

**CITY OF OCALA
OFFICE OF PUBLIC SERVICES
2100 N.E. 30th Avenue, Bldg. A
Ocala, Florida 34470
Phone: (352) 351-6757
Fax (352) 351-6722**

**INVITATION TO BID # 11-006
FEBRUARY 21, 2011**

Sealed bids will be received by the Office of Public Services, Attn: Judy E. McMinn, 2100 N.E. 30th Avenue, Bldg. A, Ocala, Florida, 34470 up to **2:00 P.M., March 22, 2011** at which time and place all bids will be publicly opened and read aloud. NO EXCEPTIONS TO OPENING TIME WILL BE ALLOWED.

At said place and time, and promptly thereafter, all Bids that have been duly received will be publicly opened and read aloud. Late and/or unsigned bids will be rejected.

The proposed work is generally described as follows:

Intelligent Transportation Systems- GENERAL CONSTRUCTION

- Construction of CCTV Cameras.
- Construction of Scrolling Mylar and Static Signs.
- Construction of Communication Devices.
- Construction of Traffic Monitoring Stations.

The bids shall be for furnishing the following described:

BID NO. ITB #11-006: ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS), PHASE I

All bids shall be addressed to Judy E. McMinn, Administrative Chief/Purchasing Agent, Office of Public Services, 2100 N.E. 30th Avenue, Bldg. A, Ocala, Florida 34470, and plainly marked on the envelope, “ITB #11-006: ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS), PHASE I” to be opened at **2:00 p.m. on March 22, 2011**

Neither **OWNER** nor **CONSULTING ENGINEER** has any responsibility for the accuracy, completeness or sufficiency of any bid documents obtained from any source other than the source indicated in these documents. Obtaining these documents from any other source(s) may result in obtaining incomplete and inaccurate information. Obtaining these documents from any source other than directly from the source listed herein may also result in failure to receive any addenda, corrections, or other revisions to these documents that may be issued.

BIDDERS must be licensed contractors in the State of Florida and prequalified by the Florida Department of Transportation for work in Intelligent Transportation Systems.

A Mandatory Pre Bid Conference is scheduled for **March 8, 2011, at 9:00 A.M.** in the City of Ocala Public Works Conference Room located at 2100 N.E. 30th Avenue, Building A, Ocala, Florida 34470. At this conference all questions pertaining to the Bid will be answered. Bids will not be accepted if the **BIDDER** fails to attend the mandatory Pre-Bid Conference.

If reasonable accommodations are needed for you to participate in this meeting, please call Judy E. McMinn, Administrative Chief/Purchasing Agent at (352) 351-6757 forty-eight (48) hours in advance so arrangements can be made.

Bids will be received on a unit price basis.

Bid security equal to five percent (5%) of the total bid must accompany each bid.

BIDDER is to submit one (1) original of a signed and completed submittal package (original must be unbound and marked “**original**”) and **one (1) copy** for evaluation use. In addition, **BIDDER** must submit **one (1) electronic copy** of their ITB #11-006 in PDF format on a CD. ITB #11-006 must be submitted in a **sealed envelope or box** with the ITB number, title, and the proposer’s name, address, and telephone number clearly indicated on the package. All ITB’s must be completed in blue ink or typewritten, or a computer printout with written signature returned by the time and date cited above.

BIDDER’S are strongly encouraged to carefully read the entire ITB #11-006.

The Successful **BIDDER** will be required to furnish a Construction Performance Bond and a Construction Payment Bond as security for the faithful performance of the payment of all bills and obligations arising from the performance of the Contract.

The **CONTRACTOR** and all subcontractors will be required to conform to the labor standards and employment requirements set forth in the Contract Documents.

It is the **BIDDER’S** responsibility to assure that their bid is delivered at the proper time to the Public Services Office or specified location. Bids, which for any reason are not so delivered, will not be considered. Any bids received after the date and time specified, **will not** be accepted.

This project will require the **CONTRACTOR** to have Volume I, City of Ocala “General Conditions for Construction”; Volume III, City of Ocala “Standard Specifications”; and Florida Department of Transportation (F.D.O.T.) Standard Specifications for Road and Bridge Construction, latest edition. Volume I may be obtained by downloading from the City of Ocala website at ocalafl.org, go to City Services and Departments, Public Services, Engineering, Administration. F.D.O.T. Standard Specifications for Road and Bridge Construction can be obtained from Florida Department of Transportation, Maps & Publications Sales, Mail Station 12, 605 Suwannee Street, Tallahassee, FL 32399-0450 or from their website.

If the Contract is to be awarded, the **OWNER** will give the Successful **BIDDER** a Notice of Award within the number of days set forth in the Bid Form for acceptance of the Bid.

Any questions relative to any item(s) or portion of this Invitation to Bid should be directed to Judy E. McMinn at JMcMinn@ocalafl.org or (352) 351-6757.

CITY OF OCALA, FLORIDA

Judy E. McMinn
Administrative Chief/Purchasing Agent
Public Services

REQUIRED SUBMITTALS CHECKLIST

Note: Submittal is required for each box checked for bid to be considered.

 X Bid Response Form

 X Drug Free Workplace Certificate

 X Affidavit of Compliance

 X Equipment Questionnaire

 X Certificate of Insurance

 Financial Statement

 X List of References

 X List of Subcontractors

 X 5% Maintenance Bond/or Other Assurances as acceptable by the City.

 X 100% Performance Bond

 X MSDS Sheets (if applicable)

 X Complete Equipment List

 Other: _____

 Other: _____

CITY OF OCALA
CONTRACT NO. ITB #11-006:
ADVANCED TRAFFIC MANAGEMENT SYSTEM, PHASE I

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INSTRUCTIONS TO BIDDERS

1.01 GENERAL

Instructions to **BIDDERS** for this project are found in Volume 1, City of Ocala, "General Conditions for Construction", Pages 00100-1 to 00100-18.

1.02 SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

The following change, additions, deletions, and/or clarifications are hereby made part of the **INSTRUCTIONS TO BIDDERS**:

Any reference to **CITY ENGINEER** in the "General Conditions" shall be changed to **ENGINEER**.

Any reference to Purchasing Department or Purchasing Agent shall be changed to Judy McMinn, Office of Public Services.

Any reference to Purchasing address or Engineering address shall be changed to:

Public Works
Office of Public Services
2100 N.E. 30th Avenue, Building A, Gate 1
Ocala, FL 34470

1.03 INQUIRIES:

Prospective proposers may make written inquiries concerning this ITB to obtain clarification of requirements. No inquiries will be accepted after 2:00 p.m. on February 15, 2011. Questions should be submitted in writing via email (preferred method), mail or fax to: Winston E. Schuler, Project Manager, 2100 N.E. 30th Avenue, Bldg. A, Ocala, Florida 34470, (352) 629-3167 (Fax), wschuler@ocalafl.org

1.04 AMENDMENTS TO ITB:

If it becomes necessary to revise or amend any part of this Invitation to Bid, the Office of Public Services will furnish the revision by written Addendum. It is the proposer's responsibility to inquire if any Addenda have been issued. Any addenda will be posted to Demandstar at www.demandstar.com and on the City's http://www.ocalafl.org/bids_local.aspx, "Bid Processing Page" link. Any addenda must be acknowledged.

1.05 It is the responsibility of the **BIDDER** to download and thoroughly examine the Specifications, Contract Documents and any Addenda issued prior to the opening of bids. Bidding documents can be downloaded from http://www.ocalafl.org/gids_local.aspx.

**CITY OF OCALA, FLORIDA
STATEMENT OF "NO BID"**

IF YOU DO NOT INTEND TO BID ON THIS REQUIREMENT, PLEASE COMPLETE AND RETURN THIS FORM PRIOR TO DATE SHOWN FOR RECEIPT OF BIDS TO: CITY OF OCALA, PUBLIC SERVICES , 2100 N.E. 30th AVENUE, BUILDING A, GATE 1, OCALA, FLORIDA 34470.

WE, THE UNDERSIGNED, HAVE DECLINED TO BID ON YOUR BID NO. _____
OPENING _____, FOR _____ FOR THE
FOLLOWING REASON(S):

- _____ SPECIFICATIONS ARE TOO "TIGHT" GEARED TOWARD ONE BRAND
OR MANUFACTURER ONLY (PLEASE EXPLAIN IN REMARKS SECTION
BELOW.)
- _____ INSUFFICIENT TIME TO RESPOND TO INVITATION TO BID.
- _____ WE DO NOT OFFER THIS PRODUCT/S OR EQUIVALENT.
- _____ REMOVE US FROM YOUR BIDDERS' LIST FOR THIS COMMODITY
OR SERVICE.
- _____ OUR PRODUCT SCHEDULE WOULD NOT PERMIT US TO PERFORM.
- _____ UNABLE TO MEET SPECIFICATIONS.
- _____ UNABLE TO MEET BOND REQUIREMENTS.
- _____ UNABLE TO MEET INSURANCE REQUIREMENTS.
- _____ SPECIFICATIONS UNCLEAR (PLEASE EXPLAIN IN REMARKS
SECTION BELOW).
- _____ COMPETITION RESTRICTED BY PRE-APPROVED CITY OF OCALA
STANDARDS.
- _____ OTHER (PLEASE SPECIFY IN REMARKS SECTION BELOW).

REMARKS: _____

WE UNDERSTAND THAT IF THIS “NO BID” LETTER IS NOT EXECUTED AND RETURNED, OUR NAME MAY BE DELETED FROM THE LIST OF QUALIFIED BIDDER’S FOR THE CITY OF OCALA FOR FUTURE PROJECTS OR COMMODITIES.

COMPANY NAME _____

ADDRESS _____

SIGNATURE AND TITLE _____

TELEPHONE NUMBER _____ DATE _____

BID FORM

PROJECT IDENTIFICATION:

BID No. **ITB #11-006: ADVANCED TRAFFIC MANAGEMENT SYSTEM, PHASE I**

THIS BID IS SUBMITTED TO:

Judy McMinn, Public Services
City of Ocala
2100 N.E. 30th Avenue, Building A, Gate 1
Ocala, FL 34470

- 1.01 The undersigned **BIDDER** proposes and agrees, if this Bid is accepted, to enter into an agreement with the **OWNER** in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
- 2.01 **BIDDER** accepts all of the terms and conditions of the Invitation to Bid and the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the day of Bid opening, or for such longer period of time that **BIDDER** may agree to in writing upon request of the **OWNER**. **BIDDER** will sign and submit the **AGREEMENT** with the bonds and other documents required by the Bidding Documents within 10 days after the date of the **OWNER'S** Notice of Award.
- 3.01 In submitting this Bid, **BIDDER** represents that:
- A. **BIDDER** has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents and the following Addenda, receipt of which is hereby acknowledged.

No. _____	Dated _____
No. _____	Dated _____
No. _____	Dated _____
No. _____	Dated _____
No. _____	Dated _____

- B. **BIDDER** has visited the site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, and performance of the Work.

- C. **BIDDER** is familiar with and is satisfied as to all Federal, State, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. **BIDDER** has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except underground facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions, and reports and drawings of a Hazardous Environmental Condition, if any, which have been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.
- E. **BIDDER** has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by **BIDDER**, including applying the specific means, methods, techniques, sequences, and procedures of construction required by the Bidding Documents to be employed by **BIDDER**, and safety precautions and programs incident thereto.
- F. **BIDDER** does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid or performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
- G. **BIDDER** is aware of the general nature of work to be performed by the **OWNER** and others at the Site that relates to the Work indicated in the Bidding Documents.
- H. **BIDDER** has correlated the information known to **BIDDER**, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- I. **BIDDER** has given the **ENGINEER** or the **CONSULTING ENGINEER** written notice of all conflicts, errors, ambiguities, or discrepancies that **BIDDER** has discovered in the Bidding Documents, and the written resolution thereof by the **ENGINEER** or the **CONSULTING ENGINEER** is acceptable to **BIDDER**.
- J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

- 4.01 **BIDDER** further represents that this Bid is genuine and is not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; **BIDDER** has not directly or indirectly induced or solicited any other **BIDDER** to submit a false or sham Bid; **BIDDER** has not solicited or induced any individual or entity to refrain from bidding; and **BIDDER** has not sought by collusion to obtain for itself any advantage over any other **BIDDER** or the **OWNER**.
- 5.01 **BIDDER** has attended the Pre-Bid Conference.
- 6.01 **BIDDER** will complete the Work for the following prices, computed in accordance with Paragraph 11.03B of the General Conditions. **BIDDER** acknowledges that estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and that final payment for all Unit Price Bid Items will be based on actual quantities provided, determined as provided in the Contract Documents.

SCHEDULE OF PRICES BID
ADVANCED TRAFFIC MANAGEMENT SYSTEM, PHASE I
BID NO. ITB #11-006

ITEM NO.	DESCRIPTION	UNIT	EST QTY	UNIT PRICE	TOTAL AMOUNT
GENERAL CONSTRUCTION					
101-1	MOBILIZATION	LS	1	\$_____	\$_____
102-1	MAINTENANCE OF TRAFFIC	LS	1	\$_____	\$_____
102-14	TRAFFIC CONTROL OFFICER	MH	72	\$_____	\$_____
555-1-1	2-2" HDPE CONDUIT (DIRECTIONAL BORE) F&I	LF	180	\$_____	\$_____
555-1-2	3-2" HDPE CONDUIT (DIRECTIONAL BORE) F&I	LF	290	\$_____	\$_____
630-1-12	CONDUIT UNDERGROUND (2" PVC) F&I	LF	1145	\$_____	\$_____
635-1-11	PULL BOX F&I	EA	6	\$_____	\$_____
639-1-22	ELECTRICAL POWER (PURCHASED BY CONTRACTOR FROM POWER COMPANY)	AS	3	\$_____	\$_____
639-2-1	POWER SERVICE WIRE	LF	1090	\$_____	\$_____
641-2-12	PRESTRESSED CONCRETE POLE TYPE P-11(12') F&I	EA	3	\$_____	\$_____
668-13	CABINET (F.D.O.T. TYPE III (INDEX 17900) – 32"X20"X14") F&I	EA	15	\$_____	\$_____
690-50	EXSISTING CABINET REMOVAL	EA	2	\$_____	\$_____
700-20-11	SINGLE POST TRAFFIC SIGN (I-75 ROUTE SIGNS) F&I	AS	4	\$_____	\$_____
700-20-19	SINGLE POST WITH SCROLLING MYLAR SIGN (SPECIAL) F&I	AS	15	\$_____	\$_____
700-48-19	TRAFFIC SIGN F&I ("WHEN FLASHING") SIGN ONLY	EA	8	\$_____	\$_____

ITEM NO.	DESCRIPTION	UNIT	EST QTY	UNIT PRICE	TOTAL AMOUNT
700-90-11	SOLAR FLASHING BEACON CONTROLLER ASSEMBLY F&I	AS	8	\$_____	\$_____
741-70-111	TMS, VEHICLE SENSOR, CLASS II, TYPE I, ½ LANE (6 FT.), F&I	EA	4	\$_____	\$_____
743-70-11	TMS, VEHICLE SPEED/CLASS, UNIT (ELECTRONICS UNIT WITH EQUIPMENT CABLE) F&I	AS	3	\$_____	\$_____
745-70-12	TMS, INDUCTIVE LOOP ASSEMBLE (TWO LOOPS/LANE) F&I	AS	8	\$_____	\$_____
746-71-131	TMS, TYPE III CABINET (PEDESTAL MOUNTED), BACKPLANE, F&I	EA	3	\$_____	\$_____
780-1-11	ITS ELECTRICAL POWER (SOLAR) F&I	AS	15	\$_____	\$_____
782-1-11	ITS CCTV CAMERA (DOME ENCLOSED- PRESSURIZED), F&I	EA	17	\$_____	\$_____
783-8-1	6 WIRE/18GAUGE SHIELDED CABLE WITH (1) CAT 5e UV RATED SHIELDED CABLE	LF	2410	\$_____	\$_____
783-4-111	ITS CONDUIT (2" DIA. GALVANIZED STEEL RISER, ABOVEGROUND), F&I	LF	126	\$_____	\$_____
783-4-112	ITS CONDUIT (2" DIA. P.V.C. UNDERGROUND), F&I	LF	189	\$_____	\$_____
783-7-1	ITS PULL AND JUNCTION BOX, F&I	EA	8	\$_____	\$_____
784-6-11	ITS RADIO COMMUNICATIONS (MASTER LOCATION), F&I	EA	6	\$_____	\$_____
784-6-13	ITS RADIO COMMUNICATIONS (REMOTE LOCATION), F&I	EA	18	\$_____	\$_____
785-1-13	ITS POLE, CONCRETE WITHOUT LOWERING DEVICE, F&I	EA	1	\$_____	\$_____
785-2-111	ITS POLE MOUNTED CABINET, F&I	EA	1	\$_____	\$_____

TOTAL BID: \$ _____

7.01 **BIDDER** agrees that the Work will be substantially completed within One hundred eighty (180) days, and completed and ready for final payment in accordance with the Agreement within Thirty (30) days after substantial completion.

8.01 **BIDDER** accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified above.

9.01 Communications concerning this Bid shall be sent to **BIDDER** at the following address:

10.01 The terms used in this Bid have the meanings indicated in the Instructions to **BIDDERS**, the General Conditions, and the Supplementary Conditions.

11.01 Proposal
To Whom It May Concern:

As a **BIDDER** for this project, and in compliance with your invitation to bid for the furnishing, construction, and installation of the quantities listed in the Schedule of Prices Bid, we propose the following:

Total Bid (figures):

Base Bid: \$ _____

Total Bid (written words):

Base Bid: _____

SIGNATURE OF BIDDER

Contractor's License Number _____

License Expiration Date: _____

If an Individual

By _____
(Signature of Individual)

doing business as _____

Business address _____

Phone No. _____

Date _____

If a Partnership

By: _____
(Firm Name)

(Signature of General Partner)

Business Address: _____

Phone No.: _____

Date: _____

If a Corporation

By: _____
(Corporation Name)

(Signature of Authorized Person)

(Title)

Business Address: _____

Phone No.: _____

Date: _____

If a Joint Venture (Other party must sign below.)

Contractor's License Number: _____

License Expiration Date: _____

If an Individual

By: _____
(Signature of Individual)

Doing Business As: _____

Business Address: _____

Phone No.: _____

Date: _____

BID BOND
PENAL SUM FORM

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

BID

BID DUE DATE: _____

PROJECT (Brief Description Including Location):

BOND

BOND NUMBER: _____

DATE (Not later than Bid due date:) _____

PENAL SUM: _____

(Words)

(Figures)

IN WITNESS WHEREOF, Surety and **BIDDER**, intending to be legally bound hereby, subject to the terms printed on the following page, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

_____(Seal)

Bidder's Name and Corporate Seal

_____(Seal)

Surety's Name and Corporate Seal

By: _____

Signature and Title

By: _____

(Signature and Title (Attach Power of Attorney))

Attest: _____

Attest: _____

- Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to **BIDDER**, Surety, the **OWNER** or other party shall be considered plural where applicable.

PENAL SUM FORM

1. **BIDDER** and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to the **OWNER** upon default of **BIDDER** the penal sum set forth on the face of this Bond.

2. Default of **BIDDER** shall occur upon the failure of **BIDDER** to deliver within the time required by the Bidding Documents) or any extension thereof agreed to in writing by the **OWNER**) the executed **AGREEMENT** required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 The **OWNER** accepts **BIDDER'S** Bid and **BIDDER** delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by the **OWNER**) the executed **AGREEMENT** required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents, or

3.2 All Bids are rejected by the **OWNER**, or

3.3 The **OWNER** fails to issue a Notice of Award to **BIDDER** within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by **BIDDER** and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default by **BIDDER** and within 30 calendar days after receipt by **BIDDER** and Surety of written notice of default from the **OWNER**, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by the **OWNER** and **BIDDER**, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by **BIDDER** and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to **BIDDER** and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States

Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached too this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer or proposal as applicable.

EJCDC NO. 1910-28-C (1996 Edition)

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. The statement must be notarized. If necessary, questions may be answered on separate attached sheets. The **BIDDER** may submit any additional information they desire. If the **BIDDER** has done similar work for the City of Ocala within the past three (3) years and if no circumstances have changed that would affect the ability of the **BIDDER** to perform the work in accordance with the Contract Documents, only Items A, B, F, and P need to be addressed.

- A. Name of bidder.
- B. Permanent main office address.
- C. When organized.
- D. If a corporation, where incorporated.
- E. How many years have you been engaged in the contracting business under your present firm or trade name?
- F. Contracts on hand (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)
- G. General character of work performed by your company.
- H. Have you ever failed to complete any work awarded to you? If so, where and why?
- I. Have you ever defaulted on a contract? If so, where and why?
- J. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed.
- K. List your major equipment available for this contract.
- L. Experience in construction work similar in type to this project.
- M. Background and experience of the principal members of your organization, including the officers.
- N. Credit available: \$_____
- O. Give bank reference: _____

P. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the City of Ocala in verification of the recitals comprising this Statement of **BIDDER'S** Qualifications, in verification of the undersigned's experience, or in verification of the undersigned's ability to perform the work contemplated in accordance with the Contract Documents. The undersigned also hereby agrees, upon request from the City of Ocala, to furnish any additional information which may reasonably be required by the City of Ocala to determine the ability of the **BIDDER** to perform the work contemplated in accordance with the Contract Documents.

Dated at _____ this _____ day of _____, _____.

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me this _____ day of _____, _____, by _____.

