing set of I-75 FMS servers at the SWIFT Center. The new racks shall have front and back mesh doors that are lockable with two keys per rack and all keyed alike. The cable ladder over the existing racks shall be extended over the new racks. Each rack shall consist of two (eight total) Power Distribution Units that shall provide power distribution to each server rack. These new Sarasota-Manatee STMC servers shall work as hot stand-by servers in case the SWIFT Center SunGuide® servers fail or there is a loss of connectivity with the SWIFT Center. All of the current and future I-75 FMS devices and all of the current and future SunGuide® operators shall be identical in both sets of server databases. The databases of these new servers shall automatically and dynamically synchronize with the servers of the SWIFT Center using the Gigabit Ethernet connectivity over the I-75 FMS fiber optic cable. The Sarasota-Manatee STMC servers shall be part of a Microsoft Clustering group for the SunGuide® Software System. The Design-Build Firm is responsible for the design, procurement, installation and integration of all necessary equipment to provide the above configuration. This shall include all ancillary components not specifically detailed, but necessary to make the system function as intended.

The Design-Build Firm shall provide, install, configure and integrate into the system a Smart Array Network (SAN) (HP MSA 2312sa G2) consisting of at least the following:

- High Performance Modular Smart Array controller with two 1 GbE ports per controller;
- Dual Controller;
- Four 3 Gb SAS ports per controller;
- Supports Fiber Channel ports, iSCSi ports, and SAS ports;
- RAID levels 0, 1, 3, 5, 6, 10, 50;
- Redundant power supplies;
- Supports expansion for additional enclosure;
- Non-disruptive on-line controller code upgrade;
- Heterogeneous support for 32 bit and 64 bit Windows OS;
- Qualified and certified for Windows clustering;
- Minimum of 6 TB of disk storage; and
- Web browser support.

Two servers for the SunGuide® Database each meeting at least the following criteria:

- 2x Intel Xeon 2.6 GHz Processors;
- 12 GB Memory;
- 2 x 146 GB 15K 2.5 HDD (Hot Pluggable);
- Redundant High output power supplies (Hot pluggable);
- Windows Server 2008 R2 Enterprise;
- DVD ROM;
- On-Board dual Gigabit Network Adapters;
- 2 x HBA cards to connect to SAN; and
- Oracle 11.2G with Safeguard.

Four servers for the SunGuide® Application each meeting at least the following criteria:

- 2x Intel Xeon 2.6 GHz Processors;
- 8 GB Memory;
- 2 x 146 GB 15K 2.5 HDD (Hot Pluggable);
- Redundant High output power supplies (Hot pluggable);
- Windows Server 2008 R2 Enterprise;
- DVD ROM;

- On-Board dual Gigabit Network Adapters; and
- 2 x HBA cards to connect to SAN.

## **2.4 Video Wall Display**

At the Sarasota-Manatee STMC, there shall be two independent video wall systems with their dedicated video wall controllers and video display cubes. One video wall system is dedicated to the operation of the Manatee and Sarasota Counties ATMS and has been installed by others. The second video wall system is dedicated to the operation of the I-75 FMS and shall be designed, procured, installed and integrated by the Design-Build Firm. There shall be no commonalities between these two video wall systems, except that they share the same physical wall.

To display the images from the FMS devices, the Design-Build Firm shall expand the existing video wall with 12 new display cubes similar to the existing cubes, together with ancillary equipment and cabling, so that the entire wall appears as one unit. A separate video wall controller compatible with the SunGuide<sup>®</sup> software and on the Approved Products List (APL) shall be provided. A software-based controller installed on servers is acceptable as long as it meets the requirements herein and is included on the APL.

The Design-Build Firm shall install twelve new four-channel decoder cards, dedicated to displaying 48 simultaneous I-75 FMS CCTV camera images on the new video wall. Each of the 12 video cards shall decode both MPEG-2 and MPEG-4 video streams and be configured to decode four simultaneous MPEG-2 video streams. In addition, each of these 12 decoder cards shall decode, or shall be firmware upgradable to decode H.264 video streams. The 12 cubes within the new video wall must each display 4 images simultaneously and tour (or scroll) through a total of 200 CCTV camera images.

The support structure for the 12 cubes shall support 4 additional cubes which will be installed later by others.

As part of the video wall installation, the Design-Build Firm shall remove the existing curtain covering the space intended for the 12 FDOT cubes, leave the upper curtain over the entire wall, and fill any gaps or holes in the wall surrounding the new displays and the existing ATMS video wall to provide a finished look that appears as one unit. This finished look shall incorporate a frame similar to that at the SWIFT Center.

The Design-Build Firm is responsible for protecting their equipment within the Sarasota-Manatee STMC as the video wall system is installed. The Design-Build Firm shall be responsible for repairing any damage it causes to the existing facilities in the Sarasota-Manatee STMC, performing the repairs within the current contract time at no additional cost.

### **2.4.1 Video Wall Control**

The Design-Build Firms shall provide video wall control that configures the display format of the video images on the video wall display. The video wall control shall include:

- Video wall management system software
- Remote control system
- Touch panel key pad system including:
  - Hardwire touch panel
  - Wireless touch panel

## **2.5 Workstations**

The Design-Build Firm shall provide 11 new SunGuide<sup>®</sup> FMS workstations dedicated to I-75 FMS usage at the Sarasota-Manatee STMC. The five workstations in the control room shall have four 22" LCD monitors and the six back office workstations shall have three 22" LCD monitors. The hardware of these

new workstations shall be configured as regular SunGuide® clients of the SWIFT Center, identical to the I-75 FMS client workstations located at the SWIFT Center. The Design-Build Firm is responsible for all necessary power and communications necessary to integrate these workstations into the I-75 FMS network.

These workstations shall meet or exceed the following minimum specifications:

- Intel Core 2 Quad Q9650 3.0 GHz or better CPU
- Video card(s) to handle 4 monitors
- At least 8 GB of RAM
- At least 150 GB hard drive
- DVD/CDROM drive
- 10/100/1000 Network Interface card
- Keyboard and mouse
- Speakers

These workstations shall have the following minimum software installed:

- Windows 7 Professional 64 bit Operating System
- All Windows 7 updates and security patches
- Microsoft Office Professional (Latest Version)
- Adobe Reader (Latest Version)
- The Design-Build Firm shall coordinate with the SWIFT Center Operations Manager and IT Manager to have Symantec Endpoint Protection installed and to ensure that the workstations provided are properly configured to accept the SunGuide® software.

The Design-Build Firm shall provide 24 wireless headsets, each with one earphone and a microphone. The microphones shall be configured into the network to permit each workstation operator to record HAR messages and 511 floodgate messages and listen to existing department emergency management scanners over the internet via software provided by the Department.

## **2.6 Printer, Copier, Scanner and Fax**

The Design-Build Firm shall provide two all-in-one (AIO) multifunction printer/copier/scanner/fax combinations connected to the network to provide centralized document management, distribution and production. One AIO shall be located in the back office area and one shall be located on the control room floor. The AIOs shall meet the following minimum requirements:

General Features:

- 30-sheet document feed;
- 150-sheet input capacity;
- 125-sheet output capacity;
- Media sizes: Envelope, ledger, letter, and legal; and
- Media type: Paper (standard, light, intermediate, heavy, glossy and high gloss), envelope, cardstock, transparent label.

Printer Features:

- Black and white; and
- Duplex printing from single side documents.

Copier Features:

- Black and white;
- Copy settings: contrast, resolution, reduction/enlargement, number of copies, paper size;

- Duplex copying from single side copies; and
- Reduction/enlargement: 25-400%.

Scanner Features:

- Color;
- Simplex and duplex; and
- Flatbed and sheet fed.

Fax Features:

- Auto redial;
- Fax forwarding;
- Fax auto reduction;
- Distinctive ring detection;
- 120 speed dials; and
- 120 broadcast/group dials.

## 2.7 Electrical Equipment

Preliminary provisions have been made to support the electrical requirements of the new video wall and its supporting equipment. The Department will make available the best information on the existing electrical installation, however the accuracy of the information made available is not guaranteed. The Design-Build Firm shall investigate and verify the existing electrical system conditions. The Design-Build Firm shall document the effect the proposed loads will have on the existing system as far uplink as the main building electrical disconnect switch. The Design-Build Firm shall be responsible for improvements to the existing electrical system necessary to support the equipment being installed so that the final building electrical system is fully compliant with the NEC.

## 2.8 Furniture Requirements

Per Section 946.515 (2), F.S., furniture purchases must be made from PRIDE unless a “reasonable determination” can be made that the product available from PRIDE does not meet the performance specifications, comparable price and quality requirements of the agency. The “reasonable determination” must state the specific deficiencies or shortcomings in quality and/or disparity in pricing of the PRIDE products. The Design-Build Firm shall use Form No. [375-040-66](#) to document the determination and include with the project documentation.

This is the website Uniform Resource Locator (URL) for the PRIDE furniture estore. Furniture selections are at the left of the page.

<http://www.prideestore.com/Pridestore/Products/Furniture/Default.aspx>

If the Design-Build Firm determines that furniture cannot be purchased from PRIDE, they shall use a state contract for the procurement. If the product needed is not available from either PRIDE or State Contract, the Design-Build Firm must document this by using Form No. [375-040-02](#).

State contracts available for the purchase of furniture:

[http://dms.myflorida.com/business\\_operations/state\\_purchasing/vendor\\_information/state\\_contracts\\_agreements\\_and\\_price\\_lists/state\\_term\\_contracts/furniture\\_office\\_and\\_files](http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contracts/furniture_office_and_files)

[http://dms.myflorida.com/business\\_operations/state\\_purchasing/vendor\\_information/state\\_contracts\\_agreements\\_and\\_price\\_lists/state\\_term\\_contracts/furniture\\_educational\\_institutional](http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contracts/furniture_educational_institutional)

[http://dms.myflorida.com/business\\_operations/state\\_purchasing/vendor\\_information/state\\_contracts\\_agreements\\_and\\_price\\_lists/state\\_term\\_contracts/furniture\\_library](http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contracts/furniture_library)

The Design-Build Firm shall provide furniture for the five back offices and the administrative assistant area.

Each of the five offices shall contain:

- A six foot wide desk with a four foot return;
- A 5-way adjustable desk chair;
- A guest chair;
- A 4-drawer file cabinet that accepts legal size files; and
- A 4-shelf bookcase.

The TMC Manager's office shall have an additional guest chair. The administrative assistant area shall contain a counter with writing area that is installed to close off the area from the walkway. The furniture quality shall be equal to or better than that in use at the SWIFT Center.

## **2.9 Warranty**

The Design-Build Firm shall provide a manufacturer's warranty(s) for materials as described in this document. The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

System components shall be warranted against all defects and/or failure in design, materials, and workmanship for the minimum warranty duration specified for each item of equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786 or this MTR, whichever is greater.

If the manufacturer's warranties for the components are for a longer period, those warranties shall continue to apply.

All hardware requires a three-year service plan agreement for next business day parts and service from the date of Final Acceptance. All software, except the Oracle software, requires three years of licensing and telephone customer support from the date of Final Acceptance.

The Department reserves the sole right to determine defects in the materials and systems installed or modified by this project and the acceptability of the warranty repair and defect correction, including adjustment of equipment provided as a part of this project.

### **3.0 IMPROVEMENTS TO THE SWIFT CENTER**

The Design-Build Firm shall provide the following improvements to the SWIFT Center. These improvements shall be documented as part of an overall integration plan as detailed in section 1.4.1 of this MTR. The Design-Build Firm's activities in the SWIFT Center control room shall be limited to the time between 10:00 AM and 2:00 PM or between 7:00 PM and 5:00 AM the next day on week days. There are no prohibited hours on non-holiday weekends. The maximum time that the center can be "down" is 4 hours in any 24-hour period and only during the hours shown above.

#### **3.1 Video Wall Controller Upgrades**

There is an existing Barco Transform A-18 Video Wall Controller (VWC) at the SWIFT Center. The Design-Build Firm shall provide a new VWC compatible with the SunGuide® software and on the Approved Products List (APL) to integrate the new and existing CCTV camera images into the SWIFT Center video wall and to provide for the following:

- The 15 cubes in the video wall must display 4 images simultaneously and tour (or scroll) through a total of 200 CCTV images
- Switching capability must be installed and available for two existing large screen monitors – one in the lobby and one in the downstairs conference room
- Switching capability must be installed and available for 6 future large screen monitors
- Decoding of MPEG-2, MPEG-4, and H.264 video streams

A software-based controller installed on servers is acceptable as long as it meets the requirements herein and is included on the APL. All controllers must be capable of integration with SunGuide®.

The Design-Build Firm shall procure and install the additional equipment needed such that the new images are integrated seamlessly into the wall display and large screen monitors and that the previously available functionality is available to/for the new cameras installed as part of this construction contract.

There is an existing Crestron control system at the SWIFT Center that includes a hardwired touchpanel, a wireless touchpanel and a media controller. The Design/Build Firm shall reintegrate this system with the new video wall controller or provide an alternate solution for approval by the Department.

#### **3.2 Standby Switch**

The Design-Build Firm shall provide a new switch for the SWIFT Center with a minimum of 40 fiber ports (1 Gig each) and a minimum of 96 copper ports 10/100/1000 Layer-2. This switch shall mirror the current core switch that consists of a Layer-3 router and 2 Layer-2 switches with 48 copper ports each. This switch is intended as a backup to the core switch and will be installed by others.

#### **3.3 Warranty**

The Design-Build Firm shall provide a manufacturer's warranty(s) for materials as described in this document.

System components shall be warranted against all defects and/or failure in design, materials, and workmanship for the minimum warranty duration specified for each item of equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786 or this MTR, whichever is greater.

If the manufacturer's warranties for the components are for a longer period, those warranties shall continue apply.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

All hardware requires a three-year service plan agreement for next business day parts and service from the date of Final Acceptance. All software, except the Oracle software, requires three years of licensing and telephone customer support from the date of Final Acceptance.

The Department reserves the sole right to determine defects in the materials and systems installed or modified by this project and the acceptability of the warranty repair and defect correction, including adjustment of equipment provided as a part of this project.

## **4.0 CAMERA SURVEILLANCE SYSTEM**

### **4.1 Description**

There is a camera surveillance system monitoring I-75 in Collier, Lee, and Charlotte Counties from the Collier/Broward County line to approximately one mile north of the Charlotte/Desoto/Sarasota County line. The SWIFT Center monitors the camera images on this section of I-75.

In this Sarasota and Manatee County FMS, the SWIFT Center will monitor the additional CCTV cameras required. As part of this project, all new and existing camera images shall be integrated into the new video wall at the Sarasota-Manatee STMC that shall function as a redundant backup to the existing SWIFT Center camera surveillance system.

The CCTV camera system shall provide complete coverage for the project limits per the following minimum requirements:

- Space cameras at approximately one mile, or closer if required for complete coverage, between the existing CCTV one mile north of the Charlotte/Desoto/Sarasota County Line and the intersection of I-275 and I-75.
- Provide viewing coverage of both directions of cross roads and on- and off-ramps at all interchanges.
- Provide full video coverage of both directions of I-75 within the project limits without gaps per the video survey.
- Camera placement shall allow the RTMC/STMC operators to read all DMS messages for confirmation of message and confirm all HAR Beacons when lit.
- Provide full coverage in areas with trees in the median such that trimming of the trees will not be required to maintain the specified coverage.

#### **4.1.1 Camera Assembly**

A camera assembly is defined as a CCTV color/monochrome camera enclosed in a domed environmental housing filled with dry nitrogen, an integral motorized lens, a camera positioner, an integral receiver/driver, and all mounting hardware and power supplies. The camera shall be capable of individual, or local, camera site control by way of a laptop computer.

- The camera assembly shall be compliant with FDOT Supplemental Specification 782-1.
- The camera shall have a minimum 35x motorized optical zoom lens with automatic iris.
- The camera assembly shall provide Image Stabilization capability to compensate for the blurring of the image when the camera experiences movement due to strong winds, especially when zoomed in.
- The dome enclosure of the CCTV camera shall be capable of maintaining at least 50 percent for a minimum of 18 months.

#### **4.1.2 Software**

The image from each camera site and the control data transmitted to the camera assembly from the SWIFT Center and/or STMC central computer shall be transmitted over the Ethernet network. The image shall be encoded in the MPEG-2 digital format at the camera site and decoded with the SWIFT Center and/or STMC head-end equipment.

The system operator shall have the ability to address each camera assembly at a camera site via the Ethernet communication network.

#### **4.1.3 Camera Lowering Device**

The camera lowering device (CLD) shall be compliant with the FDOT Supplemental Specification 785-3.2.2.

The CLD shall support the camera assembly while in the locked position at the top of the pole and while lowering the camera to the ground.

The CLD shall consist of a system to raise and lower the CCTV camera assembly and shall include the cables, mechanical connectors, pulleys, cable guides, electrical connectors, and all other supporting components.

The CLD shall include a suspension contact unit for electrically connecting the power, data, and video cables of the CCTV camera assembly.

The connector pins for power, video, and control signals shall be made of material for maximum conductivity and corrosion resistance.

#### **4.1.4 Camera Site**

A camera site is defined as a single roadway location, containing a centrifugally cast, pre-stressed concrete pole with grounding and lightning protection, a CLD, a camera assembly, a grounded CCTV camera cabinet, a Video Encoder, a field Ethernet switch, power supplies including an UPS, all mounting hardware, and any and all other equipment required for a fully functional CCTV camera site.

#### **4.1.5 Video Encoder**

The Video Encoder shall be compliant with the FDOT Supplemental Specification 784-3.

The Video Encoder shall convert the CCTV camera's analog image into an encoded video stream. This encoded video stream shall support the MPEG-2 compression standard. The encoder shall support the transport mode and configured to use this mode by default.

In addition to the serial login, telnet login, and Simple Network Management Protocol (SNMP), the Video Encoder shall support a web browser interface for configuration and management.

The Design-Build Firm shall furnish all materials with the most recently developed and approved product versions that meet or exceed all FDOT standards, specifications, and requirements before the system is considered for acceptance. It is the Design-Build Firm's responsibility to ensure that all features, functions, and performance measures are met.

## **4.2 Design Requirements**

The Design-Build Firm shall select all camera sites for optimum viewing of I-75, the on-ramp and off-ramp conditions and the arterial cross streets for both day and night operations. In order to prevent light saturation of the CCTV camera image, the CCTV camera site shall be located more than 50 feet away from any high mast lighting pole.

The location of the network of cameras shall provide:

- Full viewing coverage of both directions of I-75 within the project limits.
- Viewing of both directions of cross roads at interchanges.
- Viewing of all ramps at interchanges.
- Verification of SunGuide messages on DMS assemblies.
- Verification of HAR sign beacon activation.

All camera poles shall be located outside the clear zone as applicable to ramps and mainline travel lanes or behind existing guardrail in accordance with the *FDOT Roadway Design Standards*. If placed behind existing guardrail, there shall be enough room for a vehicle, including high lift trucks, to access the site for maintenance of the camera. Camera poles shall not be placed in the median or on the top or side of overpass slopes.

The selection of pole height and location shall be the responsibility of the Design-Build Firm, but shall be approved by the Department prior to final design.

Pole positioning for each camera site prior to placement of the pole shall be the responsibility of the Design-Build Firm, but shall be approved by the Department prior to final design. This positioning is required so that the occlusion created by the camera pole can be limited to the restricted field of view.

The Design-Build Firm shall perform a 360 degree field of view video survey at the proposed camera height for each CCTV camera site utilizing a bucket truck and the Design-Build Firm's proposed camera. The video survey shall provide a full coverage view of the I-75 corridor. The Design-Build Firm shall record these surveys for the Engineer's review and acceptance. The Design-Build Firm shall submit the video survey with the 60% plan submittal.

The minimum mounting height of the CCTV camera is 40 feet above the highest point of the roadway at the selected location. The camera height at interchanges shall be such that traffic stopped on overpasses does not obstruct the view. The camera view shall be free of obstructions. The maximum CCTV camera mounting height shall be 65 feet above ground level.

### **4.3 Functional Requirements**

Each camera site shall be provided with the appropriate communication equipment, including image encoding devices, a terminal server (if required) for the packaging of low-speed control data, and one Ethernet switch that takes the encoded images and duplex data stream and transmits this digital data to the SWIFT Center and/or STMC head-end equipment.

All network communication interconnection devices shall be specified in design documents submitted by the Design-Build Firm. When a fiber trunk cable is used for the interconnection process, the drop cable mid-span splicing process shall be utilized. The drop cable shall be terminated and placed within a fiber optic cable patch panel in an approved camera assembly control cabinet. From there, fiber optic patch cords shall be used to connect communication devices, unless otherwise specified.

Maintenance and construction of an installed assembly shall not require lane closures.

### **4.4 Applicable Standards**

The image from each camera site and the control data being transmitted to the camera assembly from the SWIFT Center and/or STMC central computer shall be transmitted over the Ethernet network. The image shall be encoded in the MPEG-2 digital format at the camera site and decoded with the SWIFT Center and/or STMC head-end equipment.

The system operators shall have the ability to address each camera assembly contained within a camera site by way of the Ethernet communications network. All communications between the SWIFT Center and/or STMC central computer and the camera site shall comply with the National Transportation Communications for ITS Protocol (NTCIP) requirements defined in the NTCIP 1205 standard.

The most recent versions of the NTCIP 1201, 1205 v01.08 Amendment 1 (August 2004), 1208, 2104, 2202, and 2301 standards shall apply to CCTVs for NTCIP compliance.

## 4.5 Material Requirements

The Design-Build Firm shall furnish all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance. It is the Design-Build Firm's responsibility to ensure that all camera system and subsystem features, functions, and performance measures specified are met.

All materials furnished, assembled, fabricated, or installed shall be new products obtained from the manufacturer or reseller. The materials, equipment, and components shall be Commercial Off The Shelf (COTS) products.

The supplied CCTV camera assembly shall be compatible with the SunGuide® Software System and shall be listed on the Approved Products List (APL) prior to installation.

### 4.5.1 Pole

All CCTV camera poles shall be compliant with the FDOT Supplemental Specification 785-3.

All camera poles shall be concrete poles. Suppliers must be on the FDOT State Materials Office listing of approved Materials/Producers Listings for Concrete-Drainage, Incidental and Pipe Sources.

The design criteria for the structural design of support structures and foundations shall be based on the Department's Design Standards, Department's Structures Manual Volume 9, and on the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (LTS-4)* with current Interims. Poles shall be designed for a 3-second gust of 130 mph with a design life of 50 years.

The following requirements apply to the manufacture of centrifugally cast, pre-stressed concrete poles. All poles measuring up to and equal to 75 feet in height shall be designed to have a maximum deflection not greater than 1 inch in a 130-mile per hour wind speed. All poles measuring more than 75 feet in height shall be designed to have a maximum deflection not greater than 1.5 inches in a 130-mph wind speed. This deflection shall be measured at the top of the support structure where the base of the pan-tilt device is attached. Minimum pole height shall be 40 feet above the roadway edge of travel.

Material requirements for pre-stressed spun concrete camera poles shall include:

- Concrete – Section 346 Class VI
- Provide written certification from the manufacturer of the pole(s) that it meets the requirements of this section, Standard Index 18113, and are the same pole(s) as shown on the approved shop drawings. This includes the shop drawings and calculations for poles in accordance with note 5 of Standard Index 18113.
- Construct concrete poles in accordance with Section 450. Assume responsibility for performance of all quality control testing and inspections required by Sections 346 and 450, however; the PCI personnel and plant certifications are not required
- Ensure that each pole is permanently and legibly marked as to pole manufacturer, pole type, length and the date cast at the same position as shown on the shop drawings.
- Hardware – All structural steel hardware shall conform to the *ASTM A36* standard and zinc alloy AC41A shall conform to the *ASTM B240* standard. The finish shall be hot-dipped and galvanized as required by the *ASTM A153* standard.
- Electrical ground – All poles shall be supplied with an electrical ground consisting of a #4 braided copper ground wire cast into the pole's wall at the hand hole box location.

The pole shall be designed and constructed so that all wiring and grounding facilities are concealed within the pole. All hand holes, couplings, through-bolt holes, and ground wires shall be cast into the pole

during the manufacturing process. The pole shall provide a continuous taper of 0.18 inch for every 1 foot of length.

All cable entry holes shall be installed according to the location selected by the Design-Build Firm based on the requirements. The cable entry holes shall be sized as required and shall be free from sharp edges for the passage of electrical wiring. Entry holes shall be compliant with the FDOT Design Standards Index No. 18113.

The CLD shall be mounted to a specially designed tenon bolted to the top of the pole as required. All poles shall have a minimum inside raceway dimension of 4 inches at the tip of the pole. All poles shall be provided with a fish wire to facilitate cable installation.

#### **4.6 Construction Requirements**

The Design-Build Firm shall furnish all tools, equipment, materials, supplies, and manufactured hardware, and shall perform all operations and equipment integration necessary to provide a complete, fully operational surveillance system.

The Design-Build Firm shall install the cameras and CLDs level so that the horizon is level when viewing from the SWIFT SunGuide Center and/or STMC.

#### **4.7 Testing Requirements**

All CCTV tests shall comply with the test requirements of FDOT Supplemental Specifications 782-1.4.1 and 782-1.4.2.

The Design-Build Firm shall perform the following three separate tests:

- **Stand-alone Test:** This test shall be a local full functionality test ensuring the encoded MPEG-2 streams are decoded over the Ethernet Network by a software decoder running on a laptop computer and a local pan-tilt-zoom (PTZ) test over the Ethernet Network utilizing an NTCIP PTZ control program running on the same laptop computer and ensuring at least three presets are working correctly utilizing the same NTCIP control program on the same laptop computer. These tests shall be exercised over the Ethernet Network by connecting the laptop computer to an Ethernet port of the closest Ethernet Switch. The Design-Build Firm shall provide the laptop computer, software decoder, and the NTCIP PTZ control program.
- **Subsystem Test:** This test shall be performed at the SWIFT Center and the STMC. All of the steps of the Stand-alone Test shall be exercised in an identical manner with the exception of connecting to an Ethernet Switch port that is located at the SWIFT Center and the STMC.
- **Operational Test of the Complete System:** This test shall be performed at the SWIFT Center and the STMC utilizing the SunGuide<sup>®</sup> System Software over the Ethernet Network running on a SunGuide<sup>®</sup> client machine to ensure the encoded MPEG-2 streams are decoded, a remote test of the PTZ functions and at least three presets are working correctly. The Department shall provide the SunGuide<sup>®</sup> client machine to the Design-Build Firm for testing from the SWIFT Center. The Design-Build Firm is responsible for providing the SunGuide<sup>®</sup> client machine at the Sarasota-Manatee STMC.