(Signature of Notary Public)

(Print, type, or stamp Commissioned Name of
Notary Public)

Personally Known ☐ **OR** Produced Identification ☐

Type of Identification produced: _____

DRUG FREE WORKPLACE AFFIDAVIT

Pursuant to Section 287.087, Florida Statutes, each **BIDDER** shall complete the Drug Free Workplace Affidavit and submit same with any bid response. The Drug Free Workplace Affidavit for is found on the following page of this Request for Bids. The City of Ocala requires that this form be submitted with each bid.

DRUG FREE WORKPLACE AFFIDAVIT

I, the undersigned, in accordance with Florida Statute 287.087, hereby certify that

(Print or type name of firm)

- Published a written statement notifying that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace named above, and specifying actions that will be taken against violations of such prohibition.
- Informs employees about the dangers of drug abuse in the workplace, the firm's policy of maintaining a drug free working environment, and available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug use violations.
- Gives each employee engaged in providing commodities or contractual services that are under bid or proposal, A copy of the statement specified above.
- Notifies the employees that as a condition of working on the commodities or contractual services that are under bid or proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, pleas of guilty or nolo contendere to any violation of Chapter 1893, or of any controlled substance law of the State of Florida or the United States, for a violation occurring in the workplace, no later than five (5) days after such conviction, and requires employees to sign copies of such written (*) statement to acknowledge their receipt.
- Imposes a sanction on, or requires the satisfactory participation in, a drug abuse assistance or rehabilitation program, if such is available in the employee's community, by any employee who is so convicted.
- Makes a good faith effort to continue to maintain a drug free work place through the implementation of the drug free workplace program.

"As a person authorized to sign this statement, I certify that the above named business, firm or corporation complies fully with the requirements set forth herein."

Authorized Signature

Date Signed

State of:_____

County of:_____

Sworn to and subscribed before me this ____ day of _____, 20____.

Personally known _____ or Produced Identification _____
(Specify Type of Identification)

Signature of Notary

My Commission Expires_____

Section 00417

FLORIDA TRENCH SAFETY ACT

The **BIDDER** acknowledges that included in the various items of the proposal and in the Total Bid Price are costs for complying with the Florida Trench Safety Act (90-96, Laws of Florida) effective October 1, 1990. The **BIDDER** further identifies the costs to be summarized below:

Trench Safety Measure (Description)	Units of Measure (LF,SY)	Unit (Quantity)	Unit Cost	Extended Cost
A. _____	_____	_____	_____	_____
B. _____	_____	_____	_____	_____
C. _____	_____	_____	_____	_____
D. _____	_____	_____	_____	_____

TOTAL: _____

Failure to complete the above may result in the bid being declared non-responsive.

BIDDER'S REFERENCE LIST

The **BIDDER** must provide at least three references. Please fill in all information for each reference.

REFERENCES

1. Company Name: _____
Address: _____
City, State, Zip: _____
Telephone: (____) _____

2. Company Name: _____
Address: _____
City, State, Zip: _____
Telephone: (____) _____

3. Company Name: _____
Address: _____
City, State, Zip: _____
Telephone: (____) _____

4. Company Name: _____
Address: _____
City, State, Zip: _____
Telephone: (____) _____

5. Company Name: _____
Address: _____
City, State, Zip: _____
Telephone: (____) _____

Section 00430

LIST OF SUBCONTRACTORS

In compliance with the Instructions to **BIDDERS** and other Contract Documents, the undersigned submits the following names of subcontractors to be used in performing the Work for Bid No. ITB # 11-006: ADVANCED TRAFFIC MANAGEMENT SYATEM, PHASE I

BIDDER certified that all subcontractors listed are eligible to perform the work.

<u>Subcontractor's Work</u>	<u>Subcontractor's Name</u>	<u>Material Suppliers</u>

NOTE: This form must be submitted with the Bid in accordance with the Instructions to Bidders.

Bidder's Signature

EQUIPMENT QUESTIONNAIRE

The **BIDDER** shall enter in the spaces provided, the name of the manufacturers of equipment which **BIDDER** proposed to furnish, and shall submit this Equipment Questionnaire with its Bid. The **CITY** will review and evaluate the information before award of the Contract.

Only one manufacturer's name shall be listed for each item of equipment. Upon award of a contract, the named equipment shall be furnished. Substitutions will be permitted only if named equipment does not meet the requirements of the Contract Documents, the manufacturer is unable to meet the delivery requirements of the construction schedule, or the manufacturer is dilatory in complying with the requirements of the Contract Documents. Substitutions shall be subject to concurrence of the **CITY** and shall be confirmed by change order.

Preliminary acceptance of equipment listed by manufacturer's name shall not in any way constitute a waiver of the specifications covering such equipment; final acceptance will be based on full conformity with the Contract Documents.

Failure to furnish all information requested or entering more than one manufacturer's name for any item in this Equipment Questionnaire may be cause for rejection of the Bid.

<u>Equipment</u>	<u>Manufacturer</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

CITY OF OCALA – LOCAL VENDOR PREFERENCE
AFFIDAVIT OF ELIGIBILITY

This Form is to be completed in its entirety by the prime vendor and submitted with your bid. Incomplete forms will be rejected for preference evaluation.

In addition, each vendor shall submit a separate form for each major subcontractor the vendor proposes to employ. A major subcontractor is defined as a subcontractor whose subcontract constitutes five (5%) percent or more of the total contract price. In order for a vendor to be considered for local vendor preference, all major subcontractors must also qualify. Copy this form if additional forms are required and attach as submittals to each bid.

1. Name of Firm: _____

Mailing Address: _____

Physical Address (if different): _____

2. Date your business was established in City of Ocala: _____

or

Date your business was established in Marion County: _____

3. Did you pay business or real property tax to either the

City or the County for the most recent tax year?

Yes _____ No _____

4. Are you planning to employ any major subcontractors?

Yes _____ No _____

Under penalty of perjury, the undersigned states that the foregoing statements are true and correct. The undersigned also acknowledges that any person, firm, corporation or entity intentionally submitting false information in an attempt to qualify for local vendor preference shall be prohibited from bidding on City of Ocala products and services in accordance with CP-161 of the City of Ocala's Purchasing and Procedures manual.

Authorized Signature: _____

Date: _____

Printed Name & Title: _____

Phone: _____

State of: _____

County of: _____

Sworn to and subscribed before me this _____ day of _____, 20 ____

Personally known _____ or Produced Identification _____

(Specify Type of Identification)

Signature of Notary

My _____ Commission Expires _____

AGREEMENT

THIS **AGREEMENT** is by and between CITY OF OCALA (herein called the **OWNER**) and _____ (herein called the **CONTRACTOR**).

The **OWNER** and the **CONTRACTOR**, in consideration of the mutual covenants herein set forth, agree as follows:

ARTICLE 1 – WORK

1.01 The **CONTRACTOR** shall complete all Work as specified or indicated in the Contract Documents based on the acceptance by the **OWNER** or the **CONTRACTOR'S** Bid.

The Work is generally described as follows:

Providing all materials, labor, and equipment to complete the Construction of Intelligent Transportation Systems; including but not limited to the following:

GENERAL

- Construction of CCTV Cameras.
- Construction of Scrolling Mylar and Static Signs.
- Construction of Communication Devices.
- Construction of Traffic Monitoring Stations.

ARTICLE 2 – ENGINEER

The Project has been designed by the Tindale – Oliver & Associates Inc. / DKS Associates, who is referred to in the Contract Documents as the CONSULTANT / DESIGN CONSULTANT.

ARTICLE 3 – CONTRACT TIMES, LIQUIDATED DAMAGES, DELAYS AND DAMAGES, DELAY COMPENSATION

3.01 Time of the Essence

All time limits for Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

3.02 Contract Times

The Contract Times shall be as indicated in the **CONTRACTOR'S** Bid. The Work shall be substantially completed within the number of days indicated in the **CONTRACTOR'S** Bid after the date when the Contract Times commence to run as provided in Paragraph 12.03 of the General Conditions, and completed and ready for final payment in accordance with

Paragraph 14.07.B of the General Conditions within the number of days indicated in the **CONTRACTOR'S** Bid after the date when the Contract Times commence to run.

Liquidated Damages

- A. The **OWNER** and the **CONTRACTOR** recognize that time is of the essence of this **AGREEMENT** and that the **OWNER** will suffer financial loss and additional expenses if the Work is not completed within the times specified in Paragraph 3.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expenses, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the **OWNER** if the Work is not completed on time. Accordingly, instead of requiring any such proof, the **OWNER** and the **CONTRACTOR** agree that as liquidated damages for delay (but not as a penalty) the **CONTRACTOR** shall pay the **OWNER** \$200.00 for each day that expires after the time specified in Paragraph 3.2 (above) for Substantial Completion until the Work is substantially completed. After Substantial Completion, if the **CONTRACTOR** shall neglect, refuse, or fail to complete the remaining Work within the Contract Times or any proper extension thereof granted by the **OWNER**, the **CONTRACTOR** shall pay the **OWNER** \$200.00 for each day that expires after the time specified in Paragraph 3.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.
- B. The liquidated damages set forth herein shall not be accumulative. If Substantial Completion of the Work is not met within the time specified for final completion of all Work, the liquidated damages shall continue to be at the rate or rates specified for default on Substantial Completion until Substantial Completion is attained. If the Work is not then finally completed, the rate or rates specified for default on final completion shall apply until final completion is attained.
- C. The **OWNER** shall have the right to deduct the liquidated damages from any money in its hands, otherwise due, or to become due, to the **CONTRACTOR**, or to initiate applicable dispute resolution procedures and to recover liquidated damages for non-performance of this Contract within the time stipulated.

3.03 Delays and Damages

In the event the **CONTRACTOR** is delayed in the prosecution and completion of the Work because of any delays caused by the **OWNER** or the **CONSULTING ENGINEER** and, except as set forth in Paragraph 12.06 of the General Conditions, the **CONTRACTOR** shall have no claim against the **OWNER** or the **CONSULTING ENGINEER** for damages or contract adjustment other than an extension of the Contract Times and the waiving of liquidated damages during the period occasioned by the delay.

ARTICLE 4 – CONTRACT PRICE

- 4.01 The **OWNER** shall pay the **CONTRACTOR** in current funds, for completion of the Work designated in Article 1 in accordance with the Contract Documents, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item as indicated in the **CONTRACTOR'S** Bid, for the total amount of:

_____ (\$ _____)
(words) (figures)

As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by the **CONSULTING ENGINEER** as provided in Paragraph 9.08 of the General Conditions. Unit prices have been computed as provided in Paragraph 11.03 of the General Conditions.

ARTICLE 5 – PAYMENT PROCEDURES

5.01 Submittal and Processing of Payments

The **CONTRACTOR** shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by the **ENGINEER** as provided in General Conditions.

5.02 Progress Payments; Retainage

- A. The **OWNER** shall make progress payments on account of the Contract Price on the basis of the **CONTRACTOR'S** Applications for Payment as established at the pre-construction meeting. All progress payments will be on the basis of the progress of the Work measured by the schedule of values established in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed).
- B. Prior to Substantial Completion, the **OWNER** will retain from progress payments, less the aggregate of payments previously made and less such amounts as the **CONSULTING ENGINEER** shall determine or the **OWNER** may withhold in accordance with Paragraph 14.02.B.5 of the General Conditions, an amount equal to the following percentages:
1. Until Substantial Completion, retainage will be 10% of the Work completed. After Substantial Completion, retainage will be 5% of the Work completed.
 2. Retainage will be 10% of the value of materials and equipment that are not incorporated in the Work but are delivered, suitably stored, and accompanied by documentation satisfactory to the **OWNER** as provided in Paragraph 14.02.A.1 of the General Conditions. Stored materials and equipment retainage will be released when the materials and equipment are incorporated in the Work.

- C. Upon Substantial Completion, the **OWNER** may retain at all times an amount sufficient to cover the cost of the Work remaining to be completed.
- D. The reduction or termination of additional retainage will not be initiated at any time if the Work is behind schedule; and, subsequent to reducing retainage, the full retainage of payments authorized may be reinstated any time the Work falls behind schedule.
- E. Consent of the Surety shall be obtained before any retainage is paid by the **OWNER**. Consent of the Surety, signed by an agent, must be accompanied by a certified copy of such agent's authority to act for the Surety.

5.03 Final Payment

Upon completion and acceptance of the Work in accordance with Paragraph 14.07.A of the General Conditions, the **OWNER** shall pay the remainder of the Contract Price as recommended by the **CONSULTING ENGINEER** as provided in Paragraph 14.07B.

ARTICLE 6 – CONTRACTOR REPRESENTATIONS

- 6.01 In order to induce the **OWNER** to enter into this **AGREEMENT**, the **CONTRACTOR** makes the following representations:
- A. The **CONTRACTOR** has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. The **CONTRACTOR** has visited the site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, and performance of the Work.
 - C. The **CONTRACTOR** is familiar with and is satisfied as to all Federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. The **CONTRACTOR** has studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except underground facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions and reports and drawings of a Hazardous Environmental Condition, if any, at the site which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.

- E. The **CONTRACTOR** has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by the **CONTRACTOR** including application of the specific means, methods, techniques, sequences, and procedures of construction, if any, expressly required by the Contract Documents to be employed by the **CONTRACTOR**, and safety precautions and programs incident thereto.
- F. The **CONTRACTOR** does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. The **CONTRACTOR** is aware of the general nature of work to be performed by **OWNER** and others at the site that relates to the Work as indicated in the Contract Documents.
- H. The **CONTRACTOR** has correlated the information known to the **CONTRACTOR**, information and observations obtained from visits to the site, reports and drawings identified in the Contract Drawings, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- I. The **CONTRACTOR** has given the **CONSULTING ENGINEER** written notice of all conflicts, errors, ambiguities, or discrepancies that the **CONTRACTOR** has discovered in the Contract Documents, and the written resolution thereof by the **CONSULTING ENGINEER** is acceptable to the **CONTRACTOR**.
- J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 7 – CONTRACT DOCUMENTS

- 7.01 The Contract Documents which comprise the entire **AGREEMENT** between the **OWNER** and the **CONTRACTOR** concerning the Work consist of the following:
 - A. This agreement
 - B. Performance and Payment Bonds
 - C. Volume I, City of Ocala General Conditions for Construction
 - D. Supplementary Conditions

- E. Specifications
- F. Drawings consisting of 49 sheets,
- G. Appendix No. 1 through 108.
- H. Exhibits to the Agreement, enumerated as follows:
 - 1. Contractor's Bid.
 - 2. Notice to Proceed
- I. Equipment Questionnaire
- J. Statement of Bidders Qualifications
- K. List of Subcontractors
- L. The following, which may be delivered or issued after the effective date of the Agreement and are not attached hereto:
 - 1. Written Amendments
 - 2. Work Change Directives
 - 3. Change Orders
 - 4. Maintenance and Guarantee Bonds

***NOTE: ALL ORIGINAL CONTRACT DOCUMENTS ARE MAINTAINED IN THE CITY PURCHASING DEPARTMENT**

7.01 There are no Contract Documents other than those listed in this Article.

7.02 The Contract Documents may be amended, modified, or supplemented only as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 8 – MISCELLANEOUS

8.01 Terms

Terms used in this **AGREEMENT** will have the meanings indicated in Volume 1 City of Ocala General Conditions for Construction.

8.02 Assignment of Contract

No assignment by a party hereto of any rights under or interest in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and specifically, but without limitation,

8.03 Successors and Assigns

The **OWNER** and the **CONTRACTOR** each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

8.04 Severability

Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon the **OWNER** and the **CONTRACTOR**, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

8.05 Business Addresses

The business address of the **CONTRACTOR** given herein is hereby designated as the place to which all notices, letters, and other communications to the **CONTRACTOR** will be mailed or delivered. The address of the **OWNER** appearing herein is hereby designated as the place to which all notices, letters, and other communications to the **OWNER** shall be mailed or delivered. Either party may change its address at any time by an instrument in writing delivered to the **CONSULTING ENGINEER** and to the other party.

8.06 Attorneys' Fees

If any civil action, arbitration or other legal proceeding is brought for the enforcement of this **AGREEMENT**, or because of an alleged dispute, breach, default or misrepresentation in connection with any provision of this **AGREEMENT**, the successful or prevailing party shall be entitled to recover reasonable attorneys' fees, sales and use taxes, court costs, and all

expenses even if not taxable as court costs (including, without limitation, all such fees, taxes, costs and expenses incident to arbitration, appellate, bankruptcy and post-judgment proceedings), incurred in that civil action, arbitration or legal proceeding, in addition to any other relief to which such party or parties may be entitled. Attorneys' fees shall include, without limitation, paralegal fees, investigative fees, administrative costs, sales and use taxes and all other charges billed by the attorney to the prevailing party.

8.07 Jurisdiction and Venue

The parties acknowledge that a majority of the negotiations, anticipated performance and execution of this **AGREEMENT** occurred or shall occur in Marion County, Florida. Any civil action or legal proceeding arising out of or relating to this **AGREEMENT** shall be brought only in the courts of record of the State of Florida in Marion County or the United States District Court, Middle District of Florida, Ocala Division. Each party consents to the exclusive jurisdiction of such court in any such civil action or legal proceeding and waives any objection to the laying of venue of any such civil action or legal proceeding in such court or the right to bring an action or proceeding in any other court. Service of any court paper may be affected on such party by mail, as provided in this agreement, or in such other manner as may be provided under applicable laws, rules or procedures or local rules.

8.08 Jury Waiver

IN ANY CIVIL ACTION, COUNTERCLAIM, OR PROCEEDING, WHETHER AT LAW OR IN EQUITY, WHICH ARISES OUT OF, CONCERNS, OR RELATES TO THIS **AGREEMENT**, ANY AND ALL TRANSACTIONS CONTEMPLATED HEREUNDER, THE PERFORMANCE HEREOF, OR THE RELATIONSHIP CREATED HEREBY, WHETHER SOUNDING IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE, TRIAL SHALL BE TO A COURT OF COMPETENT JURISDICTION AND NOT TO A JURY. EACH PARTY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY. NEITHER PARTY HAS MADE OR RELIED UPON ANY ORAL REPRESENTATIONS TO OR BY ANY OTHER PARTY REGARDING THE ENFORCEABILITY OF THIS PROVISION. EACH PARTY HAS READ AND UNDERSTANDS THE EFFECT OF THIS JURY WAIVER PROVISION IN WITNESS WHEREOF, **CITY** AND **CONTRACTOR** HAVE SIGNED THIS **AGREEMENT**. ONE COUNTERPART EACH HAS BEEN DELIVERED TO **CITY, CONTRACTOR, SURETY, AND DESIGN ENGINEER**.

This agreement will be effective on _____.

OWNER: CITY OF OCALA CONTRACTOR: _____

By: _____ By: _____

Daniel Owen
Title: City Council President Title: _____

Address for Giving Notices:

City of Ocala Public Works

2100 N.E./ 30th Avenue, Bldg A

Ocala, FL 34470

**APPROVED AS TO FORM AND
LEGALITY:**

Patrick G. Gilligan,
Assistant City Attorney

ATTEST:

Angel B. Jacobs,
City Clerk

Address for Giving Notices:

Contractor's License No.: _____

Expiration Date: _____

Joint Venture

Contractor: _____

By: _____

Title: _____

Address for giving notices

Contractor License No. _____

Expiration Date: _____

Section 00510

Performance Bond

Any singular reference to **CONTRACTOR**, Surety, **OWNER** or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

CONTRACT

Date:

Amount:

Description (Name and Location):

BID No. ITB #11-006: ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS), PHASE I

BOND

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and **CONTRACTOR**, intending to be legally bound hereby, subject to the terms printed on the next page hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

SURETY

Company: (Corp. Seal)

Signature: _____

Name and Title: _____

Signature: _____

Name and Title: _____

(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

SURETY

Company: (Corp. Seal)

Signature: _____

Name and Title: _____

Signature: _____

Name and Title: _____

EJCDC No. 1910-28-A (1996 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

1. The **CONTRACTOR** and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the **OWNER** for the performance of the Contract, which is incorporated herein by reference.

2. If the **CONTRACTOR** performs the Contract, the Surety and the **CONTRACTOR** have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.

3. If there is no **OWNER** Default, the Surety's obligation under this Bond shall arise after:

3.1 The **OWNER** has notified the **CONTRACTOR** and the Surety at the addresses described in Paragraph 10 below, that the **OWNER** is considering declaring a **CONTRACTOR'S** Default and has requested and attempted to arrange a conference with the **CONTRACTOR** and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Contract. If the **OWNER**, the **CONTRACTOR** and the Surety agree, the **CONTRACTOR** shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the **OWNER'S** right, if any, subsequently to declare a **CONTRACTOR'S** Default; and

3.2 The **OWNER** has declared a **CONTRACTOR'S** Default and formally terminated the **CONTRACTOR'S** right to complete the Contract. Such **CONTRACTOR'S** Default shall not be declared earlier than twenty days after the **CONTRACTOR** and the Surety have received notice as provided in Paragraph 3.1; and

3.3 The **OWNER** has agreed to pay the Balance of the Contract Price to:

3.3.1 The Surety in accordance with the terms of the Contract;

3.3.2 Another **CONTRACTOR** selected pursuant to Paragraph 4.3 to perform the Contract.

4. When the **OWNER** has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1 Arrange for the **CONTRACTOR**, with consent of the **OWNER**, to perform and complete the Contract; or

4.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

4.3 Obtain bids or negotiated proposals from qualified **CONTRACTORS** acceptable to the **OWNER** for a contract for performance and completion of the Contract, arrange for a Contract to be prepared for execution by the **OWNER** and the **CONTRACTOR** selected with the **OWNER'S** concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds Issued on the Contract, and pay to the **OWNER** the amount of damages as described in paragraph 6 in excess of the Balance of the Contract Price incurred by the **OWNER** resulting from the **CONTRACTOR'S** Default; or

4.4 Waive its right to perform and complete, arrange for completion, or obtain a new **CONTRACTOR** and with reasonable promptness under the circumstances;

4.4.1 After investigation, determine the amount for which it may be liable to the **OWNER** and, as soon as practicable after the amount is determined, tender payment therefore to the **OWNER**; or

4.4.2 Deny liability in whole or in part and notify the **OWNER** citing reasons therefore.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the **OWNER** to the Surety demanding that the Surety perform its obligations under this Bond, and the **OWNER** shall be entitled to enforce any remedy available to the **OWNER**. If the Surety proceeds as provided in Paragraph 4.4 and the **OWNER** refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the **OWNER** shall be entitled to enforce any remedy available to the **OWNER**.