The Design-Build Firm shall notify the Engineer at least 14 calendar days prior to installation of the camera assembly so that the Engineer, or the designated representative(s), can be present at installation to establish the appropriate settings for the pan and tilt stops.

The Engineer shall be notified at least 14 calendar days in advance of the proposed date for all testing as defined above. The Engineer has the right to witness such tests or to designate a representative or entity to witness such tests on the Department's behalf.

If during the witnessing of any one of the above tests it is determined that a camera view is not as approved or per the above requirements, the camera site shall be adjusted to provide the appropriate view.

#### **4.8 Training and Manual Requirements**

The Design-Build Firm shall provide a maintenance manual for each assembly, including detailed specifications and information regarding the inventory of installed assemblies by location and corresponding serial numbers. The manual shall include weight and dimension information, the operating temperature and relative humidity requirements, and the system's general maintenance procedures. The manual shall also include:

- Resolution
- Sensitivity
- Optical zoom range
- Digital zoom range
- Zoom and focus presets
- Pan and tilt presets
- Ethernet connection specifications
- Power consumption
- An EIA 232/422/485 camera control interface

The Design-Build Firm shall also provide documentation, one set per camera site, detailing the technical and operational aspects of the completed installation. This documentation shall include device manuals, system diagrams, cabling diagrams, all field Engineering notes specific to each installation, full warranty information, and any other documentation required by the Engineer.

The Design-Build Firm shall also supply a minimum of two days of on-site training for operations and maintenance personnel regarding all functional, operational, and mechanical aspects of the camera assembly and the supporting network communication devices.

#### **4.9 Warranty**

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, assembly, fabrication, materials and workmanship for the minimum warranty duration specified for each type of equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786 as applicable.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## 5.0 COMMUNICATIONS HARDWARE

### 5.1 Description

The existing I-75 FMS field communications backbone consists of a gigabit Ethernet network connecting the SWIFT Center to localized hub sites. These hub sites act as aggregation points for edge switches located at CCTV cameras, DMSs, and other remote sites. All hub switches shall be gigabit Ethernet (1000Mbps) compatible.

An Ethernet edge switch with a minimum of two single mode fiber optic ports shall be used at all fiber drop locations where an optical signal needs to be converted into an electrical (Ethernet) signal. All edge switches shall be fast Ethernet compatible.

**A subset of an Ethernet edge switch is the media converter. The Design-Build Firm shall determine the required number of single mode fiber ports and 10/100 BaseT (copper) ports needed at locations which require a media converter. Design Requirements**

### 5.2 Design Requirements

#### 5.2.1 General

The Design-Build Firm shall determine the minimum required number of ports in all Ethernet switches.

The Design-Build Firm shall design the overall network communications, including locating hubs in conjunction with the SWIFT Center IT Manager.

The Design-Build Firm shall document that ITS equipment and Ethernet devices that are compliant with these MTRs and are compatible with the ones used for the Collier, Lee and Charlotte County FMS.

The Design-Build Firm's design shall assume the CCTV cameras will use six Mbps of bandwidth per camera.

The design shall account for the optical loss in the fiber optic cable, connectors, and communications hardware.

#### 5.2.2 Ethernet Core Switch

The existing Net Iron MLX core switch from Foundry Networks is located in the SWIFT Center in the communications equipment room.

The Design-Build Firm shall determine the minimum required number of additional (GBIC) blades consisting of a minimum of twenty optical GBIC or SFP-based ports, each capable of transmitting data at 1000 Mbps for the existing Net Iron MLX core switch.

*Optical Ports:* The GBIC or SFP-based ports (exact minimum number of ports to be determined by the Design-Build Firm) shall be capable of transmitting data at 1000 Mbps and be user configurable with standard reach (LX) or long reach (ZX) optics able to transmit over 25 miles.

Each GBIC shall consist of a pair of fibers with SC connectors for standard GBICs and LC connectors for SFP GBICs; one fiber will transmit data and one fiber will receive data and shall meet the following minimum requirements:

For LX GBIC:

- Optical receiver sensitivity: -20 dBm
- Optical transmitter power: -9.5 to -3 dBm
- Transmission distance: 25 miles or more
- Operating wavelength: 1310 nm

For ZX GBIC:

- Optical receiver sensitivity: -23 dBm
- Optical transmitter power: 0 to 5 dBm
- Transmission distance: 45 miles or more
- Operating wavelength: 1550 nm

For locations where edge switches communicate directly with the core switch, the 100FX ports shall be used. Each optical port shall consist of fiber pairs; one fiber will transmit data and one fiber will receive data, and shall meet the following minimum requirements:

- Optical receiver sensitivity: -30 dBm
- Optical transmitter power: -19 to -14 dBm
- Maximum transmission distance: Medium haul, 25 miles
- Operating wavelength: 1300 nm

The Design-Build Firm shall furnish all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance. It is the Design-Build Firm's responsibility to ensure that all system and subsystem features, functions, and performance measures are met as specified in this MTR.

### 5.2.3 Ethernet Hub Switch

Hub switches shall be placed at locations identified by the Design-Build Firm. The hub switches shall act as aggregation points for the edge switches located at CCTV camera sites, DMS sites, MVDS sites, RWIS sites, HAR transmitter and beacon sites, and similar remote locations. Hub switches shall be field hardened or located in a climate controlled communications equipment room as determined by the Design-Build Firm. Each hub switch shall communicate with the core switch(es) via a Gigabit Ethernet fiber optic cable connection. Hub switches shall meet the MTRs and be capable of handling expansion within the District 1 ITS network.

Hub switches shall be compatible with the modified core switch, and compatible with the existing system and switches.

The Design-Build Firm shall determine the minimum required number of 1000LX single mode fiber Gigabit ports that are capable of transmitting data at 1000 Mbps. Also, the Design-Build Firm shall determine the minimum required number of optical 100FX ports (for communications with the edge switches) that are capable of transmitting data at 100 Mbps.

*Copper Ports:* The Gigabit Ethernet hub switch (10/100/1000 Mbps ports) shall be capable of supporting jumbo frames, advanced Layer 2 and base Layer 3 switching, and be software upgradeable to full enterprise Layer 3. The switch shall include support for IP routing protocols such as RIPv1/v2 and OSPF, and support for multicast routing, including PIM-SM, PIM-DM, and DVMRP.

The Design-Build Firm shall determine the minimum number of ports. The connectors shall be RJ45 for Category 5 Unshielded Twisted Pair (UTP).

*Optical Ports:* The GBIC or SFP-based ports (exact minimum number of ports to be determined by the Design-Build Firm) shall be capable of transmitting data at 1000 Mbps and user configurable with standard reach (LX) or long reach (ZX) optics able to transmit over 25 miles.

The Design-Build Firm shall determine the minimum number of ports. Each optical port shall consist of fiber pairs; one fiber will transmit data and one fiber will receive data.

Each GBIC shall consist of a pair of fibers with SC connectors for standard GBICs and LC connectors for SFP GBICs. Each GBIC shall consist of a pair of fibers; one fiber will transmit data and one fiber will receive data and shall meet the following minimum requirements:

For LX GBIC:

- Optical receiver sensitivity: -20 dBm
- Optical transmitter power: -9.5 to -3
- Transmission distance: 6 miles or
- Operating wavelength: 1310 nm

For ZX GBIC:

- Optical receiver sensitivity: -23 dBm
- Optical transmitter power: 0 to 5 dBm
- Transmission distance: 45 miles or
- Operating wavelength: 1550 nm

The 100BaseFX ports shall provide communications with field hardened Edge switches. Each optical port shall consist of fiber pairs; one fiber will transmit data and one fiber will receive data and shall meet the following minimum requirements:

- Optical receiver sensitivity: -30 dBm
- Optical transmitter power: -19 to -14 dBm
- Maximum transmission distance: Medium haul, 25 miles
- Operating wavelength: 1300 nm

The Design-Build Firm shall furnish all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance. It is the Design-Build Firm's responsibility to ensure that all system and subsystem features, functions, and performance measures are met as specified in this MTR.

#### **5.2.4 Ethernet Aggregation Switch**

In its network architecture, the Design-Build Firm may elect to use an Ethernet Aggregation Switch that the Ethernet Edge switches connect to over 100Mbps fiber optic links and the Ethernet Aggregation Switch may connect either to another Ethernet Aggregation Switch or to the Ethernet Hub Switch over 1Gbps fiber optic links.

The Design-Build Firm shall identify Ethernet Aggregation Switches that are compliant with these MTRs and are compatible with the ones used for the Collier, Lee and Charlotte County FMS.

#### **5.2.5 Ethernet Edge Switch**

Edge switches shall be placed at locations identified by the Design-Build Firm. At a minimum, these locations shall include CCTV camera sites, DMS sites, MVDS sites, HAR transmitter and beacon sites, RWIS sites, and similar remote locations. Edge switches shall be field hardened. Each edge switch shall communicate with a predetermined hub switch or aggregate switch via a fast Ethernet fiber optic cable connection. The edge switches shall meet the MTRs and be capable of handling expansion within the District 1 ITS network.

The Ethernet edge switch shall be compliant with the FDOT Supplemental Specification 784-1. All Ethernet edge switches shall be an AC power only version. AC to DC power adapters are not acceptable.

The Ethernet edge switch shall be DIN rail mountable.

#### 5.2.6 Media Converter

Media converters shall be placed at locations identified by the Design-Build Firm. At a minimum, these locations may include MVDS, DMS, RWIS, and hub sites. The media converters shall be field hardened.

The Design-Build Firm shall provide 10/100BaseTX to 100BaseFX media converters and all necessary connections, interfaces, jumper cabling, and fasteners for installing the devices in a 19-inch standard rack.

The media converter shall support conversion of 10/100BaseTX electrical interface to 100BaseFX optical interface and act as a Layer 2 bridge in forwarding all Ethernet packets received on both electrical and optical links. The media converter shall be interoperable with the edge switch, hub switch, and Gigabit Ethernet switch for optical networking.

The media converter shall include the following features:

- A manual switch for hard-setting the optical port to either the full-duplex or half-duplex mode
- Auto-negotiation for speed and auto-cross MDI/MDI-X on RJ45 ports
- Switch-enabled link fault signaling to forward lost link awareness to each connected host
- A full array of status/diagnostic LEDs (power, link, speed)

The media converter shall meet the following requirements:

- Number of Ports: Two RJ45 10/100 BaseTX ports and one or two fiber 100BaseFX ports
- Fiber Media Type: single mode fiber.
- Distance: Over 6000 feet

The media converter shall meet the following environmental requirements:

- Operating temperature: -30° F to 165° F (-34° C to 74° C)
- Storage temperature: -40° F to 165° F (-40° C to 74° C)
- Relative humidity: 5% to 95% non-condensing
- Cooling Method: Convection cooled, case is used as heat sink

The media converter shall be rack mountable (DIN rail or panel mount) into a standard 19-inch EIA rack. All mounting kits, brackets, and hardware for mounting into a standard 19-inch rack shall be provided.

The power supply of the media converter shall meet the following requirements:

- 120/240 VAC;
- Min input 85 VDC;
- Max input 264 VDC;
- Fuse rating 3.15 amps; and
- Max power 3 W.

*Copper Ports:* The Design-Build Firm shall determine the minimum number of ports. The connectors shall be RJ45 for Category 5 UTP.

*Optical Ports:* The Design-Build Firm shall determine the minimum number of ports. Each optical port shall consist of fiber pairs; one fiber will transmit data and one fiber will receive data. The Design-Build Firm shall determine the connector type (SC, ST or LC).

### 5.3 Construction Requirements

The Design-Build Firm shall furnish all tools, equipment, materials, supplies, and manufactured hardware, and shall perform all operations and equipment integration necessary to provide a complete, fully operational Gigabit Ethernet network. All equipment shall be mounted in 19-inch communications racks. All cabling shall be:

- Neatly tagged with permanent labels at both ends of every cable
- Secured with wire ties and cable management hardware in the communications racks
- Grounded to rack grounding hardware

### 5.4 Training and Manual Requirements

#### 5.4.1 Submittals

The Design-Build Firm shall provide the following documentation for equipment and components for each applicable device. The outline, provided below, shall be used as a guide for assembling a documentation package for submission to the Engineer. This guide does not relieve the Design-Build Firm from submitting additional information to form a complete submittal package.

- Catalog cut-sheets: Information provided by the manufacturer or vendor that pictorially describes the item or component
- Manufacturer specifications: A detailed specification prepared by the item or component manufacturer
- Installation procedures: A manual prepared by the manufacturer that indicates the installation procedures for components, subassemblies, or assemblies
- Operation Procedures: A manual prepared by the manufacturer that indicates the proper operations and detailed troubleshooting procedures for all components, subassemblies, and assemblies
- Maintenance procedures: A manual prepared by the manufacturer that indicates the maintenance of all components, subassemblies, and assemblies
- Training schedule: A schedule prepared by the Design-Build Firm that outlines the time for the required training sessions
- Training material: Course material for each of the training sessions required

The Design-Build Firm shall submit the submittal data and shop drawings for all equipment, materials, test procedures, and routine maintenance procedures required 30 calendar days before installation. The submittal data shall be provided to the Engineer for approval and shall include six copies of the manufacturer's descriptive literature, technical data, operational documentation, service documentation, and other pertinent materials that fully describe applicable equipment, hardware, software, interfaces, and peripheral cabling required for a fully operational system.

#### 5.4.2 Documentation

The Design-Build Firm shall provide three sets of documentation for all components in accordance with these MTRs. The documentation shall be assembled in volumes of three-ring binders that include title pages, indices, page numbering, and section dividers. The documentation shall consist of the following types of manuals:

*User's Manuals:* The user's manual shall describe, in sufficient level of detail, how the equipment must be operated. The user's manual shall include pertinent operational information such as control layout, displays, and procedures for properly operating a fully functional unit.

*Maintenance Manual:* The manufacturer/vendor-provided maintenance manual shall indicate clearly and pictorially the maintenance procedures for all components, subassemblies, and assemblies. The manual shall include pertinent information on maintaining and repairing the equipment, hardware, software,

connections, interfaces, and peripheral cabling as applicable. The manual shall include sections that completely describe the theory of operation using block diagrams and schematic drawings; diagnostic and repair procedures for corrective maintenance of the unit; assembly and disassembly instructions and drawings; layout drawings showing location of all components; and a complete components listing showing component type, ratings, and acceptable manufacturers.

*System Documentation Manual:* The system documentation manual shall describe the overall operation of the equipment with block level diagrams, identify all equipment in the system with module and option numbers, give a functional description for each system element, and explain how they function together in a complete operational system. The system documentation manual shall document operating procedures describing the initial turn-on and adjustments to ensure an operational system within the performance requirements as well as system-level corrective maintenance procedures.

*Software Manual:* The software manual shall fully document the device management software including full descriptions of functions, flowcharts, and utilities required to support, configure, monitor, and manage each type of device, as well as listings and associated descriptions for complete operation of software programs.

### **5.4.3 Training**

The Design-Build Firm shall prepare and deliver training courses on the communications devices and applicable components for individuals designated by the Department, to include up to 10 personnel. Two types of training courses shall be provided involving engineering/operation personnel and maintenance personnel (two-day course for engineering/operations personnel and one-day course for maintenance personnel). The training shall be delivered on dates mutually agreeable to the Design-Build Firm and to the Department. The Design-Build Firm shall provide the Department with a 30-day Notice of Intent to carry out the training so that arrangements can be made for attendance.

The training courses shall be developed to pertain specifically to the system, presuming that the course participants have no prior knowledge of the system and associated technology. The Design-Build Firm shall be responsible for providing an indoor classroom for training, which shall be comfortable and within close proximity of the SWIFT Center. The Design-Build Firm shall provide a draft of the training material to the Engineer for review and approval at least 60 days prior to the scheduled training. Adequate time shall be afforded for review and revision of the draft training materials. The Design-Build Firm shall furnish the classroom, audio-visual equipment, demonstration equipment, and "hands-on" equipment in support of the envisioned training. Each training participant shall receive a copy of course materials, including both comprehensive and presentation manuals. The Design-Build Firm shall provide two additional copies of these documents to the Engineer. The Design-Build Firm shall include all training-related costs in the unit price bid for each device. There will be no separate payment for training.

The training materials shall include an introductory-level briefing to familiarize attendees with each device. The engineering/operations course shall include an overview of the basic understanding of IP and Ethernet, subsystem elements, theory of operation of components, operating procedures and capabilities, hardware and software configuration, and software applications. The Design-Build Firm shall provide training that includes "hands-on" use of all communications devices installed. The maintenance course shall include relevant topics in electronics, communications, and cabling, and provide a detailed description and explanation of theory of operation of major device components; operation, test, and installation procedures; plus troubleshooting, diagnostics, and maintenance to the replaceable module level. The maintenance course shall also show how the system documentation should be used to operate, diagnose, maintain, and expand the system. The maintenance course shall also provide "hands-on" use of the system, laptop computer and software (to be provided by the Design-Build Firm during the course), system test equipment, and any other system equipment supplied.

## **5.5 Warranty**

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, assembly, fabrication, materials and workmanship for all equipment, materials, and operating system software furnished for the minimum warranty duration specified for each type of equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786 as applicable.

The warranty for the Ethernet hub switch and media converter shall be five years.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## 6.0 DYNAMIC MESSAGE SIGN

The Design-Build Firm shall install Dynamic Message Signs (DMS) as part of this project.

### 6.1 Design Requirements

The DMSs shall be compliant with the FDOT Supplemental Specification 781-3.

The DMSs shall be a walk-in type full-matrix display as described in FDOT Supplemental Specification 781-3.1.3.2.

The brightness and color of each pixel shall be uniform over the sign's entire face from 200 to 1,100 feet in all lighting conditions.

All DMS, except the northbound DMS prior to the I-275 interchange, shall be mounted on cantilever structures. The left edge of the DMS housing shall be placed over the left lane line of the right most through lane. The northbound DMS prior to the I-275 interchange shall be mounted on a half-span truss structure. This DMS shall be mounted so that it is centered over the through lanes.

*Cantilever Support Structure:* The sign support structure shall be furnished and installed as described in FDOT Standard Specification 700. The sign structure includes the furnishing and installation of all structures, foundation installations, and all ancillary items required to furnish and install an approved sign structure. The Design-Build Firm shall design the Cantilever Sign Structure according to the FDOT Structures Manual. The Cantilever Sign Structure shall comply with the FDOT Design Standards Index No. 11310, 18302 and 18303.

The locations of the DMSs in the Conceptual Device Layout are intended to provide sufficient advance notification for drivers to divert to other routes. The locations were selected to minimize impacts upon existing signage. Each DMS shall be located outside the clear recovery area without the installation of guardrail, as defined in the *Roadway and Traffic Design Standards*. Any request to vary the location of a DMS will include the location and message of all adjacent signs.

The height of the DMS and structure shall provide a minimum clearance of 19.5 feet from the highest portion of the roadway that the sign spans for the existing conditions and known proposed improvements.

The DMS structure shall include a catwalk for access to the inside of the sign from the edge of the roadway. The catwalk shall be designed as shown in FDOT Design Standards Index No. 18302.

The DMS sign and enclosure shall be designed in accordance with the FDOT *Plans Preparation Manual* (PPM), Volume I, and designed in accordance with the American Association of State Highway and Transportation Officials (AASHTO) *Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals* (current adopted edition) (25-year reoccurrence). Sign performance shall not be impaired due to continuous vibration caused by wind, traffic, or other factors. This includes the visibility and legibility of the display.

The DMS housing shall be designed and constructed to comply with the fatigue-resistance requirements of NCHRP Report 412, *Fatigue-Resistant Design of Cantilevered Signal, Sign, and Light Supports*. The Design-Build Firm shall construct the DMS structure foundation in accordance with the FDOT Standard Specification Section 455. The foundations shall be drilled shafts, except in unusual circumstances, and shall be designed according to the FDOT's *Structures Design Guidelines for Load and Resistance Factor Design* (current edition), or by using Brom's procedure and hand calculations. Both of these methods consider lateral loading of the shafts, which is a primary concern in foundation design.

The supplied DMS shall be compatible with the SunGuide® Software System and shall be listed on the APL prior to installation.

## **6.2 Functional Requirements**

All materials furnished, assembled, fabricated, and installed shall be new corrosion-resistant products obtained from the manufacturer or reseller, and approved by the Engineer. All details and device functions shall be thoroughly inspected and tested by the Engineer before system acceptance. Failure to meet all details and device functions and all applicable standards, MTRs, and requirements, shall be grounds for rejection of the equipment.

The equipment to be furnished at each DMS field site shall include, but not be limited to:

- LED DMS (i.e., the face within the housing)
- Sign controllers
- DMS support structures
- DMS mounting brackets and hardware
- DMS walkway platforms with permanent safety rails, and mounting brackets and hardware
- All necessary cabling
- Required network communication devices
- Required grounding and transient voltage protection devices
- Ground-mounted control boxes on concrete pads
- UPS
- All ancillary items required to furnish a fully operating DMS

The DMS shall be programmed to display 25 characters on each of the 3 lines of text.

The sign status request command shall provide a report that includes information on the message currently being displayed. The report shall include information on the number of pixels on, display parameters, remaining display time, fonts used, and character spacing, as well as the sign number, location, and identification information. The report shall also contain details regarding the sign's appearance (e.g., lit, blank, or neutral) and the status of the pixels, fans, internal temperature sensors, ambient temperature sensors, and power supplies.

### **6.2.1 Sign Controller Communication Interface**

The Sign Controller Communication Interface shall comply with the requirements of the FDOT Supplemental Specification 781-3.1.11.

### **6.2.2 Operational Safety**

The DMS equipment shall meet all of the requirements in Section 2.1.4 of the NEMA TS-1 standard regarding primary input power interruption.

The DMS equipment shall meet all of the requirements in Section 2.1.6 of the NEMA TS-1 standard regarding power service transients.

In the event of a communication link failure with the SWIFT Center and/or STMC central computer, the sign controller shall set the sign to neutral after a user-defined number of minutes unless communication has been restored within the defined period. This function shall apply only when the sign controller is in the master control mode.

### **6.3 Construction Requirements**

#### **6.3.1 General**

No DMS installation shall be allowed prior to the availability of power. Each DMS shall be fully functional under local control within 72 hours of sign mounting.

The equipment design and construction shall utilize the latest available techniques with a minimum number of different parts, subassemblies, circuits, cards, and modules to maximize standardization and commonality. The equipment shall be designed for ease of maintenance. All component parts shall be readily accessible for inspection and maintenance. Test points shall be provided and labeled for checking essential voltages. All external connections shall be with connectors. The connectors shall be keyed to preclude improper hookups.

All markings and identifications shall be silk-screened and sealed or otherwise indelible using material and methods approved by the Engineer.

The DMS sign structure shall be constructed according to the FDOT's *Standard Specifications for Road and Bridge Construction, Supplemental Specifications, and/or Special Provisions and Structures Standard Drawings*.

#### **6.3.2 Deliverables**

The Design-Build Firm shall provide software and documentation for the SWIFT Center central computer software system and its components. These shall include, but are not limited to:

- All documentation concerning the sign controller communication protocol, including information needed to define the interface design, software codes, message definitions, and message sequences for DMS control and feedback
- Welding reports
- One complete copy of the manufacturer's documentation for plug-in circuit cards used in the microcomputer chassis
- DMS software for configuration management and diagnostic troubleshooting

### **6.4 Training and Manual Requirements**

Operational and maintenance training for the entire DMS system, including UPS, shall be provided to designated personnel during installation, testing, and debugging. This training shall be provided through practical demonstrations, seminars, and other related technical procedures. Training shall be limited to include up to 10 personnel, and shall be provided at a time and location approved by the Engineer. The training shall include, but not be limited to:

- Hands-on operation of all sign control hardware in the classroom and field
- Explanation of all system commands, their functions, and usages
- Insertion of data
- Required preventative maintenance procedures
- Servicing procedures
- System troubleshooting or problem identification procedures
- A minimum of 40 hours of instruction for the system's operational and maintenance procedures. The Design-Build Firm shall submit a training agenda and one complete set of training materials (i.e., the manual and accompanying schematics), along with the proposed instructor's qualifications, to the Engineer for approval at least 60 calendar days before the training is scheduled to begin. The Engineer shall review and approve the training material, or request changes

- The training shall be conducted after the completion of all system integration tests. The Engineer shall approve the training schedule time and location. All training will be video recorded by the Design-Build Firm and the discs provided to the FDOT for later use.

#### **6.4.1 Final DMS System Acceptance**

The Final DMS System Acceptance procedure shall start after all the tests defined in FDOT Supplemental Specification 781-3.8 have been successfully performed. Final system acceptance shall be defined as the time when all work and materials described in the plans have been furnished and completely installed by the Design-Build Firm; all parts of the work have been approved and accepted by the Engineer.

#### **6.4.2 Shop Drawings**

The DMS system supplier shall submit shop drawings, as required by Section 5-1.4 of the Standard Specifications for Road and Bridge Construction for approval by the Engineer before fabrication. Each individual DMS shall be delivered to the site with two sets of as-built drawings. The Engineer shall verify that the drawings correspond with the preconstruction shop drawings. Both types of drawings shall include, but not be limited to, the sign structural members and attachment support details.

#### **6.4.3 Manufacturer Qualification**

The Traffic Engineering Research Laboratory (TERL) shall certify the DMSs before submission for approval. In addition, the DMS manufacturer shall meet the following requirements:

*Manufacturer Reference:* The DMS system manufacturer shall submit three state department of transportation (DOT) references in which the manufacturer has furnished and is successfully operating multiple walk-in type enclosure LED sign systems of three lines of 18-inch high characters, 25 characters per line full matrix signs on state or interstate highways.

These DMS systems shall be permanently mounted on overhead sign structures and shall be supplied by the manufacturer under the current corporate name for a period of no less than five years. Reference data shall include the manufacturer's corporate name and address, and the current contact's name and telephone number. This information shall be provided prior to project submittal. Failure to furnish the above references shall be sufficient reason for rejection of the manufacturer's equipment. The Department reserves the right to contact additional references. Any poor or unsatisfactory reference, as determined by the Department in its sole and absolute discretion, may cause the manufacturer to be rejected.

The manufacturer shall have been engaged in the design and manufacture of DMS systems, DMS electronics, and control systems for a minimum of 10 years, and shall demonstrate to the Department a minimum of 100 LED DMSs that are contained in walk-in housings and that are currently in operation.