(For Information Only—Name, Address and Telephone)

City of Ocala
ATMS, Phase I
Bid No. ITB #11-006

6. After the **OWNER** has terminated the **CONTRACTOR'S** right to complete the Contract, and if the Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the **OWNER** shall not be greater than those of the **CONTRACTOR** under the Contract, and the responsibilities of the **OWNER** to the Surety shall not be greater than those of the **OWNER** under the Contract. To a limit of the amount of this Bond, but subject to commitment by the **OWNER** of the Balance of the Contract Price to mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:

6.1 The responsibilities of the **CONTRACTOR** for correction of defective Work and completion of the Contract;

6.2 Additional legal, design professional and delay costs resulting from the **CONTRACTOR'S** Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and

6/3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the **CONTRACTOR**.

7. The Surety shall not be liable to the **OWNER** or others for obligations of the **CONTRACTOR** that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the **OWNER** or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after **CONTRACTOR'S** Default or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the **OWNER** or the **CONTRACTOR** shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions

12.1 Balance of the Contract Price: The total amount payable by the **OWNER** to the **CONTRACTOR** under the Contract after all proper adjustments have been made, including allowance to the **CONTRACTOR** of any amount received or to be received by the **OWNER** in settlement of insurance or other claims for damages to which the **CONTRACTOR** is entitled, reduced by all valid and proper payments made to or on behalf of the **CONTRACTOR** under the Contract.

12.2 Contract: The agreement between the **OWNER** and the **CONTRACTOR** identified on the signature page, including all Contract Documents and changes thereto.

12.3 **CONTRACTOR'S** Default: Failure of the **CONTRACTOR**, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4 **OWNER'S** Default: Failure of the **OWNER**, which has neither been remedied nor waived, to pay the **CONTRACTOR** as required by the Contract or to perform and complete or comply with the other terms thereof.

AGENT OR BROKER:

OWNER'S REPRESENTATIVE (ENGINEER or other party):

00510
-2-

February 21, 2011
Performance Bond

Section 00520

Payment Bond

Any singular reference to **CONTRACTOR**, Surety, **OWNER** or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

CONTRACT

Date:

Amount:

Description (Name and Location):

BID No. ITB #11-006: ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS), PHASE I

BOND

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the next page hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent or representative.

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

SURETY

Company: (Corp. Seal)

Signature: _____

Name and Title: _____

Signature: _____

Name and Title: _____

(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

SURETY

Company: (Corp. Seal)

Signature: _____

Name and Title: _____

Signature: _____

Name and Title: _____

EJCDC No. 1910-28-A (1996 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

1. The **CONTRACTOR** and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the **OWNER** to pay for labor, materials and equipment furnished for use in the performance of the Contract, which is incorporated herein by reference.

2. With respect to the **OWNER**, this obligation shall be null and void if the **CONTRACTOR**:

2.1 Promptly makes payment, directly or indirectly, for all sums due claimants, and

2.2 Defends, indemnifies and holds harmless the **OWNER** from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract, provided the **OWNER** has promptly notified the **CONTRACTOR** and the Surety (at the addresses described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the **CONTRACTOR** and the Surety, and provided there is no **OWNER'S** default.

3. With respect to claimants, this obligation shall be null and void if the **CONTRACTOR** promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with the **CONTRACTOR** have given notice to the Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to the **OWNER**, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2 Claimants who do not have a direct contract with the **CONTRACTOR**:

4.2.1 Have furnished written notice to the **CONTRACTOR** and sent a copy, or notice thereof, to the **OWNER** within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

4.2.2 Have either received a rejection in whole or in part from the **CONTRACTOR**, or not received within 30 days of furnished the above notice any communications from the **CONTRACTOR** by which the **CONTRACTOR** had indicated the claim will be paid directly or indirectly; and

4.2.3 Not having been paid within the above 30 days, have sent a written notice to the Surety and sent a copy, or notice thereof, to the **OWNER** stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the **CONTRACTOR**.

5. If a notice required by Paragraph 4 is given by the **OWNER** to the **CONTRACTOR** or to the Surety, that is sufficient compliance.

6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

6.1 Send an answer to the Claimant, with a copy to the **OWNER**, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2 Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. Amounts owed by the **OWNER** to the **CONTRACTOR** under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the **CONTRACTOR** furnishing and the **OWNER** accepting this Bond, they agree that all funds earned by the **CONTRACTOR** in the performance of the Contract are dedicated to satisfy obligations of the **CONTRACTOR** and the Surety under this Bond, subject to the **OWNER'S** priority to use the funds for the completion of the Work.

9. The Surety shall not be liable to the **OWNER**, Claimants or others for obligations of the **CONTRACTOR** that are unrelated to the Contract. The **OWNER** shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payment to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the **OWNER** or the **CONTRACTOR** shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, the **OWNER** or the **CONTRACTOR**, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, the **CONTRACTOR** shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS

15.1 Claimant: An individual or entity having a direct contract with the **CONTRACTOR** or with a subcontractor of the **CONTRACTOR** to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the **CONTRACTOR** and the **CONTRACTOR'S** subcontractors, and all other items for which a mechanics lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

15.2 Contract: The agreement between the **OWNER** and the **CONTRACTOR** identified on the signature page, including all Contract Documents and changes thereto.

15.3 **OWNER'S** Default: Failure of the **OWNER**, which has neither been remedied nor waived, to pay the **CONTRACTOR** as required by the Contract or to perform and complete or comply with the other terms thereof.

MAINTENANCE AND GUARANTEE BOND

KNOW ALL MEN BY THESE PRESENTS, that _____,
CONTRACTOR, as principal, and _____, as
Surety, are held and firmly bound unto _____, in the sum
of _____ DOLLARS (\$_____) good and lawful
money of the United States of America, to be paid to the **OWNER**, its legal representatives and
assigns, for which payment well and truly made, we bind ourselves, our heirs, executors,
administrators, successors and assigns, and each and every one of them jointly and severally, firmly
by these presents.

Sealed with our seals and dated this _____ day of _____, A.D., _____.

WHEREAS, the above named principal has entered into a certain written Contract with
_____, dated this _____ of _____, A.D., _____, wherein the
said principal covenanted and agreed as follows, to wit:

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that by and under
said Contract, the above named principal has agreed, with the said **OWNER** that for a period of one
(1) year from the date of Substantial Completion, to keep in good order and repair any defect in all
the work done under said Contract either by the principal or their subcontractors, or their material
suppliers, that may develop during said period due to improper materials, defective equipment,
workmanship or arrangements, and any other work affected in making good such imperfections, shall
also be made good all without expense to the **OWNER**, excepting only such part or parts of said
work as may have been disturbed without the consent or approval of the principal after the final
acceptance of the work, and that whenever directed so to do by the **OWNER**, by notice service
WILL PROCEED at once to make such repairs as directed by the said **OWNER**; and in case of
failure to do so within one (1) week from the date of service of such notice, or within reasonable time
not less than one (1) week, as shall be fixed in said notice, then the said **OWNER** shall have the right
to purchase such materials and employ such labor and equipment as may be necessary for the
purpose, and to undertake, do and make such repairs, and charge the expense thereof to, and receive
same from said principal or surety.

If any repair is necessary to be made at once to protect life and property, then and in that case, the
said **OWNER** may take immediate steps to repair or barricade such defects without notice to the
CONTRACTOR. In such accounting the said **OWNER** shall not be held to obtain the lowest
figures for the doing of the work, or any part thereof, but all sums actually paid therefore shall be
charged to the principal or surety. In this connection the judgment of the said **OWNER** is final and
conclusive. The said principal for a period of one (1) year from the date of Substantial Completion,
shall keep said work so constructed under said contract in good order and repair, excepting only such
part or parts of said work which may have been disturbed with the consent or approval of said

principal after the final acceptance of the same, and shall whenever notice is given as hereinbefore specified, at once proceed to make repair as in said notice directed, or shall reimburse the said **OWNER** for any expense incurred by making such repairs, should the principal or surety fail to do as hereinbefore specified, and shall fully indemnify, defend and save harmless the said **OWNER** from all suits and actions for damage of every name and description brought or claimed against it for or on account of any injury or damage to person or property received or sustained by any party or parties, by or from any of the acts of omissions or through the negligence of said principal, servants, agents or employees in the prosecution of the work included in said contract, and from any and all claims arising under the Workmen's Compensation Act, so-called, of the State of Florida, then the above obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this _____ day of _____, A.D., _____.

Signed, sealed and delivered in the presence of:

_____	_____ (L.S.)
_____	_____ (L.S.)
_____	_____ (L.S.)

NOTE: Bond must show complete **NAME AND ADDRESS OF LOCAL AGENT AND HOME COMPANY**.

NOTICE OF AWARD

Dated _____

TO: _____ (BIDDER)

ADDRESS: _____

CONTRACT NO.: **ITB #11-006: ADVANCED TRAFFIC MANAGEMENT SYSTEM**

(ATMS), PHASE I

You are notified that your Bid dated _____ for the above Contract has been considered. You are the apparent Successful **BIDDER** and have been awarded a Contract for the above described Work.

The Contract Price for your Contract is _____ Dollars (_____).

One copy of each of the proposed Contract Documents (except Drawings) shall accompany this Notice of Award. Four sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within 10 days of the date you received this Notice of Award.

- Deliver to the **OWNER** one fully executed counterpart of the Contract Documents.
- Deliver with the executed Contract Documents the Contract security (Bonds) as specified in the Instructions to Bidders (Article 20), (and General Conditions (Paragraph 5.01) [and Supplementary Conditions (Paragraph SC-5.01].)
- Deliver with the executed Contract Documents the proof of required insurance coverage.

Failure to comply with these conditions within the time specified will entitle the **OWNER** to consider your Bid in default, to annul this Notice of Award, and to declare your Bid security forfeited.

EJCDC No. 1910-22 (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

After you comply with the above conditions, the **OWNER** will return to you one fully executed counterpart of the Contract Documents.

CITY OF OCALA

(OWNER)

By:

(Authorized Signature)

(Title)

Copy to ENGINEER

NOTICE TO PROCEED

Dated: _____

TO: _____
(Contractor)

ADDRESS: _____

CONTRACT NO.: **ITB #11-006: ADVANCED TRAFFIC MANAGEMENT SYSTEM**
(ATMS), PHASE I

You are notified that the Contract Times under the above contract will commence to run on _____. By that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the **AGREEMENT** the date of Substantial Completion is _____ and the date of readiness for final payment is _____.

Before you may start any Work at the Site, Paragraph 2.05.C of the General Conditions provides that you and the **OWNER** must each deliver to the other (with copies to the **CONSULTING ENGINEER** and other identified additional insureds) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

CITY OF OCALA
(OWNER)

By: _____
(Authorized Signature)

(Title)

Copy to ENGINEER

EJCDC No. 1910-22 (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

CERTIFICATE OF INSURANCE				Issue Date:	
PRODUCER:		THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.			
Code Sub-Code					
		COMPANIES AFFORDING COVERAGE			
INSURED:		COMPANY LETTER A			
		COMPANY LETTER B			
		COMPANY LETTER C			
		COMPANY LETTER D			
		COMPANY LETTER E			
COVERAGES					
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.					
CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE	POLICY EXPIRATION DATE	ALL LIMITS IN THOUSANDS
	GENERAL LIABILITY ☐ COMMERCIAL GENERAL LIABILITY ☐ OCCURRENCE ☐ BLANKET CONTRACTUAL ☐ _____	((Completed Operations & Products Liability remains in force for 2 years after final payment.)			GENERAL AGGREGATE
					PRODUCTS-COMP/OPS AGGREGATE
					PERSONAL & ADVERTISING INJURY
					EACH OCCURRENCE
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ HIRED AUTOS ☐ NON-OWNED AUTOS				COMBINED SINGLE LIMIT EACH OCCURRENCE (Bodily Injury & Property Damage)
	EXCESS LIABILITY ☐ UMBRELLA FORM	(Follows Form of the Primary)			EACH OCCURRENCE
					AGGREGATE
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY (Includes US Longshoremen and Harbor Workers Act And Maritime Coverage Where Applicable and All States Endorsement)				STATUTORY
					EACH ACCIDENT
					DISEASE-POLICY LIMIT
					DISEASE-EACH EMPLOYEE
	OTHER				
	☐ _____				AGGREGATE
DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS:					
1. Certificate Holder(s) & their Officers, Directors, Partners, Employees, & Agents Named as Additional Insured (all policies except WC). The coverage afforded the Additional Insured under these policies shall be primary Insurance. If the Additional Insured has other insurance which is applicable to the loss, such other Insurance shall be on an excess or contingent basis. (Copy of Additional Insured Endorsement attached.) 2. Blanket Coverage for XCU Hazards (General Liability & Excess Liability). 3. Waiver of Subrogation Against Certificate Holder(s), Their Officers, Directors, Partners, Employees, & Agents (all policies). 4. Contractual Coverage covers liability assumed in the Indemnification Clause of the Contract between Certificate Holder and Insured (General) 5. General and Products/Completed Operations aggregates apply for each Certificate Holder contract(s) or amendments (General Liability & Excess). 6. Contractual Liability Limitation Endorsement CG2139 or its equivalent is not included in either General or Excess Liability policies. 7. Severability of Interest or Cross Liability clause or endorsement included (General Liability & Excess Liability).					
CERTIFICATE HOLDERS			CANCELLATION		
1. 2. Owner:			SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELED, TERMINATED, OR MATERIALLY CHANGED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL MAIL 30 DAYS' WRITTEN NOTICE TO THE CERTIFICATE HOLDERS NAMED TO THE LEFT. ANY IMPAIRMENT OR EXHAUSTION OF AGGREGATES WILL BE SUBJECT OF IMMEDIATE NOTICE TO THE CERTIFICATE HOLDERS.		
			SIGNATURE OF AUTHORIZED AGENT OF THE COMPANY		

CERTIFICATE OF PROPERTY INSURANCE		ISSUE DATE _____ (mm/dd/yy)
THIS IS EVIDENCE THAT INSURANCE AS IDENTIFIED BELOW HAS BEEN ISSUED, IS IN FORCE, AND CONVEYS ALL THE RIGHTS AND PRIVILEGES AFFORDED UNDER THE POLICY.		
PRODUCER Code Sub-Code	COMPANY	
INSURED	POLICY NUMBER	
	EFFECTIVE DATE (mm/dd/yy)	EXPIRATION DATE (mm/dd/yy)
PROPERTY INFORMATION		
LOCATION/DESCRIPTION		
COVERAGE INFORMATION		
COVERAGES/PERILS/FORMS	AMOUNT OF INSURANCE	DEDUCTIBLE
BUILDERS RISK/INSTALLATION FLOATER All Risk of Physical Damage or Loss to Equipment and Materials at or incidental to the Site, on Completed Value Form.	Insurable value of completed Work	
REMARKS		
1. Certificate Holder and others identified in the property insurance paragraph of the Contract Documents are Named Insureds. 2. Waiver of Subrogation against Named Insureds. 3. Any similar insurance carried by Named Insureds is in excess of coverage described hereon. 4. Losses are payable to Owner as fiduciary for the Named Insureds.		
CANCELLATION		
THIS POLICY IS SUBJECT TO THE PREMIUMS, FORMS, AND RULES IN EFFECT FOR EACH POLICY PERIOD. SHOULD THE POLICY BE TERMINATED OR MATERIALLY CHANGED, THE COMPANY WILL GIVE THE CERTIFICATE HOLDERS IDENTIFIED BELOW 30 DAYS' WRITTEN NOTICE, AND WILL SEND NOTIFICATION OF ANY CHANGES TO THE POLICY THAT WOULD AFFECT THAT INTEREST, IN ACCORDANCE WITH THE POLICY PROVISIONS OR AS REQUIRED BY LAW.		
CERTIFICATE HOLDERS		
Name and Address 1. 2. Owner	Nature of Interest X Additional Named Insured	
	SIGNATURE OF AUTHORIZED AGENT OF THE COMPANY	

POWER OF ATTORNEY

STATE OF _____
COUNTY OF _____
CITY OF _____

The undersigned, a _____ under the laws of the State of
(Corporation, Partnership, Individual)

_____, having principal office of registered agent in Florida

at _____, hereby nominates, constitutes and appoints _____ with full

power to act _____ on behalf of _____
(Alone or in Conjunction with Another Person) (Name of Company)

to make, execute, seal and deliver on its behalf as the **CONTRACTOR** and as its act and deed, any and all contracts, change orders, monthly and final payment certifications and other like instruments as follows:

Such Contracts, change orders, monthly and final payment certificates and other like instruments shall be binding upon said company as fully and to all intents and purposes as if such instruments had been duly executed and acknowledged and delivered by the authorized officers of the company when duly executed, as indicated above, by either one of the aforementioned persons.

WITNESS OR ATTEST:

NAME OF COMPANY

Witness

Print By _____
Signature

Print

Title _____

Address _____

Date _____

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me this _____ day of _____, _____
by _____.

(Signature of Notary Public)

(Print, type, or stamp Commissioned Name of
Notary Public)

Personally Known ☐ **OR** Produced Identification ☐

Type of Identification produced: _____

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the secretary of the corporation named as principal in the foregoing bid bond; that _____ who signed the said bond on behalf of the principal was then _____ of said corporation; that I know their signature, and their signature thereto is genuine; and that said bond was duly signed, sealed and attested for and on behalf of said corporation by authority of its governing body.

Signature and Title

Print Name & Title

CORPORATE SEAL

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me this _____ day of _____, _____ by _____.

(Signature of Notary Public)

(Print, type, or stamp Commissioned Name of Notary Public)

Personally Known ☐ **OR** Produced Identification ☐

Type of Identification produced: _____

PARTIAL RELEASE OF LIENS

WHEREAS WE, THE SUBSCRIBERS have erected and furnished materials for the construction, lying and being in Marion County, State of **FLORIDA**, and described as follows:

PROJECT NAME

BID NO.

owned by the **CITY OF OCALA**,

and have agreed to release all liens which we, or any or either of us have, or might have on the said premises by reason of the materials furnished, or work performed through _____
(date)

thereon; and that we have received **ALL MONIES OWED TO DATE** through _____
from _____ for materials furnished or work performed thereon;

NOW THEREFORE WE, the subscribers, for and in consideration of the premises, hereby acknowledge, have remised, released and forever quit-claim unto the said **OWNER** all and all manner of liens, claims and demands whatsoever which we, or either of us now have, or might or could have, on or against the said premises for work done or for material furnished, and also for all work or material which may hereafter be done or furnished, on the said premises, or therewith, howsoever; so that the said **OWNER** shall or may have, hold and enjoy the said premises free and discharged from all liens, claims, and demands whatsoever, which we, or either of us, now have, or might or could have on or against the said premises if these presents had not been made. We, the subscribers, severally warrant that all laborers employed by us or any of us upon the above described premises have been fully paid, and that none of such laborers have any claim, demand or lien against said property, and further warrant that no chattel mortgage, condition sale or retention of title contract has been given or executed by any of the subscribers, hereto, for or in connection with any material, fixtures, machinery, appliances or furnishings, and we further warrant that we or any of us have not assigned, pledged or hypothecated any claims or rights to payment due us hereunder, and that we, or any of us, have full right and authority to execute this release and waiver of lien.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on the date written.

DATE: _____
CONTRACTOR: _____
BY: _____
PRINT: _____
TITLE: _____
TYPE OF SERVICES: _____
AMOUNT OF SERVICES RENDERED: \$ _____
DATE PAID THROUGH: _____

STATE OF FLORIDA }
COUNTY OF _____ }

I, _____, being first duly sworn on oath, depose and say that the persons, firms and corporations who have executed the above **RELEASE** are all the persons, firms and corporations who have furnished, or are under Contract to furnish, services, labor or materials in the construction or repair of the premises described in the above **PARTIAL RELEASE OF LIENS**. This affidavit is made with full knowledge of the Statutes of Florida and the penalties provided therein.

Signature, General Contractor

Printed Name

STATE OF FLORIDA
COUNTY OF _____

Sworn to (or affirmed) and subscribed before me this ____ day of _____, ____ by _____.