### **6.5 Warranty**

Equipment, structures and parts furnished under these MTRs shall be guaranteed to perform according to the manufacturer's published requirements. The equipment and parts furnished for the DMS system shall be new, of the latest model, and fabricated under high quality standards.

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, materials, assembly, fabrication and workmanship for the minimum warranty duration specified for each equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786, as applicable.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## 7.0 FIBER OPTIC COMMUNICATIONS INFRASTRUCTURE

### 7.1 Description

The fiber optic infrastructure shall include the items listed below to provide an Ethernet network infrastructure over single mode fiber optic transmission media between the field devices, the SWIFT Center and the Sarasota-Manatee STMC.

These fiber optic items include, but are not limited to:

- Conduit and locate system
- Fiber optic cable plant
- Pull boxes
- Splice boxes
- Splice enclosures
- Splice trays

#### 7.1.1 Conduit

The Design-Build Firm shall install two 1.25-inch SDR 11 HDPE conduits for underground locations. The fiber optic cable shall be housed in one of these 1.25-inch conduits. The other 1.25-inch conduit shall be left empty as a spare for use in the future. No other cable shall occupy the same conduit as the fiber optic cable and the Design-Build Firm shall provide additional conduits for these other cables as necessary. The conduit shall comply with the FDOT Supplemental Specification Section 783-2. The Design-Build Firm shall install a minimum 2-inch conduit(s) for electrical power. These conduits shall be installed eight feet inside the right-of-way fence and shall follow the fence line. Fiber optic cable markers shall be placed ten feet inside the right-of-way fence line and adjacent to each pull box and splice box.

When installation of a conduit requires directional boring, the same HDPE conduit shall be used without any sleeve. The directional bore should also include provisions of the locate wire.

When installation of a conduit requires jacking under paved surfaces, an intermediate metal conduit shall be used as sleeve for the underground HDPE conduit.

When installation of conduit requires bridge mounting, conduit shall be 4" diameter bullet resistant fiberglass (BRFG) outerduct conduit with two 1.25-inch SDR 11 inner ducts. A separate 2" rigid steel conduit shall be used for electrical cable where necessary. Both the 4" and 2" conduits shall be attached to the outside wall of the bridge. A licensed structural engineer shall design the attachment to existing bridges. There shall be no overstress to any structural element of the bridge as a result of any new attachment. Approval of the District Bridge Maintenance Engineer is required for any new bridge attachment. Below is a list of bridges and canals with potential for bridge-mounted conduits.

Bridge No.	Bridge Name
130066	Braden River
130102	Salt Marsh
130104	Jeffrey Dale Young Bridge (Manatee River)
130076	CSX Railroad
170132	Big Slough Canal
170128	Myakka River
170108	Salt Creek

For under water installations, the HDPE inner duct shall be placed inside HDPE outer duct. All other

waterway crossings within the limits of this project shall be by directional bore and not bridge attachment.

### 7.1.2 Fiber Optic Cable

The fiber optic cable system components shall be compliant with the FDOT Standard Specification 783-1.

Fiber optic cable shall be used in the I-75 FMS network infrastructure to provide data and device control and communications between the SWIFT Center, the Sarasota-Manatee STMC, other transportation management centers (TMCs), ITS devices, and other identified stakeholder facilities.

Fiber optic cable sizes shall be:

- *Main Route Cable:*  
The Design-Build Firm shall provide 96-strand single mode fiber optic cable along the northbound side of I-75 starting at the existing splice box approximately one mile north of the Charlotte/Desoto/Sarasota County line to a planned splice box at the northbound off ramp for the intersection of I-275 and I-75.
- *STMC Interconnect Cable:*  
There is an existing 48-strand single mode fiber optic cable installed by others from a pull box at the intersection of SR-70 and I-75 to the equipment room adjacent to the control room at the Sarasota-Manatee STMC. The Design-Build Firm shall use this cable to connect the devices installed on I-75 and the STMC. The Engineer will provide the final (as installed) Optical Time-Domain Reflectometer (OTDR) test results to the Design-Build Firm. The Design-Build Firm shall test this cable and compare the new results to the test data provided by the Engineer. Repairs to this cable if necessary will be accomplished by FDOT. The Design-Build Firm shall allow 90 days in its construction schedule for any required repairs by the FDOT before termination of this cable begins.
- *Drop Cables:*  
The Design-Build Firm shall provide 12-strand single mode pre-terminated cable into cabinets and devices located on either the northbound or the southbound side of I-75.

The splicing of the fiber optic cable plant shall include the assignment of:

- One buffer tube for core switch to hub switch communications
- Two buffer tubes for hub switch to local switch communications
- One buffer tube for the Statewide WAN project

The remaining four buffer tubes are reserved as spare for future use. Fiber optic splices shall provide a continuous optical path for the transmission of optical pulses from one optical fiber length to another. All fiber optic splices shall consist of fusion-spliced optical fiber and the installation of a splice enclosure around the cable.

The Design-Build Firm shall furnish and install a locate system compliant with the FDOT Supplemental Specification 783-2. Locate wire shall not be installed in the same conduit as fiber optic cable. The Design-Build Firm shall furnish electronic box markers for all splice vaults and pull boxes. The Design-Build Firm shall provide three (3) electronic box marker locators as part of this project.

The Design-Build Firm shall furnish and install fiber optic pull boxes. Pull boxes shall be compliant with the FDOT Supplemental Specification 783-3. Fiber optic pull boxes shall not house any other cable other than fiber optic cable.

The Design-Build Firm shall furnish and install splice vaults. Splice vaults shall be compliant with the FDOT Supplemental Specification 783-3. Fiber optic splice vaults shall not house any other cable other than fiber optic cable.

All pull box and splice box covers shall be stamped with "FDOT FIBER OPTIC CABLE". All pull boxes shall be stackable and all splice vaults shall have manholes that are extendable.

The Design-Build Firm shall furnish and install splice enclosures. Splice enclosures shall be compliant with the FDOT Supplemental Specification 783-3 and 783-1.2.2.1.

## **7.2 Design Requirements**

The installation of the fiber optic communications network shall meet the minimum required depth of the conduit system as outlined in the Specifications and Standard Indexes. Additionally, it shall have a minimum of 10 feet of cover when installed in the median of the highway. The fiber optic trunk cable shall be placed at 8 feet from the existing limited access right of way fence. It shall be directional bored under wetlands and drainage canals and may be attached to bridges as previously stated. The Design-Build Firm shall use the orange buffer for all device drops and shall coordinate with FDOT for all other fiber allocations.

### **7.2.1 Fiber Optic Pull Boxes**

The fiber optic pull boxes shall comply with the FDOT Supplemental Specification 783-3.2.2. The Design-Build firm shall avoid placement of fiber optic pull boxes in wetland areas.

### **7.2.2 Fiber Optic Splice Boxes**

The fiber optic splice boxes shall comply with the FDOT Supplemental Specification 783-3.2.3. The Design-Build firm shall avoid placement of fiber optic splice boxes in wetland areas.

### **7.2.3 Fiber Optic Splice Enclosures**

The splice enclosures shall comply with FDOT Supplemental Specification 783-1.2.2.1.

### **7.2.4 Fiber Optic Splice Trays**

The splice trays shall comply with FDOT Supplemental Specification 783-1.2.2.2.

### **7.2.5 Fiber Optic Splices**

It is the Design-Build Firm's responsibility to ensure that all splicing equipment and material, along with the terminating connectors and their associated hardware, comply with FDOT Supplemental Specification 783-1.3.2. The Design-Build Firm shall provide all splice loss measurement information as part of their as-built documentation for review at the start of the Operational Test.

All splice enclosures, organizers, cable end preparation tools, and procedures shall be compatible with the fiber optic cable and approved by the Engineer.

All optical fiber splices shall be contained within a splice enclosure.

### **7.2.6 Fiber Optic Patch Panels**

All patch panels, including pre-terminated and field assembled and terminated, shall comply with FDOT Supplemental Specification 783-1.2.4.

### **7.2.7 Route Markers**

Where the conduit and fiber are placed at 8 feet from the limited access right of way, route markers shall be placed 10 feet from the right of way line at fiber pull box and splice box locations.

### **7.2.8 Electronic Box Markers**

Provide an electronic box marker that is compliant with Supplemental Specification 783-2.2.4.3 in all splice vaults and pull boxes, including fiber optic, electric and multi-conductor boxes.

### **7.3 Performance Requirements**

The Design-Build Firm shall furnish all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance. It is the Design-Build Firm's responsibility to ensure that all fiber optic infrastructure features, functions, and performance measures are met.

All materials furnished, assembled, fabricated, or installed shall be new products obtained from the manufacturer or reseller. The materials, equipment, and components shall be COTS products.

#### **7.3.1 Fiber Optic Jumper Cables**

All fiber optic jumper cables shall comply with the FDOT Supplemental Specification 783-1.2.3.

### **7.4 Material Requirements**

#### **7.4.1 Trunk Cable**

The single mode fiber optic cable shall be compliant with the FDOT Supplemental Specification 783-1.

#### **7.4.2 Drop Cables**

*Optical Fiber:* The optical fiber used in the fiber optic drop cables shall comply with the requirements for the trunk cable except for the size.

*Cable Strength:* The cable strength for fiber optic drop cables shall comply with the requirements for the trunk cable, with the exception of the pulling tension requirement. The fiber optic drop cables shall withstand a pulling tension of 300 pounds.

*Configuration:* The fiber optic drop cable configuration shall comply with the requirements for the trunk cable.

*Ripcord:* The fiber optic drop cable shall contain ripcords as required for the trunk cable.

*Color Coding:* The fiber optic drop cable shall comply with the color coding required for the trunk cable.

*Bend Radius:* The fiber optic drop cable shall meet the minimum bend radius requirements for the trunk cable.

*Temperature:* The fiber optic drop cable shall comply with the shipping, storage, and operating requirements detailed for the trunk cable.

### **7.5 Construction Requirements**

#### **7.5.1 Fiber Optic Cable**

All fiber optic cable shall be installed in approved conduit by either the cable pulling or cable blowing (i.e., air assisted) method.

#### **7.5.2 Fiber Optic Cable Splicing**

The Design-Build Firm shall furnish all labor, tools, equipment, materials, and supplies necessary to splice and terminate fiber optic cable. The Design-Build Firm shall provide all labor and equipment necessary to move inventory out of the designated storage facility and to transport it to the installation location.

All incidental parts necessary to complete the installation, but not specified, shall be provided as necessary to produce a complete and properly operating system. The Design-Build Firm shall provide a

splice plan showing the approximate location and configuration of any splices in the system for approval by the Engineer. The splicing diagram shall include all fibers from cabinet patch panel to the trunk line including all pull and splice vaults.

#### **7.5.3 Route Marker**

The Design-Build Firm shall install Standard Route Markers (SRM) compliant with the FDOT Supplemental Specification 783-2.2.1.1.

The Design-Build Firm shall install Locate Wire and Locate Wire Surge Protection system compliant with the FDOT Supplemental Specification 783-2.2.3.

#### **7.5.4 Fiber Optic Pull Boxes and Splice Boxes**

The Design-Build Firm shall furnish all labor, tools, equipment, materials, and supplies necessary to install pull boxes and splice boxes, the associated covers, racking, steps, and grouting, including dewatering, shoring, backfilling, compaction tamping, and restoration.

All pull boxes and splice boxes shall be installed according to the manufacturer's recommendations and shall comply with the FDOT Supplemental Specification section 783-3.3. Additionally, an electronic box marker to locate pull and splice boxes shall be provided. The Design-Build Firm shall not install any pull box or splice vault on a slope.

Installation of pull boxes and splice boxes, including the placement of hardware and the termination of fiber optic conduit, shall be completed before cable installation.

Before ordering the precast structures, the Design-Build Firm shall verify the required installation depth to ensure that any required extensions or adjustment collars will provide for the required construction tolerances. The Design-Build Firm shall be responsible for furnishing and constructing pull boxes and splice boxes with tops that are flush with the finished grade.

Pull boxes and splice boxes shall be assembled to provide a plumb structure with uniform bearing at all points. Where conduit enters, it shall be mechanically sealed with a neoprene molded duct organizer device. All joints between precast elements shall be sealed with a sealant material according to the manufacturer's recommendations and all penetrations shall be sealed with a no-shrink grout.

In areas where excavation reveals unstable material, such material shall be excavated to a depth of one foot below the structure's bottom and replaced with one foot of washed crushed 0.75-inch grade gravel stone at the excavation base before installing the pull box or the splice box.

All sheeting, bracing, and shoring required for safety shall be installed in compliance with applicable requirements and specifications. Backfill material shall be of suitable stability and shall be placed in one foot layers, each layer being compacted pneumatically. No backfill shall be placed against a structural wall until all connecting structural members are installed, and backfilling and compaction requirements have been met.

Any area where more than one box is installed, the boxes shall be grouped so that a concrete pad can be installed around all adjacent boxes to make a more stable box structure.

Fiber optic conduit shall be terminated and sealed with preinstalled conduit connectors. Conduit connectors shall be factory-installed to accept the type, size, and quantity of conduit or pipe being installed. The Design-Build Firm shall take precautions to ensure that the conduit at the pull box or splice box connections is not damaged during the installation of backfill material.

## **7.6 Testing Requirements**

### **7.6.1 Manufacturer Testing and Certification of Fiber Cable**

The Design-Build Firm shall perform tests complying with the FDOT Supplemental Specification Section 783-1.4.

The Design-Build Firm shall provide the manufacturer's on-reel test results for Engineer's approval before installing the fiber optic cable. These on-reel tests shall include, but not be limited to, end-to-end loss for every fiber strand of the 96 single mode fiber. The manufacturer's on-reel OTDR test results shall clearly show each one of the 12 single mode fiber strands is tested in each one of the 8 buffer tubes.

### **7.6.2 Post-Installation Testing of fiber cable**

The Design-Build Firm shall perform the following post-installation tests:

- All OTDR testing shall comply with the *EIA/TIA-455-61* standard.
- All fibers from both cable end points shall be tested with an OTDR. Fibers that are not terminated at installation shall be tested using a bare fiber adapter after the splice enclosures and access points are closed to check for macrobending problems. Tests shall be performed at both 1310 nm and 1550 nm.
- The loss value of the pigtail connector at each termination panel and its associated splice shall not exceed 0.5 dB. For values greater than 0.5 dB, the splice shall be broken and respliced until an acceptable loss value is achieved and/or the pigtail connector is repaired or replaced.
- Any rejected cable shall be removed and replaced at the Design-Build Firm's expense. The Design-Build Firm shall conduct the test again on any cable segment that is replaced at no additional cost to the Department. The cable shall be rejected if any fiber strand fails the bi-directional end-to-end attenuation test.
- No active devices shall be connected for this test and all fiber optic connectors shall be capped.

### **7.6.3 Route Marker System Testing and Certification**

The Design-Build Firm shall perform tests complying with FDOT Supplemental Specification Section 783-2.4.

### **7.6.4 Fiber Pull Box and Splice Box Testing and Certification**

The Design-Build Firm shall perform tests complying with FDOT Supplemental Specification Section 783-3.4.

### **7.6.5 Fiber Optic Pull Box and Splice Box Manufacturer Testing and Certification**

The Engineer reserves the right to require certifications from the manufacturer for materials and equipment that may not require formal testing to ensure compliance, and to require testing on questionable materials or equipment at no additional cost to the Department.

## **7.7 Training and Manual Requirements**

The Design-Build Firm shall conduct a minimum of 40 hours of training for up to 10 representatives designated by the Engineer on procedures of basic installation, splicing, terminating, testing of the fiber optic cable, maintenance and typical failures and failure resolution for the fiber. The training shall include the use of basic test instruments and a fusion splicing machine, splice closures, cleaning agents and other care products, connectors, fiber distribution panels, drop cables, and any other applicable element used in the project.

The goal of the training is to leave the attendee with a basic understanding of fiber optics, typical test instruments including an OTDR and power meter and source, an understanding of typical fixes and hazards associated with fiber optic transmissions, and basic theory of fiber optic transmission. The Design-Build Firm shall submit to the Engineer for approval a draft training plan and course content.

Once approved, the Design-Build Firm shall supply 15 copies of the training material for distribution to the attendees.

### **7.8 Warranty**

The Design-Build Firm shall provide a manufacturer's warranty against all defects and/or failure in design, materials and workmanship for the minimum warranty duration specified for each equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786, as applicable.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## **8.0 FIELD CABINETS**

### **8.1 Description**

The Design-Build Firm shall design, furnish and install all field cabinets to house any combination of the following communications equipment or interface equipment to the following field devices:

- UPS
- Transient Voltage Surge Suppressors (TVSS), grounding and bonding
- CCTV camera assembly
- DMS assembly
- Ethernet edge switches
- Ethernet aggregate switches (dependent on design)
- Ethernet hub switches
- MPEG-2 encoders
- HAR assembly
- RWIS assembly
- Non-intrusive MVDS assembly

The Design-Build Firm shall install the above system equipment within pole- or base-mounted, lockable weatherproof cabinets. Cabinets shall protect those electrical and electronic devices from rain, dust, dirt, and other harmful elements of nature. The cabinets shall include:

- Lightning protection for all devices installed at the site
- Interior cabinet lighting
- #2A Corbin lock with 2 keys for each lock
- Re-usable metal air filters
- UPS
- Grounding and bonding
- Concrete service pad

All field cabinet devices shall have grounding and surge suppression compliant with the FDOT Supplemental Specification Section 785-2. The Design-Build Firm shall utilize full size field cabinets, type 336 or larger, at all device sites. The Department will not allow the use of equipment enclosures in lieu of a full size cabinet.

### **8.2 Requirements**

All field cabinets shall be compliant with the FDOT Supplemental Specification 785-4.

The Design-Build Firm shall specify the size of the cabinet for all the equipment installed within the cabinet at the particular location. The cabinets shall be sized to space the equipment appropriately to ensure easy access to the proposed equipment.

Each cabinet shall contain four duplex 120 volts alternating current (VAC) industrial-grade receptacles. Two of these receptacles shall be ground fault interrupter circuit (GFIC) compliant units used for field maintenance purposes only. The maintenance receptacles shall be orange in color and marked GFIC. Two standard duplex receptacles shall be used for auxiliary devices.

Each cabinet shall be provided with a one-unit rack-mount power distribution unit containing at least eight outlets, and at least one outlet shall be accessible on the front panel. The rack-mount power distribution unit shall be equipped with a master on/off switch and a resettable 15 amp circuit breaker.

Each cabinet shall be equipped with a contact closure feature that sends an alert via the network connections to the SWIFT Center and/or the Sarasota-Manatee STMC when the door is opened and closed.

Each cabinet shall be equipped with an aluminum pull-out drawer mounted in the rack assembly. The pull-out drawer shall have ball bearing telescoping guides to allow full extension from the rack assembly. When extended, the storage compartment shall open to provide storage space for cabinet documentation and other miscellaneous items. The pull-out drawer shall be provided with a recessed handle and be of adequate construction to support a weight of 20 pounds without sagging when extended. The top of the storage compartment shall be hinged aluminum. The height of the storage compartment shall not exceed 3.5 inches (two-units). The pull-out drawer shall be placed at a height within the cabinet to allow a person to use a laptop supported by the drawer.

Each cabinet shall be equipped with a metal, reusable filter per Supplemental Specification 785-4.2.8.

Each cabinet shall contain a rack-mountable UPS that meets the requirements specified in this MTR.

Each UPS unit shall include a minimum of six 120VAC outlets. The UPS shall meet the following material requirements:

- Rack mounted in 19-inch EIA rack in field cabinets
- Internal sealed Absorbent Glass Mat (AGM) type, maintenance free batteries
- 10/100 BaseT Ethernet interface port
- Status lights: power on, power source, and overload
- Alarms: audible and remote notification
- Manual power on/off switch

The UPS shall have a terminal for connecting the UPS to a TVSS surge protection device. Each UPS unit shall be configured for remote monitoring from the SWIFT Center and/or the Sarasota-Manatee STMC. The UPS remote monitoring software shall perform the following functions:

- Data logging
- Event logging
- Fault notification
- Unattended system shutdown
- Manage all network UPS units
- Operating system shutdown
- Power event summary
- Recommended actions
- Risk assessment summary
- Run command file
- System event log integration

The UPS shall meet the following performance requirements:

- Size each unit to operate all devices in the cabinet for a minimum duration specified in section 8.3 of this MTR.
- Output voltage distortion: Less than 5 percent
- Nominal input voltage:120VAC
- Nominal output voltage:120VAC
- Input frequency: 50/60 Hz  $\pm$ 3Hz, auto-sensing
- Output frequency (sync to mains): 57-63 Hz for 60 Hz nominal frequency
- Waveform type: Sine wave
- Operating temperature: -30°F -165°F

- Operating relative humidity: 95 percent
- Storage temperature: -40°F -168°F
- Storage relative humidity: 95 percent
- Noise filtering: Full time multi-pole noise filtering shall meet 0.3% IEEE surge let-through; zero clamping response time shall meet Underwriters Laboratory (UL) 1449
- Management: Via a Web graphical user interface (GUI), SNMP and VT100 compatible terminal software (Hyper-terminal)

The components such as surge suppressors and power distribution shall operate properly and meet the ambient temperature range, relative humidity, applied power, shock, and vibration range of NEMA TS-2.

Alternating current (AC) isolation shall be provided within the cabinet. All cabinets shall be configured to accept 120 VAC from the utility. Cabinets shall be configured with the following minimum number of breakers and outlets:

- Two 15 amp branch circuit breakers in cabinets that are provided with 120 or 120/240 VAC power. One breaker shall feed the GFIC duplex outlet. The second breaker shall feed the other devices in the cabinet.
- Outlets shall be provided for each piece of equipment plus 2 spare outlets.

The circuit breakers shall be UL listed and have an interrupt capacity of 5,000 amperes and insulation resistance of 100 Mega ohms at 500 volts direct current (VDC). The power distribution blocks shall be suitable for use as power feed and junction points for two- and three-wire circuits. The AC neutral and equipment ground wiring and terminal blocks shall be isolated from the line wiring by an insulation resistance of at least 10 Mega ohms when measured at the AC neutral.

The Design-Build Firm shall provide all patch cables for connecting equipment furnished and installed according to these MTRs. These patch cables shall include all necessary data (Category 6 and single mode fiber optic cables) and video (Composite, S-Video, Component Video, HDMI) cables. All cabinet wiring shall be tagged and identified by the use of insulated pre-printed sleeves. The wire markers shall identify the cable in plain words with sufficient details without abbreviations or codes.

The Design-Build Firm shall furnish all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance. All materials furnished, assembled, fabricated, or installed shall be new products obtained from the manufacturer or reseller. The materials, equipment, and components shall be COTS products.

In addition, all cabinets shall be equipped with:

- A 10-inch x 2-inch x 1/4-inch copper grounding buss with mounting holes
- 120 VAC power supply
- Fiber optic termination panel
- TVSS units

The location of the cabinets shall be:

- Outside the clear zone or behind guardrail; guardrail shall not be installed solely to protect cabinets
- Convenient and accessible for maintenance personnel
- Not in conflict with known future widening projects
- Convenient to power sources and field devices
- Pole-mounted cabinet at each CCTV camera location, placed so the cabinet is not directly under the CCTV camera
- Pole-mounted cabinet at each MVDS location

- Ground-mounted at each DMS location, placed so a technician can view the sign message while working in the cabinet
- Not located in low lying/wet areas.
- Not on a slope or where there is a drop off.

### **8.3 Functional Requirements**

#### **8.3.1 CCTV Camera Cabinet**

Any cabinet serving a CCTV camera shall house, at a minimum, the following items:

- Video encoder
- Ethernet switch
- Fiber optic termination
- UPS with sufficient capacity to hold the site's electrical load (including the CCTV camera) for four hours

The CCTV camera cabinet shall be interconnected to the CCTV camera assembly using a composite cable carrying the video, serial data, and power.

#### **8.3.2 DMS Cabinet**

Any cabinet serving a DMS shall house, at a minimum, the following items:

- DMS controller
- Ethernet switch
- Power-on indicators
- Waterproof local/remote switches and LED indicators
- Communication interface devices
- UPS with sufficient capacity to continue providing communications to the sign and DMS messages for two hours
- EIA-232 cables a minimum of four feet long to connect laptop computers

The power-on indicator shall indicate when the display system interface circuits are energized.

The Design-Build Firm shall be responsible for all connections between the sign and field cabinet, and for any required wiring harnesses and connectors.

#### **8.3.3 Ethernet Hub Equipment Shelter**

Ethernet hub equipment shelter shall comply with supplemental specification 785-5 and shall contain:

- Dual HVAC redundant system for a climate controlled environment
- UPS with sufficient capacity to hold the site's electrical load, less HVAC, for four hours

#### **8.3.4 Non-Intrusive MVDS Cabinet**

Any cabinet serving a non-intrusive MVDS shall house, at a minimum, the following items:

- Power and signal TVSS
- Single port terminal server
- UPS with sufficient capacity to hold the site's electrical load for four hours
- Ethernet edge switch

The non-intrusive MVDS shall connect to the communications network through an EIA 232/422/485 connection on the terminal server and then to a locally available Ethernet switch. For those units with an Ethernet port, connect it to the available Ethernet switch without use of a terminal server.

#### **8.3.5 RWIS Cabinet**

Any cabinet serving a RWIS shall house, at a minimum, the following items:

- Ethernet edge switch
- UPS with sufficient capacity to hold the site's electrical load for four hours
- Remote processing unit
- Local control panel
- Environmental sensor support equipment

The RWIS shall connect to the communications network through an EIA 232/422 connection on the terminal server and then to a locally available Ethernet switch.

### **8.3.6 HAR Cabinet**

Any cabinet serving a HAR transmitter site shall house, at a minimum, the following items:

- Ethernet edge switch
- UPS with sufficient capacity to hold the site's electrical load for three days

The HAR shall connect to the communications network via a locally available Ethernet switch.

## **8.4 Applicable Standards**

All Category 5 unshielded twisted pair (UTP)/shielded twisted pair (STP) network cables shall comply with the *EIA/TIA-568-A* standard.

Each cabinet shall be ISO 9001 certified at the time of bid letting.

## **8.5 Construction Requirements**

The Design-Build Firm shall furnish all tools, equipment, materials, supplies, and manufactured hardware, and shall perform all operations and equipment integration necessary to provide a complete, fully operational field cabinet. All components shall be securely mounted inside the cabinet. For cabinets housing the same types of equipment, they shall be consistent; all cabinets shall be configured the same including, but not limited to, placement of the equipment inside the cabinet, equipment type and model, wiring, labeling, and mounting technique. The placement and mounting of equipment and cabling shall not interfere with general maintenance activities, testing, and future replacement of failed devices or removal of the cabinet from the foundation, and/or removal of working equipment or other cabinet contents.