(Signature of Notary Public)

(Print, type, or stamp Commissioned Name of
Notary Public)

Personally Known ☐ OR Produced Identification ☐

Type of Identification produced:_____

SUBCONTRACTOR/MATERIAL SUPPLIER:

NAME: _____

ADDRESS: _____

THIS INSTRUMENT PREPARED BY:

NAME/TITLE

FINAL RELEASE OF LIENS

WHEREAS WE, THE SUBSCRIBERS, have erected and furnished materials for the construction, lying and being in Marion County, State of **FLORIDA**, and described as follows:

PROJECT NAME

BID NO.

owned by the **CITY OF OCALA**,

and have agreed to release all liens which we, or any or either of us have, or might have on the said premises by reason of the materials furnished, or work performed thereon;

NOW THEREFORE WE, the subscribers, for and in consideration of the premises, hereby acknowledge, have remised, released and forever quit-claim unto the said **OWNER** all and all manner of liens, claims and demands whatsoever which we, or either of us now have, or might or could have, on or against the said premises for work done or for material furnished, and also for all work or material which may hereafter be done or furnished, on the said premises, or otherwise, howsoever; so that the said **OWNER** shall or may have, hold and enjoy the said premises free and discharged from all liens, claims, and demands whatsoever, which we, or either of us, now have, or might or could have on or against the said premises if these presents had not been made. We, the subscribers, severally warrant that all laborers employed by us or any of us upon the above described premises have been fully paid, and that none of such laborers have any claim, demand or lien against said property, and further warrant that no chattel mortgage, condition sale or retention of title contract has been given or executed by any of the subscribers, hereto, for or in connection with any material, fixtures, machinery, appliances or furnishings, and we further warrant that we or any of us have not assigned, pledged or hypothecated any claims or rights to payment due us hereunder, and that we, or any of us, have full right and authority to execute this release and waiver of lien.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on the date written.

DATE: _____
CONTRACTOR: _____
BY: _____
PRINT: _____
TITLE: _____
TYPE OF SERVICES: _____
AMOUNT OF SERVICES RENDERED: \$ _____

STATE OF FLORIDA }
COUNTY OF _____}

I, _____, being first duly sworn on oath, depose and say that the persons, firms and corporations who have executed the above **RELEASE** are all the persons, firms and corporations who have furnished, or are under contract to furnish, services, labor or materials in the construction or repair of the premises described in the above **FINAL RELEASE OF LIENS**. This affidavit is made with full knowledge of the Statutes of Florida and the penalties provided therein.

Signature, General Contractor

Printed Name

STATE OF FLORIDA
COUNTY OF MARION

Sworn to (or affirmed) and subscribed before me this ____ day of _____, ____ by _____.

(Signature of Notary Public)

(Print, type, or stamp Commissioned Name of Notary Public)

Personally Known ☐ **OR** Produced Identification ☐

Type of Identification produced: _____

CERTIFICATION OF LIENS PAID

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public in and for the
County and State aforesaid, do hereby certify that _____
personally appeared before me in my said County this day and after being duly sworn by me did
depone and say that they have completed the Contract entitled **BID No. ITB #11-006: ADVANCED
TRAFFIC MANAGEMENT SYSTEM (ATMS), PHASE I**, City of Ocala, Florida, and that the
said **CONTRACTOR** has paid all wages due and has paid for all materials furnished in and about
the construction of said Contract and has paid all damages and claims whatsoever, including claims
by reason of the manner of construction and that there are no unpaid claims whatsoever upon account
thereof.

Witness

Signature of Deponent

Print

Print

Witness

Print

STATE OF FLORIDA
COUNTY OF MARION

Sworn to (or affirmed) and subscribed before me this ____ day of _____, ____ by
_____.

(Signature of Notary Public)

(Print, type, or stamp Commissioned Name of
Notary Public)

Personally Known ☐ **OR** Produced Identification ☐

Type of Identification produced: _____

SUPPLEMENTARY CONDITIONS

GENERAL: General Conditions for this project are found in Volume I, City of Ocala “General Conditions for Construction.”

SCOPE: These Supplementary Conditions amend or supplement the General Conditions and other provisions of the Contract Documents as indicated herein. All provisions which are not so amended or supplemented remain in full force and effect.

SC- 1 DEFINITIONS AND TERMINOLOGY

SC-1.01 Defined Terms

A. Add the following definitions to Paragraph 1.01A of the General Conditions:

1. As Approved – The words “as approved”, unless otherwise qualified, shall be understood to be followed by the words “by the **OWNER** in conformance with the CONTRACT DOCUMENTS.”
2. As Shown, As Indicated – The words “as shown” and “as indicated” shall be understood to be followed by the words “on the Drawings”.
3. Bidder – Any person or persons, partnership, firm, or corporation submitting a bid for the work contemplated.
4. City – City of Ocala, Marion County, Florida. The term “**CITY**” and “**OWNER**” are interchangeable and shall have the same meaning in the Contract Documents.
5. City Council – The governing body of the City of Ocala.
6. City Engineer – Florida registered professional engineer who is the head of the City of Ocala Engineering Department.
7. Contract Completion – The “Contract Completion” is the date the **OWNER** accepts the entire work as being in compliance with the CONTRACT DOCUMENTS, or formally waives non-conforming work to the extent of non-conformity, and issues the final payment in accordance with the requirements set forth.
8. Design Engineer –Tindale-Oliver & Associates Inc., 1000 N. Ashley Drive-Suite 100, Tampa, Florida 33602 and their duly authorized agents, such agents acting within the scope of the particular duties entrusted to them in each case, shall be the **CONSULTING ENGINEER**.

9. Engineer – The term the “**ENGINEER**” shall refer to the **OWNER** and the **CONSULTING ENGINEER** or Resident Project Representative.
10. Float – The amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any of the activities in the progress schedule.
11. Modification – (a) A written amendment to the **CONTRACT DOCUMENTS** signed by both parties, (b) a change order, (c) a written clarification or interpretation issued by the **OWNER** in accordance with Paragraph 9.04 of the General Conditions, and (d) a written order for a minor change or alteration in the work issued by the **OWNER** pursuant to Paragraph 9.05 of the General Conditions. A modification may only be issued after execution of the **AGREEMENT**.
12. Notice – The term “notice” or the requirement to notify, as used in the **CONTRACT DOCUMENTS** or applicable state or federal statutes, shall signify a written communication delivered in person or by Certified or Registered Mail to the individual, or to a member of the firm, or to an officer of the corporation for whom it is intended. Certified or Registered Mail shall be addressed to the last business address known to those who give notice.
13. Owner Procured Materials – Those items of material, supplies, or equipment deemed by the **CITY** to be purchased directly from the vendor by the **CITY** to save sales tax only. These items shall be referred to as the “**OWNER Procured Materials**” or the “**OWNER Procured Materials, Supplies, and Equipment**.” The **CONTRACTOR** is responsible for ordering, submittals, delivery, installation, and warranty.
14. Proposal – The terms “Proposal” and “Bid” are interchangeable and shall have the same meaning in the Contract Documents.
15. Provide – The **CONTRACTOR** shall furnish and install, complete and in place.
16. Resident Project Representative – In lieu of the definition set forth in Paragraph 1.01A.37 of the General Conditions, the Resident Project Representative shall be the authorized representative of the **OWNER**, who may be assigned to the site or any part thereof.
17. State – State of Florida.
18. Surety – Any person, firm, or corporation that has executed, as Surety, and of the **CONTRACTOR’S** bonds securing the performance of the contract.

19. Without Exception – The term “without exception”, when used in the Contract Documents following the name of a supplier or a proprietary item of equipment, product, or material, shall mean that the sources of the product are limited to the listed suppliers or products and that no like, equivalent, or “or-equal” item and no substitution will be permitted.
20. Day – A calendar day of twenty-four (24) hours measured from one midnight to the next midnight.

SC-2 PRELIMINARY MATTERS

- SC-2.03 Commencement of Contract Times; Notice to Proceed – Delete the last sentence of Paragraph 2.03A of the General Conditions and add the following new sentence:

In no event will the Contract Times commence to run later than 90 days after the day of the bid opening or 30 days after the effective date of the **AGREEMENT**, whichever date is earlier.

SC-3 CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

- SC-3.05 Reuse of Documents – Delete Paragraph 3.05A of the General Conditions and replace with the following:

The **CONTRACTOR** and any subcontractor or supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with the **OWNER**: (I) shall not have or acquire any title to or ownership rights in any of the drawings, specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of the **ENGINEER** or **CONSULTING ENGINEER**, including electronic media editions; and (ii) shall not reuse any such drawings, specifications, other documents, or copies thereof on extensions of the project or any other project without written consent of the **OWNER** and the **CONSULTING ENGINEER** and specific written verification or adaptation by the **OWNER** and **CONSULTING ENGINEER**. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude the **CONTRACTOR** from retaining copies of the Contract Documents for record purposes.

SC-4 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS;
REFERENCE POINTS

SC-4.02 Subsurface and Physical Conditions

A. Reports and Drawings

1. Add the following new paragraph immediately after Paragraph 4.02A.1 of the General Conditions:

In preparation of the Contract Documents, the following drawings of physical conditions in or relating to existing surface and subsurface structures (except underground facilities) which are at or contiguous to the Site of Work were relied upon:

- a. Drawings dated: January, 2011
Prepared by: Tindale-Oliver & Associates Inc./ DKS Associates
Titled: Advanced Traffic Management System, Phase I,
Design

2. Add the following new paragraph immediately after Paragraph 4.02A.2 of the general conditions

B. Limited reliance by the **CONTRACTOR** on Technical Data Authorized.

Add the following new paragraph immediately after Paragraph 4.02B of the General Conditions:

It shall be understood that the information provided is not guaranteed by the **OWNER** or the **CONSULTING ENGINEER**, to be more than a general indication of the physical conditions likely to be found.

SC-4.04 Underground Facilities

- A. Shown or Indicated. Delete Paragraph 4.04A of the General Conditions in its entirety and replace with the following:

Shown or Indicated: the information and data shown or indicated in the Contract Documents with respect to existing underground facilities at or contiguous to the site are based on information and data furnished to the **OWNER** or **CONSULTING ENGINEER** by the **OWNERS** of such underground facilities, including the **OWNER**, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. The **OWNER** and the **CONSULTING ENGINEER** shall not be responsible for the accuracy or completeness of any such information or data; and
2. The cost of all of the following shall be included in the Contract Price and the **CONTRACTOR** shall have full responsibility for:
 - a. Reviewing and checking all such information and data,
 - b. Locating all underground facilities shown or indicated in the Contract Documents,
 - c. Coordination of the Work with the **OWNER** of such Underground Facilities, including the **OWNER**, during construction, and
 - d. The safety and protection of all such underground facilities and repairing any damage thereto resulting from the Work.

- B. Not Shown or Indicated. Delete Paragraph 4.04B of the General Conditions in its entirety and replace with the following:

Not Shown or Indicated

1. If an underground facility is uncovered or revealed at or contiguous to the site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, the **CONTRACTOR** shall, promptly after becoming aware thereof and before further disturbing

conditions affected thereby or performing any Work in connection therewith (except in and emergency as required by Paragraph 6.16A), identify the **OWNER** of such underground facility and give written notice to that **OWNER** and to the **OWNER** and the **CONSULTING ENGINEER**. The **CONSULTING ENGINEER** will promptly review the underground facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the underground facility. During such time, the **CONTRACTOR** shall be responsible for the safety and protection of such underground facility.

2. If the **CONSULTING ENGINEER** concludes that a change in the Contract Documents is required, a work change directive or a change order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence of location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and the **CONTRACTOR** did not know of and could not reasonably have been expected to be aware of or to have anticipated. If the **OWNER** and the **CONTRACTOR** are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, the **OWNER** or the **CONTRACTOR** may make a claim therefore as provided in Paragraph 10.05.

SC-5 BONDS AND INSURANCE

Delete Article 5 of the General Conditions in its entirety, and insert the following text in its place:

ARTICLE 5 – BONDS AND INSURANCE

SC-5.01 Performance, Payment, and Other Bonds

- A. The **CONTRACTOR** shall furnish Performance and Payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all the **CONTRACTOR'S** obligations under the Contract Documents. These bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by laws or regulations or by the Contract Documents. The **CONTRACTOR** shall also furnish such other Bonds as are required by the Contract Documents.

- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by laws or regulations, and shall be executed by such sureties as are named in the current list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies: as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U. S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of such agent’s authority to act.
- C. If the surety on any bond furnished by the **CONTRACTOR** is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the project is located or it ceases to meet the requirements of Paragraph 5.01B, the **CONTRACTOR** shall within 20 days thereafter substitute another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01B and 5.02.

SC-5.02 Licensed Sureties and Insurers

All bonds and insurance required by the Contract Documents to be purchased and maintained by the **OWNER** or the **CONTRACTOR** shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

SC-5.03 Certificates of Insurance

- A. The **CONTRACTOR** shall deliver to the **OWNER**, with copies to each additional insured, certificates of insurance (and other evidence of insurance requested by the **OWNER** or any other additional insured) that the **CONTRACTOR** is required to purchase and maintain. The **OWNER** shall deliver to the **CONTRACTOR**, with copies to each additional insured, certificates of insurance (and other evidence of insurance requested by the **CONTRACTOR** or any other additional insured) that the **OWNER** is required to purchase and maintain.
- B. Certificates of insurance shall be submitted on the forms included in the Contract Documents.

SC-5.04 Contractor’s Liability Insurance

- A. The **CONTRACTOR** shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from the **CONTRACTOR’S** performance of the Work and the **CONTRACTOR’S**

other obligations under the Contract Documents, whether it is to be performed by the **CONTRACTOR**, and subcontractor or supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. Claims under workers' compensation, disability benefits, and other similar employee benefit acts;
2. Claims for damages because of bodily injury, occupational sickness or disease, or death of the **CONTRACTOR'S** employees;
3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the **CONTRACTOR'S** employees;
4. Claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by the **CONTRACTOR**, or (ii) by any other person for any other reason;
5. Claims for damages, other than the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom;
6. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle; and
7. Claims for damages caused by negligent error, omission, or act for which the insured party is legally liable, arising out of the performance of specified professional design services.

B. The policies of insurance so required by this Paragraph 5.04 to be purchased and maintained shall:

1. With respect to insurance required by Paragraphs 5.04A.3 through 5.04A.6 inclusive, include as additional insureds (subject to any customary exclusion in respect to professional liability) the **OWNER**, the **CONSULTING ENGINEER**, and any other individuals listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. Include at least the specific coverages and be written for not less than the limits of liability specified or required by laws or regulations, whichever is greater;

3. Include completed operations insurance;
 4. Include contractual liability insurance covering the **CONTRACTOR'S** indemnity obligations under Paragraphs 6.07, 6.11, and 6.20;
 5. Contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to the **OWNER** and the **CONTRACTOR** and to each other additional insured to whom a certificate of insurance had been issued (and the certificates of insurance furnished by the **CONTRACTOR** pursuant to Paragraph 5.03 shall so provide);
 6. Remain in effect at least until final payment and at all times thereafter when the **CONTRACTOR** may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07;
 7. With respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two (2) years after final payment (and the **CONTRACTOR** shall furnish the **OWNER** and each other additional insured to whom a certificate of insurance has been issued, evidence satisfactory to the **OWNER** and any such additional insured of continuation of such insurance at final payment and one (1) year thereafter);
 8. Contain a cross liability or severability of interest clause or endorsement. Insurance covering the specified additional insureds shall be primary insurance, and all other insurance carried by the additional insureds shall be excess insurance; and
 9. With respect to workers' compensation and employers' liability, comprehensive automobile liability, commercial general liability, and umbrella liability insurance, and all other liability insurance specified herein to be provided by the **CONTRACTOR**, the **CONTRACTOR** shall required its insurance carriers to waive all rights of subrogation against the **OWNER**, the **CONSULTING ENGINEER**, and their respective officers, directors, partners, employees, and agents.
- C. Worker's Compensation and Employer's Liability Insurance – This insurance shall protect the **CONTRACTOR** against all claims under applicable workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. The **CONTRACTOR** shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all states" or "other states" endorsement.

The liability limits shall be not less than:

Workers' compensation	Statutory
Employers' liability	\$1,000,000 each occurrence

- D. Comprehensive Automobile Liability Insurance – This insurance shall be occurrence type, written in comprehensive form, and shall protect the **CONTRACTOR, OWNER, and CONSULTING ENGINEER** as additional insureds, against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, either on or off the project site whether they are owned, non-owned, or hired.

The liability limits shall be not less than:

Bodily injury and property Damage	\$1,000,000 combined single limit for each occurrence
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- E. Commercial General Liability Insurance – This insurance shall be occurrence type, written in comprehensive form, and shall protect the **CONTRACTOR, OWNER, and CONSULTING ENGINEER** as additional insureds, against claims arising from injuries, sickness, disease, or death of any person or damage to property arising out of performance of the Work. The policy shall also include a per project aggregate limit endorsement, personal injury liability coverage, contractual liability coverage, completed operations and products liability coverage, and coverage for blasting, explosion, collapse of buildings, and damage to underground property.

The liability limits shall be not less than:

Bodily injury and property Damage	\$1,000,000 combined single limit for each occurrence
	\$1,000,000 general aggregate

- F. Professional Liability Insurance – This insurance shall be required only in cases where the Contract Documents specifically required that the **CONTRACTOR** provide for design services to be performed by a professional engineer with appropriate expertise in accordance with applicable laws and regulations, licensed or registered in the State of Florida, and that the shop drawings or other evidence of design bear the seal and signature of that professional engineer. This insurance shall provide protection against claims arising out of performance of professional design services and caused by a negligent error, omission, or act for which the insured party is legally liable; such professional liability insurance shall provide coverage in the amount of \$1,000,000 and shall be maintained throughout the duration of the project and for one year after Substantial Completion.

In the event that the professional design services are performed by an independent consultant or subcontractor engaged by the **CONTRACTOR**, this insurance shall be furnished and maintained by the independent consultant or subcontractor. In the event that the professional design services are performed by a member of the **CONTRACTOR'S** organization, this insurance shall be furnished and maintained by the **CONTRACTOR**.

A certificate of insurance for such professional liability insurance coverage, including the amount, duration, and name of the insured party, shall be delivered to the **OWNER** and the **CONSULTING ENGINEER**.

SC-5.05 Property Insurance

- A. The **CONTRACTOR**, with sole liability for payment of premiums, shall purchase and maintain property insurance upon the Work at the site in the amount of the full replacement cost thereof. This insurance shall:
1. Include the interests of the **OWNER**, **CONTRACTOR**, subcontractors, **CONSULTING ENGINEER**, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a named insured;
 2. Be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, flood, and damage caused by frost and freezing;
 3. Include expenses incurred in the repair or replacement of any insured property (including, but not limited to, fees and charges of engineers and architects);
 4. Cover materials and equipment stored at the site or at another location that was agreed to in writing by the **OWNER** prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by the **OWNER** or the **CONSULTING ENGINEER**;
 5. Allow for partial utilization of the Work by the **OWNER**;
 6. Include testing and startup; and

7. Be maintained in effect until final payment is made unless otherwise agreed to in writing by the **OWNER**, **CONTRACTOR**, and **CONSULTING ENGINEER**, with 30 days written notice to each other named insured to whom a certificate of insurance has been issued.
- B. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.05 shall contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to the **OWNER** and the **CONTRACTOR** and to each other additional insured to whom a certificate of insurance has been issued, and shall contain waiver provisions in accordance with Paragraph 5.06.
- C. If the **OWNER** requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.05, the **CONTRACTOR** shall, if possible, include such insurance, and the cost thereof will be charged to the **OWNER** by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the site, the **CONTRACTOR** shall in writing advise the **OWNER** whether or not such other insurance has been procured by the **CONTRACTOR**.

SC-5.06 Waiver of Rights

- A. The **OWNER** and the **CONTRACTOR** intend that all policies purchased in accordance with Paragraph 5.05 will protect the **OWNER**, **CONTRACTOR**, subcontractors, **CONSULTING ENGINEER**, (and the officers, public officials, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the named insureds thereunder.

The insurance coverage limits required hereunder are mandatory minimums and neither the **OWNER** nor the **CONSULTING ENGINEER** are representing that the insurance limits required by this agreement are adequate to protect the **CONTRACTOR**, or its officers, employees, agents or subcontractors. The **CONTRACTOR** remains legally responsible for all damages suffered by the **OWNER** for which the **CONTRACTOR** is legally responsible regardless of whether the insurance procured is adequate or not.

- B. Any insurance policy covering any loss, damage, or consequential loss referred to in Paragraph 5.06B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against **OWNER**, **CONTRACTOR**, subcontractors, **CONSULTING ENGINEER**, or the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.

SC-5.07 Receipt and Application of Insurance Proceeds

- A. Any insured loss under the policies of insurance required by Paragraph 5.05 will be adjusted with the **OWNER** and made payable to the **OWNER** as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.07B. The **OWNER** shall deposit in a separate account any money so received and shall distribute it in accordance with such **AGREEMENT** as the parties in interest may reach. If no other special **AGREEMENT** is reached, the damaged Work shall be repaired or replaced, the monies so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.
- B. The **OWNER** as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to the **OWNER'S** exercise of power. If such objection be made, the **OWNER** as fiduciary shall make settlement with the insurers in accordance with such **AGREEMENT** as the parties in interest may reach. If no such **AGREEMENT** among the parties in interest is reached, the **OWNER** as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, the **OWNER** as fiduciary shall give bond for the proper performance of such duties.

SC-5.08 Acceptance of Bonds and Insurance; Option to Replace

If either the **OWNER** or **CONTRACTOR** has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.05C. The **OWNER** and the **CONTRACTOR** shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required by such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a change order shall be issued to adjust the Contract Price accordingly.

SC-5.09 Partial Utilization, Acknowledgment of Property Insurer

If the **OWNER** finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.05 have acknowledged notice thereof and in writing

effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

SC-6 CONTRACTOR'S RESPONSIBILITIES

SC-6.02 Labor; Working Hours

Add the following new paragraphs immediately after Paragraph 6.02B of the General Conditions:

- C. No Work shall be done between 6 p.m. and 7 a.m. without permission of the **OWNER**. However, emergency work may be done without prior permission.
- D. Night Work may be undertaken as a regular procedure with the permission of the **OWNER**; such permission, however, may be revoked at anytime by the **OWNER** if the **CONTRACTOR** fails to maintain adequate equipment and supervision for the proper prosecution and control of the Work at night.
- E. Unless otherwise agreed upon by the **OWNER**, work hours for the **CONTRACTOR** shall be the same as those hours normally worked by the **OWNER'S** personnel. If the **CONTRACTOR** desires to work outside the normal working hours of the **OWNER**, or in excess of forty (40) hours per week, or on Saturdays, Sundays, of the **OWNER** observed holidays, the **CONTRACTOR** must make advance application to, and obtain approval from, the **OWNER** (allowing at least forty-eight [48] hours prior to the time of such work) to enable satisfactory arrangements to be made for inspecting the work in progress and coordination with other city departments. If granted permission for such work outside the normal working hours, the **CONTRACTOR** shall work in a manner satisfactory to the **OWNER** and shall comply with all regulations. The **CONTRACTOR** shall be responsible for the cost of all **OWNER** services, including, but not necessarily limited to: overtime salaries, salary taxes and benefits, professional services, and all other costs incurred by the **OWNER** as a result of work being performed outside the normal working hours of the **OWNER**. The **CONTRACTOR** shall reimburse the **OWNER** from payments due the **CONTRACTOR**. Normal working hours and holidays refers to the normal working hours and holidays as recognized by the **OWNER**.

SC-6.03 Services, Materials, and Equipment

Add the following new paragraph immediately after Paragraph 6.03B of the General Conditions:

- C. Until final completion of the Work is acknowledged by the **OWNER**, the **CONTRACTOR** shall have responsible charge and care of the Work and of all equipment and materials to be used herein, and shall bear the risk of injury,

loss, or damage to any part thereof by action of the elements or from any other cause, whether arising from the execution or non-execution of the Work.

- D. The **CONTRACTOR** shall rebuild, repair, restore, and make good all injuries, losses, or damages to any portion of the Work or the equipment or materials occasioned by any cause before completion and acceptance of the Work and shall bear the expense therefore. The **CONTRACTOR** shall, at no additional cost to the **OWNER**, provide suitable drainage and suitable structures as necessary to protect the Work or any portion thereof from damage.
- E. Suspension of the Work or the granting of an extension of time for any cause whatever shall not relieve the **CONTRACTOR** of their responsibilities for the Work as specified

SC-6.06 Concerning Subcontractors, Suppliers, and Others

Delete Paragraph 6.06B of the General Conditions in its entirety and insert the following text in its place:

- B. If the Bidding Documents or the Contract Documents require the identity of certain subcontractors, suppliers, or other individuals or entities to be submitted to the **OWNER** in advance for acceptance by the **OWNER** by a specified date prior to the effective date of the **AGREEMENT**, and if the **CONTRACTOR** has submitted a list thereof in accordance with the Bidding Documents or Contract Documents, the **OWNER'S** acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such subcontractor, supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. The **CONTRACTOR** shall submit an acceptable replacement for the rejected subcontractor, supplier, or other individual or entity and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate change order will be issued or written amendment signed. No acceptance by **OWNER** or **CONSULTING ENGINEER**, of any such subcontractor, supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of the **OWNER** or the **CONSULTING ENGINEER**, to reject defective Work.
- C. Particular consideration will be given to the qualifications of each subcontractor proposed on the list of subcontractors. The use of subcontractors proposed by the **BIDDER** and accepted by the **OWNER** prior to the Notice of Award will be required in the performance of the Work unless otherwise permitted or directed by the **OWNER**.

SC-6.08 Permits

Add the following new paragraph immediately after Paragraph 6.08A of the General Conditions:

B. **OWNER** will obtain and pay for the following permits:

1. Florida Department of Transportation (F.D.O.T.) Construction Permit

SC-6.09 Laws and Regulations

Modify Paragraph 6.09C of the General Conditions and add the subsequent paragraphs as follows:

C. At the end of Paragraph 6.09C of the General Conditions, add the following sentences:

The provisions of Paragraph 6.09C of the General Conditions shall not apply to any changes to prevailing wage rates. Changes to wage rates during the life of the Contract shall be the responsibility of the **CONTRACTOR**, and shall not be eligible for claims for changes to the Contract Price.

D. Buy American Provision – The Buy American Provision of Public Law 95-217 (Section 215 of Public Law 92-500 as amended), as implemented by EPA regulations and guidance, generally requires that preference be given to the use of domestic construction material in the performance of this Contract.

E. Work in Confined Spaces – The provisions of 29 CFR Section 1910.146, “Permit-Required Confined Spaces”, have been adopted by the **OWNER** and shall apply to Work under this contract. The **OWNER** has established a confined-space entry program for its own use, and will be responsible for enforcement of the program for the **OWNER’S** personnel only.

The **CONTRACTOR** is hereby notified that manholes and other structures included under the confined-space definition of 29 CFR 1910.146, shall be considered as hazardous locations with hazardous atmospheric conditions. The structures may contain methane, hydrogen sulfide, carbon dioxide, and other gases which are dangerous to life or health. The **CONTRACTOR** shall allow its personnel or subcontractors to enter these confined spaces only through compliance with an entry permit program as specified herein.

The **CONTRACTOR** shall establish and maintain a confined-space entry program appropriate to the structures and conditions encountered. The program shall meet the requirements of 29 CFR 1910.146 and shall specifically address the provisions of Paragraph (d) therein. The **CONTRACTOR** shall enforce the requirements of Paragraphs (e) and (f), shall establish and conduct a training program in accordance with Paragraph (g), and shall comply with all other applicable requirements of the referenced regulation.

SC-6.19 Contractor's General Warranty and Guarantee

Delete Paragraph 6.19B.8 of the General Conditions and replace with the following Paragraphs 6.19B.8 and 6.19B.9:

8. Any correction of defective Work by the Owner; or
9. Any expiration of a correction period.

SC-6.20 Indemnification

Delete Paragraph 6.20 of the General Conditions in its entirety and replace with the following:

SC-6.20 Indemnification

- A. To the fullest extent permitted by laws and regulations, the **CONTRACTOR** shall defend, indemnify, and hold harmless the **OWNER**, and the **CONSULTING ENGINEER**, subconsultants of any tier, and the officers, public officials, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including, but not limited to, all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:
 1. Is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, and
 2. Is caused in whole or in part by any negligent act or omission of the **CONTRACTOR**, subcontractor, and supplier, any individual or entity directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by laws and regulations regardless of the negligence of any such individual or entity.
- B. The indemnification requirement set forth in Section 6.20 A above does not require that the **CONTRACTOR** indemnify the **OWNER** or **CONSULTING ENGINEER** for damages to persons or property caused in whole or in part by any act, omission, or default of the **CONTRACTOR** other than:

1. The **CONTRACTOR**
 2. Any of the **CONTRACTOR'S** subcontractors, subcontractors materialmen, or agents of any tier or their respective employees; or
 3. The **OWNER** or **CONSULTING ENGINEER** or their officers, directors, agents, or employees. However, such indemnification shall not include claims of, or damages resulting from, gross negligence, or willful, wanton or intentional misconduct of the **OWNER** or **CONSULTING ENGINEER** or their officers, directors, agents or employees, or for statutory violation or punitive damages except and to the extent the statutory violation or punitive damages are caused by or result from the acts or omissions of the **CONTRACTOR** or any of the **CONTRACTOR'S** subcontractors, subcontractors materialmen, or agents of any tier of their respective employees.
- C. The indemnification required herein is limited to \$5,000,000.00, which **OWNER, CONTRACTOR** and **CONSULTING ENGINEER** agree bears a reasonable commercial relationship to the contract and is part of the project specifications or bid documents.
- D. In any and all claims against the **OWNER** or the **CONSULTING ENGINEER**, or any of their respective consultants, agents, officers, public officials, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of the **CONTRACTOR**, any subcontractor, any supplier, any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the **CONTRACTOR** or any such subcontractor, supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- E. The indemnification obligations of the **CONTRACTOR** under Paragraph 6.20A shall not extend to the liability of the **CONSULTING ENGINEER**, or to the officers, public officials, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:
1. The preparation or approval of, or the failure to prepare or approve, maps, drawings, opinions, reports, surveys, change orders, designs, or Specifications; or
 2. Giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

SC-8 OWNER'S RESPONSIBILITIES

SC-8.12 Additional Owner's Responsibilities

The **OWNER** will provide the following permits:

- Florida Department of Transportation (F.D.O.T.) Construction Permit

SC-9 ENGINEER'S STATUS DURING CONSTRUCTION

SC-9.03 Project Representative

Add the following new paragraph immediately after Paragraph 9.03A of the General Conditions:

- B. The duties, responsibilities, and limitation of authority of the Resident Project Representative (provided by the **OWNER**) will be issued prior to the Pre-construction Conference.

SC-9.09 Decisions on Requirements of Contract Document and Acceptability of Work

Add the following new works at the end of the first sentence of Paragraph 9.09A of the General Conditions:

...insofar as the subject matter of any pertinent claim, dispute, or other matter falls within the realm of the technical expertise of the **ENGINEER**.

Add the following new sentence at the end of Paragraph 9.09A of the General Conditions:

The **ENGINEER** shall not render any decision on any claims, disputes, or other matters which, at the **ENGINEER'S** sole discretion, requires legal, rather than technical, interpretation.

SC-11 COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

SC-11.03 Unit Price Work

Add the following new paragraph immediately after Paragraph 11.03C of the General Conditions:

- D. The unit price of an item of Unit Price Work shall be subject to re-evaluation and adjustment by Change Order if the variation in the actual quantity of an item of Unit Price Work performed by the **CONTRACTOR** differs by more than 25% from the estimated quantity of that item indicated in the Bid.

SC-12 CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

SC-12.02 Change of Contract Times

Add the following new paragraphs after paragraph 12.02B of the General Conditions:

- C. A claim for an extension of the Contract Times (or Milestones), otherwise allowable under the Contract Documents, shall be granted only to the extent the time lost exceeds the float for the delayed activity at the time of the event giving rise to the claim. Float, whether expressly disclosed or implied in any manner, is jointly owned by the project participants.
- D. The **CONTRACTOR** shall not use float suppression techniques (including, but not limited to, preferential sequencing caused by late starts of follow-up trades, unreasonably small crews, extended durations, or imposed dates) in information provided to the **ENGINEER**.

SC-12.06 Delay Damages

Delete Paragraph 12.06B of General Conditions in its entirety.

SC-13 TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

SC-13.07 Correction Period

Add the following new paragraph immediately after paragraph 13.07D of the General Conditions:

- E. Nothing in this Article 13 concerning the correction period shall establish a period of limitation with respect to any other obligation which the **CONTRACTOR** has under the Contract Documents. The establishment of time periods relates only to the specific obligations of the **CONTRACTOR** to correct the Work, and has no relationship to the time within which the **CONTRACTOR'S** obligations under the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the **CONTRACTOR'S** liability with respect to the **CONTRACTOR'S** obligations other than to specifically correct the Work.

SC-14 PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.02 Progress Payments

Add the following new paragraphs immediately following Paragraph 14.02A.3 of the General Conditions:

4. Materials and Equipment. Payments for stored materials and equipment shall be based only upon the actual cost to the **CONTRACTOR** of the materials and equipment and shall not include any overhead or profit to the **CONTRACTOR**.

Partial payments will not be made for undelivered materials or equipment.

5. Schedules and Date. During the progress of the Work, each Application for Payment shall be accompanied by the **CONTRACTOR'S** updated schedule of operations or progress report, with such shop drawings schedules, procurement schedules, values of materials, and equipment on hand included in application, and other data specified or reasonably required by the **CONSULTING ENGINEER**.

SC-14.04 Substantial Completion

Add the following new paragraphs immediately after Paragraph 14.04A of the General Conditions:

“Substantial Completion” means that the facilities are completed to the point that the CCTV Cameras, Scrolling Mylar / Flashing signs are operational and traffic monitoring stations can count vehicles using the roadway and that the quantity and quality is satisfactory to the **OWNER** and the **ENGINEER**. All process equipment shall be installed and operational or temporary arrangements satisfactory to the **OWNER** shall have been made.

SC-14.07 Final Payment

Add the following new sentence at the end of Paragraph 14.07A.2 of the General Conditions:

Consent of the surety, signed by an agent, must be accompanied by a certified copy of such agent's authority to act for the surety.

SC-16 DISPUTE RESOLUTION

Delete Article 16 of the General Conditions in its entirety and insert the following text in its place:

ARTICLE 16 - DISPUTE RESOLUTION

SC-16.01 Methods and Procedures

Neither mediation nor arbitration will be acceptable as a means for settling claims, disputes, or other matters. Claims and disputes between the **OWNER** and the **CONTRACTOR**, which cannot be resolved to the satisfaction of both parties, shall be filed in the Circuit Court, Marion County, Florida.

SC-17 MISCELLANEOUS

SC-17.04 Survival of Obligations

Add the following new paragraph immediately after Paragraph 17.04A of the General Conditions:

- C. **CONTRACTOR** shall obtain from all suppliers and manufacturers any and all warranties and guarantees of such suppliers and manufacturers, whether or not specifically required by the specifications, and shall assign such warranties and guarantees to the **OWNER**. With respect thereto, the **CONTRACTOR** shall render reasonable assistance to the **OWNER** when requested, in order to enable the **OWNER** to enforce such warranties and guarantees. The assignment of any warranties or guarantees shall not affect the correction period or any other provisions of these Contract Documents.

Add the following ARTICLE 18 to Volume I, City of Ocala, General Conditions for Construction.

SC-18 OWNER PROCURED MATERIALS, SUPPLIES AND EQUIPMENT

SC-18.01 General

- A. The **OWNER**, in order to utilize and comply with Section 212.08(6), Florida Statutes, reserves the right to require the **CONTRACTOR**, and the **CONTRACTOR** agrees to be bound and subject to such reservation, to assign some or all of its subcontracts or other **AGREEMENTS** with material suppliers regarding the sale and delivery of project construction materials directly to the **OWNER**. The responsibilities of both the **OWNER** and the **CONTRACTOR** relating to the **Owner Procured Materials** shall be governed by the terms and conditions of this section, which shall take precedence over other provisions and terms of the Contract Documents where inconsistencies or conflicts exist. This section will be interpreted so as to provide the **OWNER** the exemption from sales tax set forth in Section 212.08(6), Florida Statutes, as amended from time to time.
- B. For purposes of the Contract Documents, the “**Owner Procured Materials**” means those items of material, supplies, and/or equipment purchased directly from the material supplier/vendor by the **OWNER** for inclusion in the project.

- C. The **Owner Procured Materials** shall be exempt from the competitive bid process as the cost of such materials has been incorporated in the bid of the successful project **BIDDER** as part of the competitively bid project process.
- D. The transfer of possession of the **Owner Procured Materials** from the **OWNER** to the **CONTRACTOR** during the work shall be a bailment for the mutual benefit of the **OWNER** and the **CONTRACTOR**. The **OWNER** shall be the bailor and the **CONTRACTOR** the bailee of the **Owner Procured Materials**. Possession of the **OWNER Procured Materials** shall be returned to the **OWNER** for purposes of such bailment at such time as they are incorporated into the project or consumed in the process of completing the project. At all times, legal and equitable title of the **Owner Procured Materials** shall remain in the **OWNER**.

SC-18.02 Owner Responsibilities – The **OWNER** shall:

- A. Request from the **CONTRACTOR** copies of its supplier's bid documents on certain materials that the **OWNER** wishes to procure directly from the **CONTRACTOR'S** supplier.
- B. Issue an **OWNER'S** Purchase Order to each supplier for each item the **OWNER** wishes to procure directly from said supplier. Said Purchase Order shall include the **OWNER'S** tax exemption number and be accompanied by a copy of the **OWNER'S** Certificate of Exemption.
- C. Implement its standard purchasing procedure for the purchase of the **Owner Procured Materials** in accordance with the terms of the **OWNER'S** Purchase Order and the **OWNER'S** purchasing procedures. The **ENGINEER** shall be the approving authority for the **OWNER'S** Purchase Orders issued in conjunction with **Owner Procured Materials**.
- D. Sign and acknowledge, acting through designated **OWNER'S** representative, all delivery tickets and invoices, which should be ticketed and invoiced in the **OWNER'S** name only, evidencing the transfer of title to the **OWNER** while accepting delivery from the material supplier for the **Owner Procured Materials**.
- E. Visually inspect shipment to initially verify that the **Owner Procured Materials** conform to the specifications. If the **OWNER** delegates this duty to an authorized representative and the **OWNER'S** appointed representative discovers defective or non-conformities in the **Owner Procured Materials** upon such visual inspection, the **OWNER** shall notify the **CONTRACTOR** and the **CONTRACTOR** shall not utilize such non-conforming or defective materials in the project and instead shall promptly notify the appropriate supplier of the defective or non-conforming condition so that repair or replacement of those materials can occur without any undue delay or interruption to the project.

- F. Directly pay the purchase price to the supplier of the **Owner Procured Materials** in accordance with the **OWNER'S** Purchase Order, supplier's invoice, and standard **OWNER'S** payment procedures. The **CONTRACTOR** shall not be liable for any portion of the purchase price of the **Owner Procured Materials**.
- G. Bear the risk of loss, and purchase and maintain insurance sufficient to protect against any loss of or damage to the **Owner Procured Materials**. Such insurance shall cover the full value of any of the **OWNER Procured Materials** not yet incorporated into the project during the period between the time the **OWNER** first takes title to any such **Owner Procured Materials** and the time when the last of such **Owner Procured Materials** is incorporated into the project or consumed in the process of completing the project.
- H. Notwithstanding the transfer of the **Owner Procured Materials** by the **OWNER** to the **CONTRACTOR'S** possession, the **OWNER** shall, at all times, retain legal and equitable title to any and all the **Owner Procured Materials**.

SC-18.03 Contractor Responsibilities – **CONTRACTOR** shall:

- A. Include the price for all construction materials, including the **Owner Procured Materials**, in their bid.
- B. For those items exceeding \$5,000, or specified by the **OWNER**, provide the **OWNER** with a list of intended suppliers, vendors, and materials for review by the **OWNER**.
- C. Submit quotes from such suppliers, as well as a reasonably detailed description of the materials to be supplied, including estimated quantities and prices.
- D. Upon written request by the **OWNER**, submit a deductive change order to the **OWNER** in accordance with Section 12 of the General Conditions for the items specified by the **OWNER** as the **Owner Procured Materials**. The change order shall deduct the total cost of all the **Owner Procured Materials** to be provided to the **OWNER** by each supplier from whom the **OWNER** elects to purchase material directly, plus all sales taxes associated with such materials, from the **CONTRACTOR'S** accepted bid. The **OWNER'S ENGINEER** shall recommend to the **OWNER** the approval of such deductive change orders in conjunction with the **Owner Procured Materials**.
- E. Propose and coordinate, subject to the **OWNER** approval, delivery schedules, sequence of delivery, loading orientation, and other arrangements normally provided by the **CONTRACTOR** for the **Owner Procured Materials** furnished to the project job site. The **CONTRACTOR** shall provide all services required for the unloading, handling and storage of the **Owner Procured Materials** through installation. The delivery schedule shall be

coordinated in a manner to assure timely delivery of the **Owner Procured Materials** from the supplier. It is the ultimate responsibility of the **CONTRACTOR** to insure that the **OWNER** is timely notified and requested to submit purchase orders for the **Owner Procured Materials** so that the timely delivery of the **Owner Procured Materials** is accomplished in a manner that prevents any delay in construction. The **CONTRACTOR** shall not be entitled to any extension of the contractually required substantial completion date as a result of the untimely delivery of the **Owner Procured Materials**.

- F. Insure, on behalf of the **OWNER** that the **Owner Procured Materials** conform to the specifications and shop drawings, and determine prior to incorporation into the project if such materials are non-conforming or defective, and whether such materials are identical to the materials ordered and match the description on the bill of lading. If the **CONTRACTOR** discovers defective or non-conformance in the **Owner Procured Materials** upon such inspection, then the **CONTRACTOR** shall not utilize such non-conforming or defective materials in the project and instead shall promptly notify the **OWNER** of the defective or non-conforming conditions so that repair or replacement of those materials may occur without any undue delay or interruption to the project. If the **CONTRACTOR** fails to perform such inspection and otherwise incorporates into the project such defective or non-conforming the **Owner Procured Materials**, the condition of which it either knew or should have known by performance of the inspection required by this paragraph, then the **CONTRACTOR** shall be responsible for all damages to the **OWNER** resulting from the **CONTRACTOR'S** incorporation of such materials into the project including liquidated or delay damages.
- G. Provide all warranties and guarantees for installed **Owner Procured Materials** required by the Contract Documents. All repair, maintenance or damage-repair calls shall be forwarded to the **CONTRACTOR** who shall act as the **OWNER** representative for resolution with the appropriate supplier, vendor, or subcontractor.
- H. Protect against loss of or damage to the **Owner Procured Materials**.
- I. Make all shop drawings and submittals regarding the **Owner Procured Materials** in accordance with Section 6.17 - Contractor Responsibilities of the General Conditions.
- J. Maintain records of all the **Owner Procured Materials** it incorporates into the project. The **CONTRACTOR** shall account monthly to the **OWNER** for all the **Owner Procured Materials** delivered into the **CONTRACTOR'S** possession, indicating portions of all such materials that have been incorporated into the project or consumed during the work.
- K. Indemnify the **OWNER** and hold it harmless from any and all claims of whatever nature resulting from damage to the **Owner Procured Materials** arising from the actions of the **CONTRACTOR**.