The Design-Build Firm shall use stranded copper for all conductors, including those in jacketed cables. Neatly arrange all wiring, firmly lace or bundle it, and mechanically secure the wiring without the use of adhesive fasteners. Route and secure all wiring and cabling to avoid sharp edges and to avoid conflicts with other equipment or cabling. Terminate all wiring on a terminal block, strip, buss bar, device clamp, lug, or connector; do not splice any wiring. Label all wiring, cables, terminal strips, patch panels and distribution blocks. Use strain reliefs for all cabling with connectors, all cabling entering knockouts or ports at the equipment, and where appropriate.

Fasten all components of the cabinet assembly to be mounted on cabinet side panels with hex-head or Phillips-head machine screws. Install the screws into tapped and threaded holes in the panels. The components include, but are not limited to, terminal blocks, bussbars, panel, socket or DIN mounted TVSS, circuit breakers, accessory and equipment outlets, and DC power supply chassis. Each cabinet mounted UPS unit shall be configured for remote monitoring from the SWIFT Center and the Sarasota-Manatee STMC.

Fasten all other cabinet components with hex-head or Phillips-head machine screws installed with nuts (with locking washer or insert) or into tapped and threaded holes. Fasten stud-mounted components to a

mounting bracket providing complete access to the studs and mounting nuts. All fastener heads and nuts (when used) shall be fully accessible within a complete cabinet assembly, and any component shall be removable without requiring removal of other components, panels or mounting rails. Do not use self-tapping or self-threading fasteners.

The Design-Build Firm shall install a concrete service pad at each cabinet location. For pole-mounted cabinets, the service pad shall be installed flush with the pole. For base-mounted cabinets, the service pad shall be installed flush with the cabinet face. The service pad shall measure 30 inches from the face of the cabinet by 36 inches wide. The service pad shall provide a level surface for a technician to access the cabinet and have a slope of 1/4 to 1 inch for drainage.

### **8.6 Document Requirements**

All cabinet as-built drawings shall be submitted to the Engineer for approval prior to installation in the cabinet. All markings and identifications shall be silk screened on the panel and sealed with a clear sealer, an acrylic, or a material approved by the Engineer.

### **8.7 Warranty**

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, materials, assembly, fabrication and workmanship for the minimum warranty duration specified for each equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786, as applicable.

The UPS units shall carry a manufacturer's warranty of two years.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## **9.0 GROUNDING AND TRANSIENT SURGE PROTECTION**

### **9.1 Description**

The Design-Build Firm shall provide a system to protect field devices and electronic equipment from lightning and voltage surges using National Electrical Code (NEC) & Transient Voltage Surge Suppressor (TVSS) technology and standards.

Grounding and TVSS shall comply with FDOT Supplemental Specification Section 785-2.

### **9.2 Functional Requirements**

All TVSS devices shall have an ambient operating temperature of -40° F to 165° F with 95 percent noncondensing relative humidity.

#### **9.2.1 Device Data/Video Supply and Line Side**

The Low-voltage TVSS devices shall comply with the FDOT Supplemental Specification Section 785-2.4.4.

### **9.3 Warranty**

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, assembly, fabrication, materials and workmanship for the minimum warranty duration specified for each equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786, as applicable.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## **10.0 NON-INTRUSIVE MICROWAVE VEHICLE DETECTION SYSTEM**

### **10.1 Description**

The non-intrusive microwave vehicle detection system (MVDS) is a non-invasive detection system installed above ground on the roadside (i.e., side-fire-mounted). The detection system uses a low-power microwave radar beam to measure vehicle presence and generate volume, occupancy, and speed data. The system shall transmit data in serial format using the EIA-232 communications port or an IP interface. The connection to the ITS network shall be through a device server.

### **10.2 Design Requirements**

The new MVDS assemblies shall be installed at the locations as determined by the Design-Build Firm. The minimum spacing for MVDS placement is:

- At each off ramp location, beyond the gore, where it can detect both the exiting and mainline traffic
- Every 1 mile except within 2 miles of an interchange
- Every 1/2 mile within 2 miles of an interchange

In some locations, it may be necessary to place two detectors to produce accurate measurements for both directions of travel and/or the exiting and mainline traffic at an interchange.

The location of each MVDS shall consider the existing and proposed geometry of I-75 and its ramps. There is proposed construction of road widening and noise barrier walls that must be considered in the placement of the detectors. The setback and mounting height must follow the manufacturer's recommended criteria in order to meet the performance requirements described in these MTRs. Each lane of the detected ramp and mainline must be an individual detection zone.

MVDSs shall have both EIA-232 and Ethernet access capability.

### **10.3 Functional Requirements**

The MVDS equipment shall comply with all applicable sections of the FDOT Supplemental Specification 786.

The configuration and control software for the MVDS shall be compatible with the SunGuide® Software System.

Maintenance and construction of an installed assembly shall not require lane closures.

The Design-Build Firm shall provide software updates at no cost to the FDOT during the warranty period. It shall be possible to use a laptop computer with an operating system compatible with the SunGuide® software for detector assembly, setup, calibration, diagnosis, and data retrieval.

### **10.4 Performance Requirements**

#### **10.4.1 Environmental**

The detector shall not be sensitive to temperature variations and shall operate across the temperature range of -30° F to 165° F without performance variations. The sensor shall not rely on temperature compensation circuitry to prevent abnormal operation. The assembly, operating continuously in its application, shall have a designed mean time between failures (MTBF) of 10 years, or 87,600 hours.

#### **10.4.2 Detection**

At a 9600-baud rate, the detector shall be capable of reporting full volume, occupancy, and speed data for a minimum of eight travel lanes. The detector shall meet the overall accuracy requirements specified under all weather and traffic conditions experienced in the detection site area. The unit shall not be adversely affected by varied weather conditions, such as rain, fog, or winds.

#### **10.5 Material Requirements**

The Design-Build Firm shall furnish all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance. It is the Design-Build Firm's responsibility to ensure that all required detection assembly features, functions, and performance measures are met.

All materials furnished, assembled, fabricated, or installed shall be new products obtained from the manufacturer or reseller. The materials, equipment, and components shall be COTS products.

The detector shall include the required assembly installation hardware at each individual detection site. The mounting and installation of the assembly shall ensure that detection quality is not degraded due to assembly movement and vibration.

#### **10.6 Construction Requirements**

The Design-Build Firm shall furnish all tools, equipment, materials, supplies, and manufactured hardware, and perform all operations and equipment integration necessary to provide a complete and fully operational system, according to the manufacturer's recommendations and all applicable standards, specifications, and requirements.

A factory-trained and certified representative shall conduct a detailed preconstruction site survey prior to the 90% plans submittal so that the recommended MVDS locations are clearly identified within that submittal. The site survey shall identify the exact location and details of each detection station. The Design-Build Firm shall submit the detailed location information to the Engineer with the 90% plans submittal for approval.

The Design-Build Firm shall prepare shop drawings that detail a complete detection assembly, and all other components to be supplied and constructed. The drawings shall detail the exact location and placement of system components, and shall include installation details for the required cables. All cabling shall be installed according to the manufacturer's recommendations.

Each detector shall be mounted in a side-fire configuration. The detector shall be mounted level from side to side. When collocating the MVDS with a CCTV camera location, the MVDS shall be mounted so the CCTV camera does not conflict when lowering. The Design-Build Firm shall supply the software and a laptop computer to be used for zone calibration.

The Design-Build Firm shall oversee assembly installation on a pole at a height above the road's surface as recommended by the manufacturer. All detection zones shall be contained within the specified elevation angle according to the manufacturer's recommendations and shall be capable of fully detecting all vehicle types in a maximum of eight lanes.

All equipment shall be installed according to the manufacturer's recommendations.

### **10.7 Testing Requirements**

The Design-Build Firm shall perform tests for each MVDS installation as shown in FDOT Supplemental Specification Section 786-5.

The Design-Build Firm shall provide all the required hardware, software, and labor to perform tests for each MVDS installation.

### **10.8 Training and Manual Requirements**

The Design-Build Firm shall be responsible to conduct a minimum of two hours onsite operational instruction for up to 10 representatives designated by the Engineer, for each type of MVDS unit installed. The Design-Build Firm shall provide training and maintenance manuals for each assembly, including detailed specifications and information regarding all installations.

The Design-Build Firm shall provide an inventory of installed assemblies by location and corresponding serial number. The inventory shall include weight and dimension specifications; power consumption information; the operating temperature range and relative humidity specifications; and general maintenance procedures.

The Design-Build Firm shall provide documentation detailing the technical and operational aspects of the completed installation. Documentation shall include device manuals; system diagrams; cabling diagrams; all field-engineering notes specific to each installation; full warranty information and any other documentation required by the Engineer.

### **10.9 Warranty**

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, assembly, fabrication, materials and workmanship for the minimum warranty duration specified for each equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786, as applicable.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## **11.0 ROAD WEATHER INFORMATION SYSTEM**

### **11.1 Description**

The road weather information system (RWIS) shall comply with the FDOT Supplemental Specification 781-5.

### **11.2 Design Requirements**

The RWIS assemblies shall be located as follows:

- As shown on the Conceptual Device Layout
- Outside the clear recovery area
- Final locations shall be determined by Design-Build Firm to maximize accuracy of weather sensors

A six-foot high Type B (chain link) fence to protect the sensors shall enclose the RWIS. The communications cabinets shall be located inside the fence. Each fence shall be equipped with an eight-foot wide locking gate. The fenced enclosure shall measure 12 feet by 12 feet. The Design-Build Firm shall provide at least 4 copies of the key for the locking gate.

The Design-Build Firm shall install a weed barrier to prevent vegetation from growing up around the RWIS within the fence area. Gravel shall be installed on top of the weed barrier.

Type B fence, weed barrier, and gravel shall comply with FDOT Supplemental Specification Sections 785-5.3.6 through 785-5.3.10.

### **11.3 Applicable Standards**

The RWIS shall comply with the standards listed in the FDOT Supplemental Specification Section 781-5.3.

### **11.4 Performance Requirements**

The Design-Build Firm shall provide an appropriate means of conversion for any device that requires a different input source. Each device shall be provided with appropriate surge suppression and grounding-bonding. Power and control devices shall be protected separately.

### **11.5 Material Requirements**

The Design-Build Firm shall furnish all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance. It is the Design-Build Firm's responsibility to ensure that all features, functions, and performance requirements are met.

All materials furnished, assembled, fabricated, or installed shall be new products obtained from the manufacturer or reseller. The materials, equipment, and components shall be COTS products.

#### **11.5.1 Remote Processing Unit (RPU)**

The RPU shall comply with FDOT Supplemental Specification Section 781-5.2.5. The RPU shall be capable of transmitting all collected data to the SWIFT Center and/or Sarasota-Manatee STMC using Ethernet communications over single mode fiber optic cable that transfers data at a minimum rate of 10 Mbps.

RWIS software shall comply with FDOT Supplemental Specification Section 781-5.2.7.

#### **11.5.2 Sensors**

The sensors shall comply with FDOT Supplemental Specification Sections 781-5.2.1 and 781-5.2.2.

#### **11.5.3 ESS**

The Environmental Sensor Station (ESS) shall comply with FDOT Supplemental Specification Sections 781-5.2.3.

#### **11.5.4 Foundation and Pole**

The RWIS foundation and pole shall comply with the FDOT Supplemental Specification Section 781-5.2.9. The poles shall be concrete poles designed to withstand winds of 150 MPH with gusts to 180 MPH.

### **11.6 Construction Requirements**

The Design-Build Firm shall furnish all tools, equipment, materials, supplies, and manufactured hardware, and shall perform all operations and equipment integration necessary to provide a complete, fully operational system.

All equipment shall be installed according to the manufacturer's recommendations or as directed by the Engineer.

### **11.7 Testing Requirements**

The Design-Build Firm shall perform all the tests outlined in the FDOT Supplemental Specification Section 781-5.5.

### **11.8 Training and Manual Requirements**

The Design-Build Firm shall be responsible to conduct a minimum of two days onsite functional, operational, and mechanical training for all aspects of a RWIS and its supporting network communication devices for up to 10 representatives designated by the Engineer, for each type of unit installed.

The Design-Build Firm shall provide a training and maintenance manual for the RWIS assembly, including detailed minimum technical requirements and information for all installed environmental sensor units, and RPUs. The Design-Build Firm shall provide an inventory of installed assemblies by location and corresponding serial number. The manual shall also include weight and dimension specifications; power consumption information; the operating temperature range and relative humidity specifications; and the system's general maintenance procedures.

The Design-Build Firm shall provide documentation detailing the technical and operational aspects of completed installations. Documentation shall include device manuals, system diagrams, cabling diagrams, all field engineering notes specific to each installation, full warranty information, and any other documentation as required by the Engineer.

### **11.9 Warranty**

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, assembly, fabrication, materials and workmanship for the minimum warranty duration specified for each equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786, as applicable.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## **12.0 HIGHWAY ADVISORY RADIO**

### **12.1 Requirements**

The Highway Advisory Radio (HAR) system shall consist of amplitude modulated (AM) transmitter stations, flashing beacon signs, and command and control station equipment. The HAR, including its components and antenna system must be designed in accordance with the HAR manufacturer's recommendations so that it functions as a system and thus optimally. The Design-Build Firm shall detail the site and antenna design in the plans.