SC-19 ABBREVIATIONS OF TERMS AND ORGANIZATIONS

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies
AFBMA	Antifriction Bearing Manufacturers Association
AFPA	American Forest & Paper Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHA	American Hardboard Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
AREMA	American Railway Engineers and Maintenance-of-Way Association
ARI	American Refrigeration Institute
ASAHC	American Society of Architectural Hardware Consultants
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
ATMS	Advanced Traffic Management Systems
AVATI	See RTI
AWG	American Wire Gauge
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWPB	American Wood Preservers Bureau
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of American (formerly SCPI)
CCTV	Closed Circuit Television
CDA	Copper Development Association
CISPI	Cast Iron Soil Pipe Institute
CMAA	Crane Manufacturers Association of America
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute

CS	Commercial Standard (U. S. Department of Commerce)
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EEl	Edison Electric Institute
EJCDC	Engineers' Joint Contract Documents Committee
EPA	Environmental Protection Agency
Fed Spec	Federal Specification
FCI	Fluid Controls Institute
F.D.O.T.	Florida Department of Transportation
FGMA	Flat Glass Marketing Association
FHWA	Federal Highway Administration
FIA	Factory Insurance Association
FM	Factory Mutual
FSA	Fluid Sealing Association
FTI	Facing Tile Institute
HEI	Heat Exchange Institute
HMI	Hoist Manufacturers Institute
HPMA	Hardwood Plywood Manufacturers Association
HTI	Hand Tools Institute
I-B-R	Institute of Boiler and Radiator Manufacturers
IEEE	Institute of Electrical and Electronics Engineers
IBC	International Building Code
IES	Illuminating Engineering Society
IFI	Industrial Fasteners Institute
IMSA	International Municipal Signal Association
IPCEA	Insulated Power Cable Engineers Association
IRI	Industrial Risk Insurers
ISA	Instrument Society of America
ITS	Intelligent Transportation System
MHI	Materials Handling Institute
MIL	Military Specification
MMA	Monorail Manufacturers Association
MSS	Manufacturers Standardization Society of Valve and Fitting Industry
NAAMM	National Association of Architectural Metals Manufacturers
NACE	NACE International
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors
NBHA	National Builders Hardware Association
NBS	National Bureau of Standards
NCSPA	National Corrugated Steel Pipe Association
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NEMI	National Elevator Manufacturing Industry
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology (formerly NBS)

NLA	National Lime Association
NPC	National Plumbing Code
NPT	National Pipe Thread
NRMCA	National Ready Mixed Concrete Association
MSC	National Safety Council
NSF	National Sanitation Foundation
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PS	Product Standard
RIS	Redwood Inspection Service
RTI	Resilient Tile Institute (formerly AVATI)
SAE	Society of Automotive Engineers
SCPRF	Structural Clay Products Research Foundation
SDI	Steel Door Institute
SFPA	Southern Forest Products Association
SI	Système International des Unités (International System of Units)
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPFA	Steel Plate Fabricators Association
SPI	Society of the Plastics Industry
SPTA	Southern Pressure Treaters Association
SSI	Scaffolding and Shoring Institute
SSPC	Steel Structures painting Council
UL	Underwriters' Laboratories
USBR	U. S. Bureau of Reclamation
WEF	Water Environment Federation

APPLICATION FOR PAYMENT

APPLICATION NUMBER _____ CONTRACTOR _____

PROJECT _____ APPLICATION DATE _____

Analysis of Work Performed BID# _____ PERIOD ENDING _____

- | | |
|---|----------------------------|
| 1. Original Contract Price | _____ |
| 2. Net Increase/Decrease to date due to Change Orders | _____ |
| 3. Total contract price to date | _____ |
| 4. Value of contract performed to date | _____ |
| 5. Less _____ % Retainage | _____ |
| 6. Subtotal | _____ |
| 7. Stored Materials _____ | _____ |
| 8. Less _____ % Retainage _____ | NET STORED MATERIALS _____ |
| 9. Total value of work performed to date | _____ |
| 10. Less amount of previous payments | _____ |
| 11. Balance due this estimate | _____ |
| 12. Balance left from contract price to completion
(subtract [4+7] from 3) | _____ |

Contractor's Certification

The undersigned **CONTRACTOR** hereby swears under penalty of perjury that 1.) all previous progress payments received from the **OWNER** on account of work performed under the contract referred to above have been applied by the undersigned to discharge in full all obligations of the undersigned incurred in connection with work covered by prior Applications for Payment under said contract, being Applications for Payment numbered 1 through ____ inclusive; and 2.) all materials and equipment incorporated in said project or otherwise listed in or covered by this Application for Payment are free and clear of all liens, claims, security interests and encumbrances.

_____	_____	By _____
Dated	Contractor	(Name and Title)

_____	_____
Project Engineer	Project Inspector

_____	_____
ENGINEER	City Manager

CHANGE ORDER

No. _____

DATE OF ISSUANCE _____ EFFECTIVE DATE _____

OWNER _____
 CONTRACTOR _____
 Contract: _____
 Project: _____
 OWNER'S Contract No. _____ ENGINEER'S Contract No. _____
 ENGINEER _____

You are directed to make the following changes in the Contract Documents:

Description

Reason for Change Order:

Attachments: (List documents supporting change)

CHANGE IN CONTRACT PRICE:
Original Contract Price \$ _____
Net Increase (Decrease) from previous Change Orders No. _____ to _____: \$ _____
Contract Price prior to this Change Order: \$ _____
Net Increase (Decrease) of this Change Order: \$ _____
Contract Price with all approved Change Orders: \$ _____

CHANGE IN CONTRACT ITEMS:
Original Contract Times: Substantial Completion: _____ Ready for final payment: _____ (days or dates)
Net Change from previous Change Orders No. _____ to No. _____: Substantial Completion: _____ Ready for final payment: _____ (days)
Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____ (days or dates)
Net Increase (Decrease) this Change Order: Substantial Completion: _____ Ready for final payment: _____ (days)
Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____ (days or dates)

RECOMMENDED:

APPROVED:

ACCEPTED:

By: _____
ENGINEER (Authorized Signature)By: _____
OWNER (Authorized Signature)By: _____
CONTRACTOR (Authorized Signature)

Date: _____

Date: _____

Date: _____

EJCDC 1910-8-B (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

WORK CHANGE DIRECTIVE

No. _____

DATE OF ISSUANCE: _____

EFFECTIVE DATE: _____

OWNER _____

CONTRACTOR _____

Contract: _____

Project: _____

OWNER'S Contract No.: _____ ENGINEER'S Project No.: _____

You are directed to proceed promptly with the following change(s):

Description:

Purpose of Work Change Directive:

Attachments: (List documents supporting change)

If **OWNER** or **CONTRACTOR** believe that the above change has affected Contract Price any Claim for a Change Order based thereon will involve one or more of the following methods as defined in the Contract Documents.

Method of determining change in Contract Price

- ☐ Unit Prices
☐ Lump Sum
☐ Cost of the Work _____

Estimated Increase (decrease) in Contract Price:

\$ _____

Estimated Increase (decrease) in Contract Times:

Substantial Completion: _____ days

Ready for final payment: _____ days

If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

RECOMMENDED:

AUTHORIZED:

ENGINEER_____
OWNER

BY: _____

BY: _____

EJCDC No. 1910-8-F (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

PROJECT REQUIREMENTS

GENERAL DESCRIPTION OF WORK

The scope of this project consist of construction of an Advanced Traffic Management System (CCTV Cameras, Traffic Monitoring Count Stations, and Highway Signage) enabling the Ocala Traffic Management Center to collect real time field data and remote operation of equipment.

1.01 Inspection and Acceptance

The **CITY** shall inspect all work upon completion of the work and formally accept the work. It shall be the **CONTRACTOR'S** responsibility to schedule and hold preliminary and final acceptance meetings. Failure of the **CITY** staff to detect discrepancies and poor workmanship and material shall not relieve the **CONTRACTOR** of the responsibility for completion of the task and successful operation as required. The **CONTRACTOR** shall warrant all work for a period of twelve (12) months for workmanship and for a period equal to the manufacturer's warranty period for material.

2.01 Required Specifications and Standards

All work and material shall be in accordance with the latest applicable Florida Department of Transportation (F.D.O.T.) specifications as required by the pay item designation, latest Roadway and Traffic Design Standards and as modified by the City of Ocala Traffic Standards. Please refer to F.D.O.T. Basis of Estimates Manual for additional item descriptions.

3.01 Project Billing

For projects with a performance period equal to or less than 60 days, the **CONTRACTOR** shall issue only one (1) invoice to the **CITY** for the total project amount. This invoice shall be issued at the project's completion and following acceptance of the work by the **CITY**. For projects with a performance period greater than 60 days, the **CONTRACTOR** shall issue only one (1) invoice to the **CITY** for that work completed within the first 35 days and many subsequently issue monthly invoices until the project's completion. The final invoice shall be issued at the project's completion and following acceptance of the work by the **CITY**.

4.01 Project Management

The **CONTRACTOR** shall identify a project manager (both prime and sub-contractor when applicable) for the project and provide emergency and non-emergency telephone numbers (office, home, pager, and cellular) to the **CITY** at the award of the contract. The project manager shall remain with the project for the life of the contract unless a change is requested in writing by the **CONTRACTOR** and approved by the **ENGINEER**.

5.01 Work Schedules and Maintenance of Traffic

The **CONTRACTOR** shall schedule work to minimize impact on the peak traffic periods. Peak periods are defined as 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Monday through Friday. No lane closures shall be permitted during the peak periods. Work performed in Florida Department of Transportation (F.D.O.T.) right of way must comply with local F.D.O.T. work time constraints.

The **CONTRACTOR** shall provide Certified Personnel for maintenance of traffic in accordance with the latest F.D.O.T. Design Standards 600 Series for the project. Failure to comply with this requirement will result in complete shutdown by the **ENGINEER** with no additional compensation to the **CONTRACTOR**.

6.01 Mobilization

Compensation for Mobilization shall be payment for this pay item at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. Mobilization costs will be paid when all equipment has been mobilized per Florida Department of Transportation (F.D.O.T.) Standard Specifications for Road and Bridge Construction Latest Edition, Section 101.

7.01 Contractor Selection Criteria

The **CONTRACTORS** must provide unit prices for each item. Bid tabulation sheets with missing unit prices will be disqualified.

It shall be mandatory for the interested **CONTRACTORS** to disclose and provide the information listed below. Failure to provide the requested information shall disqualify the firm from the process.

1. Disqualification or removal by F.D.O.T. or any other government agency or private entity for non-performance at any time for the past five (5) years. Provide dates, type of work, agency project manager, telephone number, amount of contract.
2. Provide three (3) client references. Provide name, address, contact person, telephone number, fax number, project name, and contract amount. This requires completion of Form 418 contained in the Bid Forms section of these specifications.
3. Provide proof of experience for at least two (2) years. This requires completion of Form 415 contained in the Bid Forms section of these specifications.

8.01 Construction/Reconstruction of Roadway

Any construction and/or reconstruction of roadway and subsequent testing shall be in accordance with the applicable sections of the F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition.

9.01 Density and Concrete Testing

The **CITY** will secure an independent testing company to perform all tests required by the Standard General Conditions, Section 13 in Volume I, General Conditions for Construction. The **CITY** will pay for all regular testing as required. The **CONTRACTOR** will pay for all failed tests re-tested.

A. Density and Concrete Testing Procedure

The project representative for the **CITY** will have the responsibility of contacting the testing company when tests are required.

The **CONTRACTOR** shall be responsible for scheduling all testing with the project representative. The **CONTRACTOR** shall be responsible for scheduling all work in such a manner as to allow for proper testing as specified by these and the F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition.

Results of all tests shall be delivered by the testing company to the **ENGINEER** who in turn will supply a copy each to the **CONTRACTOR** and the project representative.

Asphalt samples will only be taken at the job site and will have to meet these specifications. The **CITY** will not test at the asphalt plant.

All work which has not been tested and accepted shall not be paid for.

If the **CONTRACTOR** requests the inspector to order tests made, and because of the **CONTRACTOR** not being ready for the test, standby time is charged by the testing company, the **CONTRACTOR** shall be back-charged for such charges.

10.01 Operational Readiness Testing

Prior to start-up, the entire installed system and components shall be inspected, tested, and documented that they are ready for operation

11.01 Start-up Testing

Prior to the issuance of the Certificate of Substantial Completion, the **CONTRACTOR** must complete start-up testing in the presence of the **ENGINEER** or Resident Project Representative. The **CONTRACTOR** must provide all personnel and equipment necessary to complete the start-up tasks. The **ENGINEER** will direct the **CONTRACTOR** relative to the required operation and performance under the different operating conditions.

The start-up testing will be conducted for seven (7) consecutive days. The system must operate successfully during the seven (7) day testing period in the manner intended. If the work does not operate successfully, the problems will be corrected and the test will start over from day one (1).

The **ENGINEER** decision shall be final regarding the acceptability of all testing. The Certificate of Substantial Completion will not be issued until the final acceptance of all testing by the **ENGINEER**

12.01 Manufacturer's Services

The **CONTRACTOR** shall furnish manufacturer's representative as required to resolve assembly or installation problems with their products and systems.

The **CONTRACTOR** shall conduct, with the assistance of the manufacturers/supplier's representative, start-up and operational tests on the equipment and system. The **CONTRACTOR** shall submit prior to the issue of the Certificate of Substantial Completion, a certificate of proper installation by the manufacturer certifying that the system has been properly installed according to the Contract Documents and manufacturer's recommendations.

MEASUREMENT AND PAYMENT

1. SCOPE. This section covers methods of measurement and payment for items of Work under this Contract. This section is to be utilized in conjunction with the City of Ocala, Volume III, Standard Specifications, latest edition, the F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition, and the F.D.O.T. Roadway Design Standards, latest edition. In the case of discrepancy the most stringent description shall govern.
2. GENERAL. The Contract Price shall cover all Work required by the Contract Documents. All costs in connection with the proper and successful completion of the Work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction, equipment, and tools; and performing all necessary labor and supervision to fully complete the Work, shall be included in the unit and lump sum prices bid. All Work not specifically set forth as a pay item in the Bid Form shall be considered a subsidiary obligation of **CONTRACTOR** and all costs in connection therewith shall be included in the prices bid.
3. ESTIMATED QUANTITIES. All estimated quantities stipulated in the Bid Form or other Contract Documents are approximate and are to be used only as: (a) a basis for estimating the probable cost of the Work, and; (b) for the purpose of comparing the Bids submitted for the Work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for work and materials will be the actual amount of work done and materials furnished. **CONTRACTOR** agrees that it will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts therefor.
4. DESCRIPTION FOR BID ITEMS. The following list of pay items with descriptive specifications available in the Specification Package Appendix includes pay item numbers and the detailed measurement of payment relating to those items as identified by Bid Item Number and shall constitute full compensation as required by the **CITY** and F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition.

Payment for these bid items shall be made at the contract price bid per lump sum and shall constitute full compensation for mobilizing the **CONTRACTOR'S** equipment labor field office material storage site and all other appurtenant work necessary for the **CONTRACTOR** to begin and perform work until completion and shall be made at the unit price set forth in the proposal and shall constitute full compensation as required by the **CITY** and by F.D.O.T.

Design Standards for Design, Construction and Maintenance and Utility Operations on Streets and Highways, latest edition. This work shall be per Section 101 – Mobilization” in the F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition. Payment will be made at 50% of bid price per month for first two (2) months.

101-01 MOBILIZATION..... LS

This work shall be in accordance with Section 102 – “Maintenance of Traffic” in the F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition.

102-01 MAINTENANCE OF TRAFFIC..... LS

Payment for this bid item shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents.

102-14 TRAFFIC CONTROL OFFICER..... MH

Payment for these bid items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents, and shall include, but not be limited to, all labor, trenching, backfilling, and restoration materials necessary for a complete and accepted installation. Payment for conduit placed in the ground will be based on the horizontal path of the installed conduit as measured in a straight line between the centers of pull boxes, cabinets, poles, etc. No allowance will be made for sweeps or vertical distances above or below the ground. Furnishing and installing locate wire is included in the cost of the conduit.

555-1-1 2-2” HDPE CONDUIT (DIRECTIONAL BORE) F&I..... LF

555-1-2 3-2” HDPE CONDUIT (DIRECTIONAL BORE) F&I..... LF

630-1-12 CONDUIT UNDERGROUND (2” PVC) F&I..... LF

783-4-111 ITS CONDUIT, F&I..... LF

783-4-112 ITS CONDUIT (2” DIA. P.V.C. UNDERGROUND), F&I..... LF

Payment for these bid items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. The contract price per linear foot or assembly for cable / wire, furnished and installed, will include furnishing all material, hardware, support wire, cable ties, cable clamps, lashing wire, terminal connectors, grounding and labor necessary for a complete and accepted installation.

639-2-1 POWER SERVICE WIRE..... LF

783-8-1 6 WIRE/18GAUGE SHIELDED CABLE WITH (1) CAT 5e..... LF

639-1-22 ELECTRICAL POWER..... AS

780-1-11 ITS ELECTRICAL POWER (SOLAR) F&I..... AS

Payment for these bid items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents. All pull boxes are to be concrete with a non-conductive lid (quasite type or approved equivalent), located a minimum of five (5) feet from radius and ten (10) feet from edge of pavement. Lids shall be marked "Traffic Signal".

635-1-11	PULL BOX F&I.....	EA
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783-7-1	ITS PULL AND JUNCTION BOX, F&I.....	EA
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Payment for these bid items shall be made at the unit price set forth in the bid schedule and shall constitute full compensation for work specified in the contract documents (specifications package (appendix) and supplementary technical specifications). Payment shall include all mounting hardware, materials and equipment, labor, and miscellaneous materials necessary for a complete and accepted installation.

785-1-13	ITS POLE, CONCRETE WITHOUT LOWERING DEVICE, F&I.....	EA
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641-2-12	PRESTRESSED CONCRETE POLE TYPE P-11(12') F&I.....	EA
----------	---	----

746-71-131	TMS, TYPE III CABINET, F&I.....	EA
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785-2-111	ITS POLE MOUNTED CABINET, F&I.....	EA
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668-13	CABINET (F.D.O.T. TYPE III (INDEX 17900) – 32”X20”X14”) F&I.....	EA
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690-50	EXSISTING CABINET REMOVAL.....	EA
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700-20-11	SINGLE POST TRAFFIC SIGN (I-75 ROUTE SIGNS) F&I.....	AS
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700-20-19	SINGLE POST WITH SCROLLING MYLAR SIGN (SPECIAL) F&I.....	AS
-----------	--	----

700-48-19	TRAFFIC SIGN F&I (“WHEN FLASHING”) SIGN ONLY.....	EA
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700-90-11	SOLAR FLASHING BEACON CONTROLLER ASSEMBLY F&I.....	AS
-----------	--	----

741-70-111	TMS, VEHICLE SENSOR, CLASS II, TYPE I, ½ LANE (6 FT.), F&I.....	EA
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743-70-11	TMS, VEHICLE SPEED/CLASS, UNIT, F&I.....	AS
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745-70-12	TMS, INDUCTIVE LOOP ASSEMBLE (TWO LOOPS/LANE) F&I.....	AS
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782-1-11	ITS CCTV CAMERA (DOME ENCLOSED-PRESSURIZED), F&I.....	EA
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784-6-11	ITS RADIO COMMUNICATIONS (MASTER LOCATION), F&I.....	EA
----------	--	----

784-6-13	ITS RADIO COMMUNICATIONS (REMOTE LOCATION), F&I.....	EA
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SUBMITTALS

1.01 General

Provide submittals as required by City of Ocala, Volume I, General Conditions for Construction.

Shop Drawings

- A. The **CONTRACTOR** is required to submit, to the **ENGINEER**, a complete listing of all materials that are required by the Contract Documents. An itemized list of shop drawings shall be submitted using form WSCM001. A sample form is attached to the end of this section. The objective of this form is for the **CONTRACTOR** to identify which of the approved materials listed on the pertinent material specification sheets they are requesting be installed. Actual copies or multi copies of shop drawings shall not be required except for equal or substitute items that vary in size or configuration or where specifically required by the **ENGINEER**. Additional copies of form WSCM001 can be obtained from the **ENGINEER**. Individual forms shall be used to submit shop drawings.
- B. No shop drawing shall be accepted without a standard submittal form (WSCM001). Form WSCM001 shall be filled in completely and shall contain the **CONTRACTOR'S** name and address, project name, project number (where applicable) and the appropriate box, either shop drawing or sample, filled in identifying the type of submittal. Shop drawing submittals for each section of the work shall be numbered consecutively and the numbering system shall be maintained throughout all revisions. Each item or shop drawing shall be numbered consecutively and shall be preceded with the shop drawing submittal number. For example, the third item or shop drawing of the first submittal shall be numbered 1.3. Revised shop drawing submittals shall utilize a third number indicating that it is a revised shop drawing and further indicating the number of times it has been submitted such as 1.3.2, which would mean the second submittal of shop drawing number 1.3. The first submittal would be 1.3.1 but for simplicity, the one has been dropped and is not required.

<u>Submittal Sheet No.</u>	<u>Item No. On Sheet</u>	<u>No. Times Submitted</u>
1.	3.	2.

- C. Actual shop drawings, where required, shall be complete in every detail, properly identified with the specification number for identification of each item and stating qualifications, departures or deviations from the Contract Documents, if any. Each drawing shall have a clear space for the approval stamps of the **CONTRACTOR** and the **ENGINEER**. The **CONTRACTOR** shall submit, when required, five (5) sets of pertinent documents.

- D. The **ENGINEER** approval of shop drawings shall not relieve the **CONTRACTOR** of responsibility for any deviations from the requirements of the Contract Documents unless the **CONTRACTOR** has, in writing, called the **ENGINEER'S** attention to such deviation at the time of submission and the **ENGINEER** has given written approval to the specific deviation. All shop drawings shall be thoroughly checked by the **CONTRACTOR** for compliance with the F.D.O.T. Approved Product List. The **CONTRACTOR** shall signify that they have checked the items being submitted by signing and dating the submittal form. After submission and approval of the shop drawings, the **CONTRACTOR** shall submit, if required, bound copies of detailed instructions covering the operation and maintenance of all equipment furnished under the contract.
- E. Each subcontractor shall submit all shop drawings through the prime **CONTRACTOR** for the **ENGINEER'S** approval. Submittals will not be accepted from subcontractors or suppliers (except in special instances when specifically authorized by the **ENGINEER**).
- F. The **CONTRACTOR** shall submit shop drawings promptly. No extension of time will be granted to the **CONTRACTOR** because of failure to have shop drawings submitted in ample time to allow for checking, subsequent submittals and reviews, and approval.
- G. The **CONTRACTOR** shall also submit to the **ENGINEER** for approval with such promptness as to cause no delay in work, all samples required by the Contract Documents. All samples will have been checked by and stamped with the approval of the **CONTRACTOR**, identified clearly as to material, manufacturer, any pertinent catalog numbers and the use for which intended.
- H. The **ENGINEER** shall promptly review the items being submitted. The **ENGINEER'S** review shall be only to ensure that the materials and samples specified for the project in the Contract Documents are provided and documented. The **ENGINEER** shall return to the **CONTRACTOR** a complete list of all the shop drawings or samples submitted and shall indicate whether the item has been approved or not. Items not being approved shall be resubmitted as specified in Paragraph 1.4.2.2.
- I. Drawings

Submit a minimum of four (4) copies of shop drawings that illustrate the material or equipment to be provided, to the **ENGINEER** for review and approval using Form WSCM001 as attached.

Shop Drawings should include, as applicable, the following:

- a. System or equipment drawings, including dimensions, size and location.
- b. Catalog information and cuts applicable to the work.
- c. Installation or placing drawings.
- d. Complete manufacturer's specifications.

- e. Performance data.
- f. Suggested spare parts list with current price information.
- g. List of material and supplies furnished with the equipment.
- h. Special handling instructions.
- i. Requirements for storage and protection prior to installation.
- j. List of all requested exceptions to Contract Documents.
- k. Requirements for routine maintenance required prior to start-up.
- l. Wiring and control diagrams of systems and equipment.
- m. Motor manufacturer's descriptive literature.
- n. List of special features being provided.

Combine submittals specified in each section into a single package and sequentially number the transmittal forms. Identify project, **CONTRACTOR**, and the system or equipment identification tag on the transmittal form. Apply the **CONTRACTOR'S** stamp, signed or initialed, certifying submittal meets requirements.

When shop drawings have been reviewed, copies will be returned to the **CONTRACTOR** appropriately marked. If major changes or corrections are required, the shop drawings will be returned with such changes or corrections indicated. The **ENGINEER** will keep two (2) copies for his use.

J. Operation and Maintenance Manuals

Submit a minimum of five (5) copies of complete instruction manuals for installation, operation, and maintenance requirements for each unit or equipment supplied. O & M Manuals should include, as applicable, the following:

- a. Diagrams and illustrations.
- b. Detailed descriptions of each main component of the system.
- c. Performance and Nameplate data.
- d. Installation instructions.
- e. Procedure for starting.
- f. Proper adjustment.
- g. Procedure for operating.
- h. Shutdown procedures.
- i. Troubleshooting guide.
- j. Safety precautions.
- k. Electrical interconnection wiring diagrams.
- l. Results of field functional and performance tests.
- m. Maintenance summary form indicating maintenance requirements.
- n. Information on coatings and final finishes.

CONSTRUCTION SURVEY LAYOUT

1.01 General

The work to be performed shall be for the survey work necessary to establish proper alignments, right of way, easements, bench marks, elevations and grade stakes to complete all phases of this contract.

2.01 General Requirements

All original field notes, calculations, and other documents developed by the surveyor in conjunction with this work shall be given to the **CITY** and become **CITY** property.

The above work shall be done in such sequence that the above items will be in place at final acceptance of the project. All surveying work must be in accordance with Chapters 177 and 472 of Florida Statutes and Chapter 61G17 of the Florida Administrative Code.

CONSTRUCTION FACILITIES

1.01 Administrative Submittals

Submit copies of permits and approvals for construction as required by laws and regulations and governing agencies.

2.01 Final Cleaning

At completion of work, clean entire work and project site as applicable.

- a. Leave the work and adjacent areas affected in a cleaned condition satisfactory to the **CITY**.
- b. Remove grease, dirt, dust, paint, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
- c. Broom clean exterior paved driveways and parking areas.
- d. Hose clean sidewalks and concrete exposed surfaces.

Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

Submit temporary construction parking area plans, storage yard, storage trailer location, staging area plan, and plan for disposal of waste materials.

3.02 Mobilization

Obtaining of required permits and the moving of **CONTRACTOR'S** operations and equipment required for construction.

Provide on-site construction power and wiring, and on-site communication facilities as needed.

Provide on-site sanitary facilities and potable water facilities as required. The **CONTRACTOR** will not be permitted to use **CITY** sanitary facilities during construction.

Posting of OSHA required notices and establishing of safety programs and procedures.

4.01 Erosion, Sediment, and Flood Control

Provide, maintain, and operate temporary facilities to control erosion and sediment, and to protect work and existing facilities from flooding during construction.

Maintain drainage ways and construct temporary drainage facilities to allow runoff to flow properly.

ASBUILT SURVEY

1.01 Scope

The **CONTRACTOR** shall be responsible for providing detailed asbuilt construction information for all Intelligent Transportation System equipment constructed under this contract. The services of a Professional Engineer licensed to practice in the State of Florida or IMSA Certified Level III Technician may be used by the **CONTRACTOR** for this work.

2.01 Original Drawings

The **ENGINEER** shall supply reproducible drawings of the construction plans to the **CONTRACTOR** on which they shall show any deviations or additions from the original plans for the specified asbuilt items.

3.01 Original Submittal

Two (2) copies of all required asbuilts shall be submitted to the **ENGINEER**. No originals or certified copies shall be accepted at this time. A cover letter shall accompany the submittal.

4.01 Review

Asbuilts submitted shall be reviewed for content and compliance to asbuilt requirements. Allow ten (10) working days for review. If the asbuilts are incomplete, one (1) set of submitted data shall be returned with comments marked in red. The submittee shall correct the asbuilts as indicated on the red lines. Resubmit as described below. If the information is correct, the submitter will be notified and all final asbuilts shall then be delivered to the **ENGINEER** as described below.

5.01 Resubmittal

After all corrections, additions, or deletions have been made the asbuilts shall then be resubmitted. Two (2) sets of those items that were returned for corrections along with the red lines shall be resubmitted. No originals or certified copies shall be accepted at this time. Resubmittals without the red lines will not be accepted. Review shall be as stated above.

6.01 Final Submittal

After the asbuilts have been reviewed and comply with all asbuilt requirements the **ENGINEER** shall notify the subcommittee by telephone to submit final data. Final asbuilts shall include one (1) copy of the asbuilts signed, dated, and sealed by a Professional Engineer, licensed in the State of Florida. The reproducible plans furnished by the **ENGINEER** shall be returned showing the approved asbuilt information along with approved reproducible originals.

7.01 Finish Grading and Grass

CONTRACTOR shall furnish all material, labor, equipment, and supervision required to grade and sod all areas constructed, disturbed, or damaged by their operations.

a. Finish Grading

As soon as practical after completion of backfilling, the **CONTRACTOR** shall grade all areas on the site to be grassed, as indicated on drawings, or disturbed by the construction operations and acceptable to the **ENGINEER**.

b. Grassing

The **CONTRACTOR** shall sod all disturbed areas affected by their work as directed by the **ENGINEER**.

It is the intent of this specification that the **CONTRACTOR** shall produce a satisfactory stand of grass, free of weeds and foreign growth, before final payment. If it is necessary to repeat any or all of the work, including plowing, fertilizing, watering, and sodding, the **CONTRACTOR** shall nevertheless repeat these operations without additional compensation until a satisfactory stand is obtained.

The **CONTRACTOR** shall be responsible to see that planted areas receive sufficient water until full coverage is obtained.

All planting, fertilizing and preparations for providing a healthy stand of grass shall be done in accordance with instructions from the local agricultural agent and Section 575 of F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition.

8.01 Earthwork

a. General

Provide labor and materials necessary to complete clearing, grubbing, preparation of site, removal and disposal of all debris and unsuitable material, excavation, trenching, backfill, preparation of subgrades, protection of adjacent property, grading, and other work required to complete the earthwork indicated on the plans.

b. Surface Preparation

All areas to be occupied by permanent construction or fill areas shall be cleared of all trees, roots, brush, and other objectionable materials and debris. All stumps shall be grubbed. Subgrades shall be cleaned and stripped of all surface vegetation, sod, or organic topsoil. All waste materials shall be properly disposed of by the **CONTRACTOR**.

c. Excavation

Excavation shall provide adequate working space and clearances for the work to be performed. Excavation and trenching shall include the removal and handling of materials excavated or removed.

d. Preservation of Trees

No trees shall be removed outside excavated or filled areas unless their removal is authorized by the **OWNER**. Trees left standing shall be adequately protected from damage by construction activities.

e. Dewatering

Dewatering equipment shall be provided to remove and dispose of all surface water entering excavations, trenches, or other areas of the work.

f. Sheeting and Shoring

Excavations and trenches shall be supported or sloped as necessary to prevent caving or sliding.

g. Drainage Maintenance

Install silt fences, hay bales, and other protective measures to prevent sediment from washing out on roadways and existing drainage structures.

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

OWNER: CITY OF OCALA
PROJECT: _____
PROJECT NO: _____
SYSTEM: _____

I hereby certify that the above referenced system has been:

_____ Installed in accordance with manufacturer's recommendations.
_____ Inspected, checked, serviced, and adjusted.
_____ Electrical and mechanical connections meet applicable codes and safety standards.
_____ System has been performance tested and meets or exceeds specified requirements.

Comments: _____

I, the Manufacturer's Representative, hereby certify that I am authorized to make recommendations required to assure that the equipment furnished is complete and operational. I certify that all information contained herein is true and accurate.

Date: _____

Manufacturer: _____

By: (Manufacturer's Authorized
Representative) _____

FORM WSCM001
(28/93)

SHOP DRAWING/SAMPLE SUBMITTAL FORM

CITY OF OCALA
WATER & SANITARY SEWER
CONSTRUCTION MANUAL

PROJECT NAME		PROJECT CONTRACTOR		PROJECT ENGINEER		SUBMITTAL NUMBER ____		PAGE ____ OF ____	
		COMPANY _____ ADDRESS _____ CITY, STATE, ZIP _____		COMPANY _____ ADDRESS _____ CITY, STATE, ZIP _____		SHOP DRAWING ☐ SAMPLE ☐ SUBMITTAL SUBMITTAL			

CONTRACTOR							CITY OF OCALA					
ITEM NO.	DESCRIPTION	SPECIFICATION	COPIES	MANUFACTURER	MODEL NO.	SIZE	APPROVED			RESUBMIT		COMMENT <u>NUMBER</u>
							YES	AS NOTED	NO	YES	NO	DETAILS/OVER

_____ DATE
 SUBMITTED -Project Contractor

_____ DATE
 REVIEWED – Project Engineer

_____ DATE
 APPROVED – City of Ocala

QUALITY CONTROL

1. TESTING

All tests to determine compliance with the Contract Documents shall be performed in accordance with Paragraph 13.03 of the General Conditions as well as applicable sections of the F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition, and the City of Ocala, Volume III, Standard Specifications, as indicated herein, and as otherwise required in the specifications.

CONTRACTOR shall furnish all sample materials and cooperate in all testing activities, including sampling. **CONTRACTOR** shall interrupt the work when necessary to allow testing, including sampling, to be performed. **CONTRACTOR** shall have no claim for an increase in Contract Price or Contract Times due to such interruption. **CONTRACTOR** shall provide personnel and facilities as necessary to assist in sampling and testing activities.

Testing services provided by **OWNER** are for the sole benefit of **OWNER**; however, test results shall be available to **CONTRACTOR**. Testing necessary to satisfy **CONTRACTOR'S** internal quality control procedures shall be the sole responsibility of **CONTRACTOR**.

1.01 Testing Services Provided by Contractor. Unless otherwise specified, **CONTRACTOR** shall provide all testing services in connection with the following:

Concrete materials and design mixtures.

Masonry units and masonry grout and mortar materials and design mixtures.

Asphaltic concrete materials and design mixtures.

All other tests and engineering data required for **ENGINEER'S** review of materials and equipment proposed to be used in the Work.

1.02 Testing Services Provided by Owner. Unless otherwise specified, **OWNER** shall provide for tests made on the following materials and equipment:

Concrete.

Tests of masonry prisms.

Field control test of masonry.

Asphaltic concrete.

Other materials and equipment at the discretion of **OWNER**.

CONTRACT CLOSEOUT

1.01 Description

Scope of Work: Comply with requirements stated in Conditions of the Contract and in specifications for administrative procedures in closing out of work.

2.01 Substantial Completions

- A. When the **CONTRACTOR** considers the work as substantially complete, the **CONTRACTOR** shall submit to the **OWNER**:
 - 1. A written notice that the work, or designated portion thereof, is substantially complete.
 - 2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, the **OWNER** will make an inspection to determine the status of completion.
- C. Should the **OWNER** determine that the work is not substantially complete:
 - 1. The **OWNER** will promptly notify the **CONTRACTOR** in writing, giving the reasons therefore.
 - 2. The **CONTRACTOR** shall remedy the deficiencies in the Work and send a second written notice of substantial completion to the **OWNER**.
 - 3. The **OWNER** will re-inspect the work.
- D. When the **OWNER** finds that the work is substantially complete, the **OWNER** shall prepare a Certificate of Substantial Completion with a list of items to be completed or corrected before final payment.

3.01 Final Inspection

- A. When the **CONTRACTOR** considers the work complete, the **CONTRACTOR** shall submit written certification that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with Contract Documents.

3. Work has been completed in accordance with Contract Documents.
 4. Equipment and systems have been tested in the presence of the **OWNER** representative and are operational.
- B. The **OWNER** will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should **OWNER** consider that the work is incomplete or defective:
1. The **OWNER** will promptly notify the **CONTRACTOR** in writing, listing the incomplete or defective work.
 2. The **CONTRACTOR** shall take immediate steps to remedy the stated deficiencies, and send a second written certification to the **OWNER** that the Work is complete.
 3. The **OWNER** will re-inspect the work.
- D. When the **OWNER** finds that the work is acceptable under the Contract Documents, the **OWNER** shall request the **CONTRACTOR** make closeout submittals.

4.01 Contractor's Closeout Submittals to Owner

- A. Evidence of compliance with requirements of governing authorities.
- B. Consent of surety to final payment.
- C. Project record documents.
- D. Completion of all submittals as required by Contract Documents.
- E. Evidence of Payment and Release of Liens to requirements of general and supplementary conditions.
- F. Maintenance bond and warranties.
- G. Certificate of Insurance for products and completed operations.
- H. Certificate of Occupancy for all buildings.

5.01 Final Application for Payment

The **CONTRACTOR** shall submit the final Application for Payment in accordance with the procedures and requirements stated in the General Conditions.

APPENDIX

Appendix
Technical
“Specifications Package”

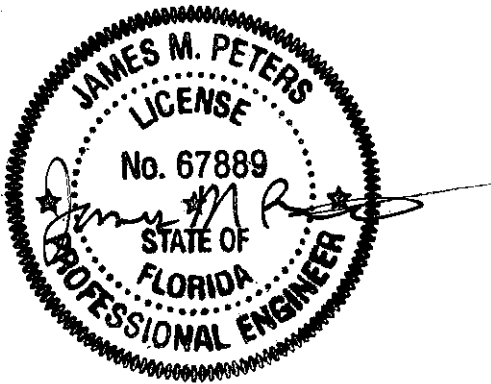
January 17, 2011

SPECIFICATIONS PACKAGE
FOR
City of Ocala, Florida

I hereby certify that this specifications package has been properly prepared by me, or under my responsible charge, in accordance with procedures adopted by the City of Ocala, Florida.

Prepared By: James M. Peters, P.E.
Florida Registration No. 67889

Pages: 1 Through 108



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SPECIAL PROVISIONS

INTENT AND SCOPE.

Please refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, 2010 edition, for any reference made to "Section, Page, Subarticle , or Article" in the following documentation.

ARTICLE 4-1 (Page 19) is expanded by the following:

The Improvements under this Contract consist of Advanced Traffic Management System Phase 1.

The summary of pay items for this project is listed in the plans.

EXAMINATION OF CONTRACT DOCUMENTS AND SITE OF WORK. (REV 2-7-08) (FA 2-13-08) (7-08)

ARTICLE 2-4 (Page 12) is deleted and the following substituted:

2-4 Examination of Contract Documents and Site of Work.

Examine the Contract Documents and the site of the proposed work carefully before submitting a proposal for the work contemplated. 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.

When, in the sole judgment of the City of Ocala Engineering Department, hereinafter referred to as "The City". responses to questions require plans revisions, specifications revisions and/or addenda, City Engineering will issue them as necessary.

The City does not guarantee the details pertaining to borings, as shown on the plans, 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. The Contractor shall examine boring data, where available, and make his own interpretation of the subsoil investigations and other preliminary data, and shall base his bid on his own opinion of the conditions likely to be encountered.

The bidder's submission of a proposal is prima facie evidence that the bidder has made an examination as described in this Article.

UNFORESEEABLE WORK.

(REV 9-28-98) (1-10)

ARTICLE 4-4 (Page 30) is deleted and the following substituted:

4-4 Unforeseeable Work.

When The City requires work that is not covered by a price in the Contract and such work does not constitute a "Significant Change" as defined in 4-3.1, and The City finds that such work is essential to the satisfactory completion of the Contract within its intended scope, The City will make an adjustment to the Contract. Such adjustment will be made by Work Order when the Contract Documents provide for Contingency Work. When the Contract Documents do not provide for Contingency Work or the available funds for Contingency Work are insufficient, such adjustment will be made by Supplemental Agreement. The cost of unforeseeable work will be a negotiated amount or, in lieu of negotiations or other agreement, an amount based on material invoices, equipment costs, labor payrolls, and markups provided in 4-3.2.

Contingency Work, as used in this Article, is defined as possible additional work required to satisfactorily complete the Contract within its intended scope.

UTILITY WORK.

(REV 2-10-94) (1-10)

SUBARTICLE 7-11.6.3 (Pages 69 and 70) is expanded by the following:

For this project, no utility work involving facilities owned by other agencies is anticipated.

PROSECUTION AND PROGRESS.

(REV 5-15-07) (5-07)

SUBARTICLE 8-6.4 (Page 84) is expanded by the following:

A "Special Event" is defined as a festival, fair, run, race, motorcade, parade, civic activity, cultural activity, charity or fund drive, sporting event, or similar activity that could be negatively impacted as a result of the Work. The Contractor shall be responsible for obtaining information concerning any Special Events that occur during the life of the contract. Special Events include, but are not limited to, **University of Florida Home Football Games and Gator Nationals**. All Special Events will be handled in the same manner as Holidays and in accordance with this subarticle.

TRAFFIC MONITORING SITE VEHICLE SENSOR (CLASS II).
(REV 6-16-99) (FA 7-20-99) (1-10)

PAGE 813. The following new Section is added after Section 715:

SECTION 741

TRAFFIC MONITORING SITE VEHICLE SENSOR (CLASS II)

741-1 Description.

Install Traffic Monitoring Site (TMS) Class II Vehicle Sensor of the type and at the location(s) shown on the plans.

741-2 Materials.

Use a Vehicle Sensor currently listed on The FDOT's Approved Products List (APL) and compatible with the electronic unit to which they will be connected meeting the following requirements:

Type 1	
	Unencapsulated
Sensor Size	6 to 8 feet long Flat Element: 3/16 to 1/4 inch wide
Encapsulant	Not Encapsulated
Sensing Element	Pressure sensing polymer in flat coax construction
Operating Temp.	-40°F to 158°F
Output Signal	250 mV for 400 pound wheel load at 70°F Minimum
Polarization	Increase in pressure produces positive voltage
Output Uniformity	± 20%
Capacitance	7.2 nF for 6 foot long sensor with 100 foot cable
Temperature Sensitivity	2% per degree Fahrenheit
Transmission Frequency	N/A
Transmission Power	N/A
Coverage Area	N/A
Detection Zone	N/A
Enclosure	N/A
Power	N/A

Ensure that the Vehicle Sensor is marked in accordance with Section 748 and the markings are visible after installation.

Use bonding agents listed on the APL and which are approved for use with the sensor being installed.

The approval process for equipment and/or material(s) used at a Traffic Monitoring Site is covered in Section 748.

741-3 Installation Requirements.

741-3.1 General: Install the Vehicle Sensor in accordance with the manufacturer's recommended installation procedure, and the Contract Documents.