The HAR system shall comply with the FDOT Supplemental Specification 781-4 and these MTRs.

The FMS HAR system shall be compatible with the Department's SunGuide® Software system.

The AM transmitter stations shall include the antenna assemblies, power supplies and battery storage system, and all other necessary items to make a fully functioning HAR transmitter system. The antenna assembly shall include a ground counterpoise system. A driven ground rod or group of ground rods is not acceptable.

The Design-Build Firm shall install 10 HAR transmitter stations and 20 flashing beacons as shown on the Conceptual Device Layout. Each transmitter shall be associated with two flashing beacons, except as shown on the Conceptual Layout drawings. The locations of the HAR transmitters in the Conceptual Device Layout were selected to provide full coverage of the corridor without overlapping. The locations of the HAR flashing beacon signs in the Conceptual Device Layout were selected to minimize impacts upon existing signage.

The HAR frequency shall be 1640 MHz, which is already in use within the Charlotte County portion of the FMS. The Design-Build Firm is responsible for the Federal Communication Commission (FCC) licensing of each new HAR transmitter. The Design-Build Firm shall not be granted extra time for delays associated with the FCC licensing.

Each of the HAR transmitters shall work as an independent HAR station announcing its own audio message. The HAR system control software module shall allow the user to dynamically adjust the AM radio transmitter power from 0 to 10 watts in the increments of 0.1 watts. When two adjacent HAR stations are working in independent HAR station mode, the HAR system control software shall be configurable by the user to adjust each HAR station AM radio transmitter power output so that there shall be a silent gap of about ½-mile between the two adjacent HAR transmitter stations.

The SunGuide® Software system does not have the capability of adjusting the output power of the HAR from 0 to 10 watts in the increments of 0.1 watts. The Design-Build Firm shall install HAR manufacturer's software on all SWIFT Center operator workstations and all Sarasota-Manatee STMC workstations to provide this output power adjustment capability.

Each of the HAR transmitters shall synchronize with other HAR transmitters in the system. When these HAR stations are working in synchronized mode, there shall not be any silent gaps and the HAR system shall operate as one seamless system.

The beacons shall include:

- A static sign
- Two flashing lights of 12 inches in diameter
- Two support posts to mount the sign on
- Ethernet over Single Mode Fiber based beacon controller

- UPS with sufficient capacity to hold beacon's electrical load, including the Ethernet edge switch, for three days
- Remote control unit
- All other necessary items to make a fully functioning beacon system with HAR transmitter

The flashing beacons shall comply with the FDOT Supplemental Specification Section 781-4.2.9.

Solar panels shall not be used to charge the back-up batteries, instead the UPS specified in section 6.3.6 shall be used.

The HAR system shall provide IP-based control for operating and managing the complete HAR system.

The HAR stations and beacons shall be located outside the clear zones. Recommended locations for the HAR stations and beacons are shown in the Conceptual Device Layout. The preferred placement of the HAR beacon signs is in advance of the DMS assembly before an interchange.

## **12.2 Construction Requirements**

The HAR system installation shall comply with the FDOT Supplemental Specification Section 781-4.3.

The HAR system shall be integrated into the fiber optic network for a hard-wired connection to the SWIFT Center and the Sarasota-Manatee STMC.

## **12.3 Testing Requirements**

The Design-Build Firm shall test the entire HAR system utilizing the Department's SunGuide® Software system and the vendor software in both the independent operating mode of multiple HAR stations and their associated flashing beacons, and in synchronized mode of multiple HAR stations and their associated flashing beacons from both the SWIFT Center and the Sarasota-Manatee STMC. For testing purposes, it may be necessary for Department staff to ride along the corridor to verify both types of operation. The test results shall be clearly documented and provided to the Engineer. It should be noted that testing of the HAR transmitters is not allowed before the FCC licenses are received.

The Design-Build Firm shall also test the entire HAR system according to the FDOT Supplemental Specifications Section 781-4.4.

## **12.4 Training and Manual Requirements**

The Design-Build Firm shall be responsible to conduct a minimum of two days onsite functional, operational, and mechanical training of the complete HAR system and its supporting network communication devices for up to 10 representatives designated by the Engineer, for each type of unit installed. The Design-Build Firm shall comply with the testing requirements.

The Design-Build Firm shall supply a complete configuration and operations training utilizing Department's SunGuide® Software system. This training shall include both the independent operating mode of multiple HAR stations and their associated flashing beacons and the synchronized mode of multiple HAR stations and their associated flashing beacons.

The Design-Build Firm shall provide a training and operations/maintenance manual for the HAR system assembly, including detailed information for all installed HAR system components, modules, and software. The Design-Build Firm shall provide an inventory of installed assemblies by location and corresponding serial number. The manual shall also include weight and dimension specifications; power

consumption information; the operating temperature range and relative humidity specifications; and the system's general maintenance procedures.

The Design-Build Firm shall provide documentation detailing the technical and operational aspects of completed installations. Documentation shall include device manuals, system diagrams, cabling diagrams, all field engineering notes specific to each installation, full warranty information, and any other documentation as required by the Engineer.

### **12.5 Warranty**

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, assembly, fabrication, materials and workmanship for the complete HAR system including individual components for the minimum warranty duration specified for each equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786, as applicable.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

## **13.0 UTILITIES**

### **13.1 Description**

The Design-Build Firm is responsible to provide power for all of the field devices within the project.

The Design-Build Firm shall arrange and coordinate the installation of power services along the Sarasota and Manatee I-75 FMS Project route.

The Design-Build Firm shall provide full payment to the electric utility for extending the existing power service to provide power to the field devices where needed along the project route.

Power drops shall be designed and installed to comply with the NEC and FDOT Standard Specification 639. In addition to other requirements referenced to herein, electric pull boxes shall be spaced not more than 500 feet apart.

Voltage design drop calculations shall comply with the suggested limits defined in NEC Article 210.19 (A) (1) FPN #4 and NEC Article 215.2 (A)(3) FPN #2. These calculations shall define all service points, circuits emanating from those points, details of all loads on all circuits, the nominal voltage on each circuit, the voltage drop for each link of each circuit, the percent voltage drop for each circuit and the wire size selected for each link of each circuit. These calculations shall include sizing and ratings of all circuit breakers, transformers, fused switches and transfer switches planned for installation. These calculations shall be submitted with the 90% submittal and with each subsequent submittal with all data appropriately updated. An allowance of 9.0 Amps shall be included at the end of the circuit for a convenience outlet.

Where Transformers are used, they shall be provided with +/- 2.5% & +/- 5% voltage taps. These taps shall not be used to fulfill the voltage drop and wire size requirements of this MTR.

Where circuits run both north and south from a power service point, separate circuits, each with its individual circuit breaker, shall be provided. A main disconnect circuit breaker shall be provided at each power service point.

### **13.2 Engine Generator Backup System**

The Department requires an engine generator backup system similar to the one in place within Collier and Lee Counties. The existing backup system powers all DMSs and all communication switches necessary to control and place messages on those DMSs. The object of the engine generator backup system is to provide messages on those DMSs within Sarasota and Manatee Counties when there is no electrical power from the service provider.

#### **13.2.1 Design Requirements**

The Design-Build Firm shall design the system to allow for message posting and the necessary communications to the signs and between the SWIFT Center and the Sarasota-Manatee STMC. The Design-Build Firm shall provide and install diesel-electric generator units at all power service point locations that provide power for a DMS and those locations that provide power for the communications backhaul. The units shall be sized to carry the full electric load fed from that point, plus 20%, for 24 hours. Only one unit will be allowed at any location. The FDOT has standardized on 7.5 KVA, 120/240 VAC 1 phase, 15 KVA 120/240 VAC 1 phase, and 25 KVA 120/240 VAC 1 phase units and effort should be expended to utilize these sizes. Request for variance to these sizes requires approval of the Engineer.

The 25 KVA units shall be designed for permanent installation and the 7.5 KVA and 15 KVA units shall be designed to be temporarily installed.

Each power service point location shall be equipped with a concrete pad, designed to support the generator unit, a lockdown method to secure the unit, a permanently installed electrical transfer switch to transfer the load from commercial to generator unit power, and housing to protect the unit. The 7.5 KVA units shall include a permanently mounted cabinet to protect the unit from theft. The Design-Build Firm is responsible for designing a cabinet that meets the exhaust and air flow requirements of the generators provided so the units do not overheat. The cabinet design shall address the need for ease of installing and removing the 7.5 KVA generators. Each location shall be bonded and grounded as required by the NEC.

Locations served by 7.5 KVA and 15 KVA units shall be equipped with manual transfer switches while locations served by the 25 KVA units shall be equipped with an automatic transfer switch. Transfer switches shall be fused to protect the downstream components.

#### **13.2.2 Remote Monitoring Requirements**

The 25 KVA generator units and associated automatic transfer switches shall be provided with performance monitoring equipment permanently installed that report to and are controlled by the SWIFT Center and the Sarasota-Manatee STMC. This equipment should provide, as a minimum, the following data to the SWIFT Center and/or the STMC as appropriate:

- Status of Commercial Power
- Position of Transfer Switch
- Status of diesel engine
- Diesel engine speed
- Diesel engine coolant temperature
- Diesel engine oil pressure
- Electric generator output voltage
- Electric generator output current

These units shall be remotely programmable to automatically start from 0.5 to 5 minutes after commercial power fails and to assume the electric load within 5 minutes after that. An alarm shall be provided to advise the operator, at the SWIFT center and/or STMC, that commercial power has been restored so that the operator may transfer the load and shut down the unit.

#### **13.2.3 Testing**

The Design-Build Firm shall test the engine generator backup system as a complete system. The test shall last for a minimum of 6 hours and the Design-Build Firm shall monitor the generators to verify that they work as designed. The Design-Build Firm shall coordinate this test with the SWIFT Center Manager and the SWIFT Center IT Manager.

#### **13.2.4 Deliverables**

The Design-Build Firm shall provide copies of the unit operations and maintenance manuals for each unit supplied to the FDOT.

#### **13.2.5 Training**

The Design-Build Firm shall provide training on this equipment. This training shall consist of 2 hours of classroom theory on operations for both operation personnel and maintenance personnel and 6 hours of hands on training in the field for maintenance personnel for up to 10 representatives designated by the Engineer.

### **13.3 Remote Power Management**

The Design-Build Firm shall provide remote power management (RPM) for controlling multiple network devices and services. The RPM shall individually control AC power for up to eight connected devices. Once connected to the network, the RPM shall provide access and control using a standard web browser

and your password. The Design-Build Firm shall supply remote power management in each cabinet servicing a DMS within the Sarasota/Manatee FMS.

The RPM shall provide the following minimum functionalities:

- Eight outlets;
- Network connections via Ethernet;
- Network control/support via HTTP server & SNMP agent TCP/IP;
- Scheduled event control including day of week and specific time start-up and shutdown; and
- Notifications including pagers and network broadcast messages.

### **13.3.1 Testing**

The Design-Build Firm shall test the RPM with each connected device. The Design-Build Firm shall coordinate this test with the SWIFT Center Manager and the SWIFT Center IT Manager.

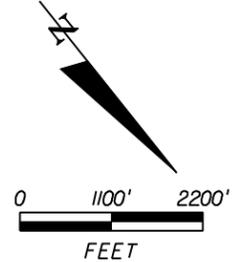
### **13.4 Warranty**

The Design-Build Firm shall provide a manufacturer warranty against all defects and/or failure in design, assembly, fabrication, materials and workmanship for the complete Engine Generator Backup system including individual components for the minimum warranty duration specified for each equipment in the FDOT Supplemental Specifications 780, 781, 782, 783, 784, 785, and 786, as applicable.

The engine generator units shall carry a manufacturer's warranty of two years. The transfer switches and transformers shall carry a manufacturer's warranty of eighteen (18) months.

The warranty period shall not begin until the date that the Department issues written notice of Final Acceptance.

EXISTING HAR  
BEACON SIGN  
(414738-1-52-01)  
BEGIN PROJECT  
(414730-2-52-01)

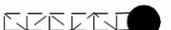


MATCHLINE A



EXIT 179  
TOLEDO BLVD  
North Port  
1 1/4 MILES

**LEGEND:**

-  PROPOSED POLE MOUNTED CABINET
-  PROPOSED HAR TRANSMITTER (HIGHWAY ADVISORY RADIO)
-  POLE
-  PROPOSED DMS (DYNAMIC MESSAGE SIGN) (CANTILEVER)
-  PROPOSED HAR FLASHING BEACON
-  PROPOSED RWIS (ROAD WEATHER INFORMATION SYSTEM)
-  PROPOSED FIBER OPTIC PULL BOX
-  EXISTING FIBER OPTIC PULL BOX
-  EXISTING HAR FLASHING BEACON
-  EXISTING POLE
-  EXISTING SIGN (CANTILEVER)

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION



**GANNETT FLEMING, INC.**  
4350 W. CYPRESS STREET, SUITE 340  
TAMPA, FL 33607  
TELEPHONE: (813) 831-8870  
CA NO.: 5564  
WWW.GFNET.COM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
75	SARASOTA	414730-2-52-01

**PLAN SHEET**

SHEET NO.  
2

























































































FY Maintenance Costs	Warranty Expiration	Comments
	4/29/2011	All highlighted purchased lump sum under DB Contract
	04/29/11	
	04/29/11	
	04/29/11	
	04/29/11	
	04/29/11	
	04/29/11	
	08/11/13	
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