741-3.2 Saw Cuts: Use a chalk line or equivalent method to outline the perimeter of the sensor on the pavement and routes for lead-in cables. Do not allow the saw cut in the pavement to deviate more than 1 inch from the chalk line. Ensure that all saw cuts are free of any dust, dirt or other debris and completely dry prior to the installation of the loop wire, loop wire twisted pair lead or lead-in cable.

Make saw cuts sufficient in depth to ensure that the top conductor of the loop wire or lead-in cable is a minimum of 3 inches below the final surface of the roadway.

741-3.3 Piezoelectric Axle Sensor (Type I):

741-3.3.1 General: Install the sensor in the right wheelpath of the travel lane, with the lead-in cable orientated toward the pull box to which the lead-in cable will be pulled. Ensure that the end of the sensor element or channel is 6 inches from the right edge of the travel lane, unless otherwise specified in the Contract Documents. Ensure that all lead-in cable(s) are sufficient in length to extend to the traffic monitoring site cabinet without splicing.

741-3.3.1 Unencapsulated Sensor: Install the unencapsulated sensor by sawing a slot into the pavement perpendicular to the flow of traffic, equal to the length of the sensor plus 4 by 3/4 inch wide by 3/4 inch deep. Suspend the sensor within the slot with jigs. Prepare and apply bonding agent in accordance with the sensor manufacturer instructions, ensuring that there are no voids around the sensor and the bonding agent cures to bear traffic within four hours of application. Remove the jigs after the bonding agent has cured. Route the sensor lead-in cable(s) to the pull box and through the conduit to the traffic monitoring site cabinet. Mark the sensor lead-in cable(s) at the pull boxes and at the point of termination within the traffic monitoring site cabinet with an indelible marker, numbering the lanes as specified in the Design Standards.

741-4 Piezoelectric Axle Sensor Test Requirements.

Perform the manufacturer's recommended on-site pre-installation test to determine the sensor's condition. Install only those sensors that pass the pre-installation test. Repeat the test, following installation, at the lead-in point of connection in the traffic monitoring site cabinet. Remove and replace any sensor which fails the test at no additional cost to The City.

Record representative waveforms for a passenger car, single unit truck, and a tractor/semi-trailer combination vehicle, for each piezoelectric axle sensor. This requirement may be waived by the Engineer if one or more of these vehicles are not in the traffic stream.

Place a copy of the final test results, including the date of installation, manufacturer's name, model number for each sensor, type of bonding agent used and recorded waveforms, in a waterproof package in the cabinet and furnish one copy to the Engineer.

741-5 Guaranty Provisions.

741-5.1 Contractor's Responsibility: Secure all guaranties that are customarily issued by the equipment manufacturers for the specific equipment included in the Contract. Ensure that the form in which such guaranties are delivered includes the provision that they are subject to transfer to The City, and is accompanied by proper validation of such fact. Transfer guaranties at final acceptance of the work (or equipment) by The City.

741-5.2 Terms: Ensure that the manufacturers of the equipment stipulate the terms of guaranties when submitting a request to The City for certification and for equipment submittal for construction projects. Include terms for a specified service performance with provisions for repair parts and labor, or for replacement. Provisions shall define the equipment "installation date" as the date for such guaranty to be in effect. For construction projects, the "installation date" is the first day of equipment "burn-in". For warehouse purchases, the "installation date" is the date of visual inspection approval, not to exceed ten days after delivery date.

741-5.3 Conditions: When guaranty is available, ensure that a written and signed guaranty accompanies the manufacturer's billing invoice. The Engineer will sign and retain the original and provide a copy to the manufacturer. If the Contractor does not comply with the terms of the guaranty, The City may suspend the certification. Comply with additional terms and conditions as stated in purchasing agreements.

741-6 Method of Measurement.

741-6.1 General: Measurement for payment will be in accordance with the following tasks.

741-6.2 Furnish and Install: The Contract unit price each for Vehicle Sensor (Class II), furnished and installed, includes the Vehicle Sensor (Class II), lead-in cable(s), bonding agent, all equipment, materials, and labor necessary for a complete and accepted installation.

741-6.3 Furnish: The Contract unit price each for Vehicle Sensor (Class II), furnished, includes the Vehicle Sensor (Class II) and materials as specified in the Contract Documents, plus all shipping and handling costs involved in the delivery as specified in the Contract Documents.

741-6.4 Install: The Contract unit price each for Vehicle Sensor (Class II), installed, includes all lead-in cable(s), bonding agent, miscellaneous materials, labor, and equipment necessary for a complete and accepted installation. The Engineer will supply the Vehicle Sensor (Class II).

741-6.5 Modify: The Contract unit price each for Vehicle Sensor (Class II), modified, as specified in the Contract Documents, includes all labor, equipment and miscellaneous materials necessary for a complete and accepted installation.

741-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 741- 70- 111

TMS Vehicle sensor (Class II) - each.

SECTION 745 TRAFFIC MONITORING SITE INDUCTIVE LOOP ASSEMBLY

745-1 Description.

Install Traffic Monitoring Site (TMS) Inductive Loop Assembly at the location(s) shown in the plans.

745-2 Materials.

Use Inductive Loop Assembly components listed on The FDOT's Approved Products List (APL) as compatible with the other components installed at the location meeting the following requirements:

Loop Wire	Section 660*
Lead-In Cable	Section 660**
Splicing Material.....	Section 660
Loop Sealant	Section 660
Pull and Junction Boxes.....	Section 635***
Conduit.....	Section 630

*Use only #12 AWG wire.

**Use #14 AWG wire.

***Ensure that the body is constructed of Quazite or Approved equivalent product, unless otherwise specified in the plans.

745-3 Installation Requirements.

745-3.1 General: Install Inductive Loop Assembly components and materials in accordance with the plans and the Design Standards.

745-3.2 Saw Cuts: Use a painted line or equivalent method to outline the perimeter of the loop on the pavement and routes for lead-in cables. Do not allow the saw cut in the pavement to deviate by more than 1 inch from the painted line. Ensure that all saw cuts are free of any dust, dirt or other debris and completely dry prior to the installation of the loop wire, loop wire twisted pair lead or lead-in cable.

Make saw cuts sufficient in depth to ensure that the top conductor of the loop wire or lead-in cable is a minimum of 1 inch below the final surface of the roadway.

745-3.3 Loop Wire: Ensure that all loops are three complete turns of wire, wound in a clockwise manner. Do not damage the insulation.

Tag and identify the clockwise "lead" of each loop.

Use alternate polarity on adjacent loops.

Ensure that the hold down material is not longer than 1 inch and that the distance from the top of the hold down material to the final surface of the roadway is not less than 1 inch.

745-3.4 Loop Wire Twisted Pair Lead: Create a loop wire twisted pair lead by twisting the loop wire pair a minimum of 10 to 12 twist per foot from the edge of the loop to the pull box located adjacent to the roadway. Place only one loop wire twisted pair lead in a saw cut. Ensure that the distance between a twisted loop wire pair lead within the roadway is a minimum of

6 inches from any other twisted loop wire pair lead or loop, until they are within 12 inches of the edge of pavement or curb, at which point they may be placed closer together.

Provide a minimum of 3 feet of twisted loop wire pair lead in the pull box located adjacent to the roadway. Do not route twisted loop wire pair lead directly through conduits to the cabinet, unless specified in the plans.

745-3.5 Loop Sealant: Prepare and apply the loop sealant in accordance with the manufacturer's instructions. Remove excess sealant from the surface of the roadway. Ensure that the loop sealant has cured completely before allowing vehicular traffic to travel over the sealant.

745-3.6 Shielded Lead-In Cable: Splice loop wire twisted pair lead to the International Municipal Signal Association, Inc. (IMSA) Specification 50-2 shielded lead-in cable in the pull box located adjacent to the roadway. Splice cables in pull boxes only. Perform all splices in accordance with the Design Standards, Index No. 17781.

Ensure that the shielded lead-in cable is of sufficient length to extend through the conduits to the cabinet without further splicing. Do not pull more than 250 feet of loop lead-in cable between pull boxes or a pull box and the cabinet.

745-4 Guaranty Provisions.

745-4.1 Contractor's Responsibility: Secure all guaranties that are customarily issued by the equipment manufacturers for the specific equipment included in the Contract. Ensure that the form in which such guaranties are delivered includes the provision that they are subject to transfer to The City, and is accompanied by proper validation of such fact. Transfer guaranties at final acceptance of the work (or equipment) by The City.

745-4.2 Terms: Ensure that the manufacturers of the equipment stipulate the terms of guaranties when submitting a request to The City for certification and for equipment submittal for construction projects. Include terms for a specified service performance with provisions for repair parts and labor, or for replacement. Provisions shall define the equipment "installation date" as the date for such guaranty to be in effect. For construction projects, the "installation date" is the first day of equipment "burn-in". For warehouse purchases, the "installation date" is the date of visual inspection approval, not to exceed ten days after delivery date.

745-4.3 Conditions: When guaranty is available, ensure that a written and signed guaranty accompanies the manufacturer's billing invoice. The Engineer will sign and retain the original and provide a copy to the manufacturer. If the Contractor does not comply with the terms of the guaranty, The City may suspend the certification. Comply with additional terms and conditions as stated in purchasing agreements.

745-5 Method of Measurement.

745-5.1 General: Measurement for payment will be in accordance with the following tasks.

745-5.2 Furnish and Install: The Contract unit price per assembly for Inductive Loop Assembly furnished and installed, includes loop wire, loop sealant and shielded lead-in cable, all equipment, materials, and labor necessary for a complete and accepted installation.

745-5.3 Furnish: The Contract unit price per assembly for Inductive Loop Assembly, furnished, includes all components and materials as specified in the Contract Documents, plus all shipping, and handling costs involved in the delivery as specified in the Contract Documents.

745-5.4 Install: The Contract unit price per assembly for Inductive Loop Assembly, installed, will include all materials and labor necessary for a complete and accepted installation. The Engineer will supply the Inductive Loop Assembly components as specified in the Contract Documents.

745-6 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, except Conduit and Pull and Junction Boxes.

Conduit will be paid for as specified in Section 630 and Pull and Junction Boxes will be paid for as specified in Section 635.

Payment will be made under:

Item No. 745- 70- 12 TMS Inductive Loop Assembly - per assembly.

SECTION 746 TRAFFIC MONITORING SITE CABINET

746-1 Description.

Install Type IIIC Traffic Monitoring Site (TMS) Cabinet as shown in the plans.

746-2 Materials.

746-2.1 General: Only use Traffic Monitoring Site Cabinet and/or components currently listed on The FDOT's Approved Products List (APL). Ensure that the cabinet and components are compatible with the other components installed at the location. Ensure that the Traffic Monitoring Site Cabinet is marked in accordance with Section 748 and that the markings are visible after installation.

The approval process for equipment and/or material(s) used at a Traffic Monitoring Site is covered in Section 748.

746-2.2 Cabinet: Provide a cabinet constructed of 0.125 inch sheet aluminum Type 5052-H32. Ensure that all exterior seams are continuously welded, smooth, free of cracks, blow holes or other irregularities and the inside and outside edges are free of burrs. Ensure that the outside surface of the cabinet has a smooth, uniform, and natural finish and the cabinet top has a sloped surface to prevent accumulation of water.

Provide a vent between the top of the door and the top of the cabinet, covered by screen material with a maximum opening of 0.125 inch.

746-2.3 Cabinet Door: Equip the cabinet with a continuously hinged door constructed of 14 gauge stainless steel or 0.125 inch aluminum that occupies 80% of the front surface area of the cabinet and is rain and dust tight. Install the door such that it is hinged on the right side of the cabinet. Ensure that the hinge pin is stainless steel and capped at the top and bottom to deter tampering. Construct the door double flanged on all four sides and equip it with a restraint that will hold the door open in the 90 degree and 120 degree position.

Use a three point latching system, consisting of the following latch points:

(1) Center of the cabinet - latching handle with provisions for a padlock in the center position;

(2) Top of the cabinet - controlled by the door handle; and

(3) Bottom of the cabinet - controlled by the door handle.

Ensure that latching points (2) and (3) remain in the locked position until the latching handle is rotated to the unlocked position.

Provide the cabinet door with louvered vents meeting the NEMA rod entry test for 3R enclosures. Ensure that the louvers are covered by a replaceable air filter mounted inside the cabinet door with either brackets or clamps that will allow easy removal and replacement.

746-2.4 Shelf: Ensure that the cabinet has an adjustable shelf, constructed of 0.08 inch thick aluminum, that is adjustable to within 15 inches of the top of the cabinet and to within 26 inches of the bottom of the cabinet in 2 inches increments.

746-2.5 Cabinet Sizes: Minimum dimension for the cabinet is:

Type IIIC – 32 inches high, 25 inches wide, 14 inches deep;

746-2.6 Backplane and Cabinet Cable: Furnish and Install as specified in the Contract Documents.

746-3 Installation Requirements.

746-3.1 General: Install the Traffic Monitoring Site Cabinet in accordance with the plans, Design Standards and manufacturer's recommended installation procedure. Ensure that all conduit entrance holes or other holes which are field drilled are reamed and free of burrs. Make all conduit connections to the cabinet watertight by the use of clear silicone rubber sealant. Perform all excavation and/or backfill in accordance with 125-4 and 125-8.2.

746-3.3 Pedestal Mounted (Type IIIC) Traffic Monitoring Site Cabinets: Construct the base for the cabinet with concrete meeting the requirements of Section 347 and finish the surface smooth and level.

Temporarily seal the ends of the conduit risers located in the base before placing concrete. Ensure that the end of the conduit riser(s) is a minimum of 2 inches above the finished surface of the concrete base.

Use anchor bolts to fasten base mounted cabinet to the concrete base. Seal the joint between the bottom of the cabinet and the concrete base (inside and outside of cabinet) with a clear silicone rubber sealant.

746-3.4 Grounding: Ground the Traffic Monitoring Site Cabinet in accordance with the requirements of Section 620.

Keep the ground wire from the cabinet ground bussbar to the ground rod assembly or array as short as possible.

746-4 Guaranty Provisions.

746-4.1 Contractor's Responsibility: Secure all guaranties that are customarily issued by the equipment manufacturers for the specific equipment included in the Contract. Ensure that the form in which such guaranties are delivered includes the provision that they are subject to transfer to The City, and is accompanied by proper validation of such fact. Transfer guaranties at final acceptance of the work (or equipment) by The City.

746-4.2 Terms: Ensure that the manufacturers of the equipment stipulate the terms of guaranties when submitting a request to The City for certification and for equipment submittal for construction projects. Include terms for a specified service performance with provisions for repair parts and labor, or for replacement. Provisions shall define the equipment "installation date" as the date for such guaranty to be in effect. For construction projects, the "installation date" is the first day of equipment "burn-in". For warehouse purchases, the "installation date" is the date of visual inspection approval, not to exceed 10 days after delivery date.

746-4.3 Conditions: When guaranty is available, ensure that a written and signed guaranty accompanies the manufacturer's billing invoice. The Engineer will sign and retain the original and provide a copy to the manufacturer. If the Contractor does not comply with the terms of the guaranty, The City may suspend the certification. Comply with additional terms and conditions as stated in purchasing agreements.

746-5 Method of Measurement.

746-5.1 General: Measurement for payment will be in accordance with the following tasks.

746-5.2 Furnish and Install: The Contract unit price each for Traffic Monitoring Site Cabinet, furnished and installed, includes the Traffic Monitoring Site Cabinet and/or components as specified in the Contract Documents, all equipment, materials, and labor necessary for a complete and accepted installation.

746-5.3 Furnish: The Contract unit price each for Traffic Monitoring Site Cabinet, furnished, includes the Traffic Monitoring Site Cabinet and/or components as specified in the Contract Documents, plus all shipping and handling costs involved in the delivery as specified in the Contract Documents.

746-5.4 Install: The Contract unit price each for Traffic Monitoring Site Cabinet, installed, will include all materials and labor necessary for a complete and accepted installation. The Engineer will supply the Traffic Monitoring Site Cabinet and/or components as specified in the Contract Documents.

746-6 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 746- 71- 131 TMS Cabinet - each.

TRAFFIC MONITORING SITE MODEM.

(REV 5-20-99) (FA 7-20-99) (1-10)

PAGE 813. The following new Section is added after Section 715:

SECTION 747 TRAFFIC MONITORING SITE MODEM

747-1 Description.

Install Traffic Monitoring Site (TMS) Modem in cabinet at traffic monitoring site at the location shown in the plans.

747-2 Materials.

747-2.1 General: Use a Invisi-Connect or Approved Equivalent Traffic Monitoring Site Modem currently listed on The FDOT's Approved Products List (APL) compatible with the other components installed at the location.

The approval process for equipment and/or material(s) used at a Traffic Monitoring Site is covered in Section 748.

747-2.2 Modem: Provide a modem meeting the following requirements:

- (a) Modem Consultative Committee International Telephone and Telegraph (CCITT), V.32 bis, V.32, V.22 bis, V.22, V.21, Bell 103 and 212A,
- (b) Error correction MNP 2-4, and V.42,
- (c) Data compression MNP 5 and V.42 bis,
- (d) Operating voltage input of 8v DC to 24v DC or higher,
- (e) Power consumption of less than three W in active mode and less than 100mW in standby mode,
- (f) Dimensions of approximately 8 inches (L) by 5 inches (W) by 1 9/16 inches (H),
- (g) Weight of approximately 2 pounds, shelf mounted,
- (h) Operating temperature range of -4° to 158° F,
- (i) Equipped with a DB-25 female connection (RS-232 config.), 2-RJ-11 phone connections, 1/8 inch female power connection, and
- (j) Interface speed auto-adjustable from 300 to 14,400 bps.

Furnish and install all cables required to connect the modem to the electronics unit and telephone service junction box provided by the contractor.

747-2.3 Equipment Warranty: Ensure that The City is shown as the original owner of the component(s). Remove and replace any non-functioning component(s) of the Traffic Monitoring Site Modem furnished and installed at no additional cost to The City.

747-2.4 Commercial Software Registration: Ensure that The City is registered as the end-user of software installed on the system communications.

747-3 Installation Requirements.

747-3.1 General: Install the Traffic Monitoring Site Modem in accordance with the manufacturer's recommended installation procedure, unless otherwise specified in the Contract Documents.

747-3.2 Telephone Service: Furnish and install all material necessary to bring telephone service from the telephone company installed junction box to the Traffic Monitoring Site Cabinet.

747-4 Guaranty Provisions.

747-4.1 Contractor's Responsibility: Secure all guaranties that are customarily issued by the equipment manufacturers for the specific equipment included in the Contract. Ensure that the form in which such guaranties are delivered includes the provision that they are subject to transfer to The City, and is accompanied by proper validation of such fact. Transfer guaranties at final acceptance of the work (or equipment) by The City.

747-4.2 Terms: Ensure that the manufacturers of the equipment stipulate the terms of guaranties when submitting a request to The City for certification and for equipment submittal for construction projects. Include terms for a specified service performance with provisions for repair parts and labor, or for replacement. Provisions shall define the equipment "installation date" as the date for such guaranty to be in effect. For construction projects, the "installation date" is the first day of equipment "burn-in". For warehouse purchases, the "installation date" is the date of visual inspection approval, not to exceed ten days after delivery date.

747-4.3 Conditions: When guaranty is available, ensure that a written and signed guaranty accompanies the manufacturer's billing invoice. The Engineer will sign and retain the original and provide a copy to the manufacturer. If the Contractor does not comply with the terms of the guaranty, The City may suspend the certification. Comply with additional terms and conditions as stated in purchasing agreements.

747-5 Method of Measurement.

747-5.1 General: Measurement for payment will be in accordance with the following tasks.

747-5.2 Furnish and Install: The Contract unit price each for Traffic Monitoring Site Modem, furnished and installed, will include all equipment, materials, and labor necessary for a complete and accepted installation.

747-5.3 Furnish: The Contract unit price each for Traffic Monitoring Site Modem, furnished, will include all equipment, materials, plus all shipping and handling costs involved in the delivery as specified in the Contract Documents.

747-5.4 Install: The Contract unit price each for Traffic Monitoring Site Modem, installed, will include all materials and labor necessary for a complete and accepted installation. The contractor will supply the Traffic Monitoring Site Modem.

747-6 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 747-1 TMS System Communications Modem - per each

**GENERAL REQUIREMENTS FOR THE EVALUATION OF TRAFFIC MONITORING
SITE EQUIPMENT AND MATERIALS.**

(REV 5-12-99) (FA 7-20-99) (1-10)

PAGE 813. The following new Section is added after Section 715:

**SECTION 748
GENERAL REQUIREMENTS FOR THE EVALUATION
OF TRAFFIC MONITORING SITE EQUIPMENT AND MATERIALS**

748-1 Description.

This Section describes the requirements that must be met by manufacturers, suppliers, vendors or Contractors in order to provide equipment or materials for use on Traffic Monitoring Sites. A Traffic Monitoring Site is defined as a site used by The City for monitoring the volume, speed, number of axles, weight of wheels, axles or vehicles, and/or vehicular axle classification types. The site may consist of a combination of the following components, all of which must be listed on The City's Approved Products List, except as provided for below. Material and installation requirements of each component are covered in the Section listed.

Component	Section
Vehicle Sensors	741
Speed/Classification Unit	743
Solar Power Unit	744
Inductive Loop Assembly	745
Cabinet	746
Modem	747

748-2 Traffic Monitoring Site Component Approval Process

Furnish and install traffic monitoring pedestal mount cabinet per city of Ocala and Florida Department of Transportation Standard Specifications for Road and Bridge Construction, 2010 edition, and FDOT design standards 2008 edition, indexes 17503, 17721, 17841, and 17900.

All loops and piezos are to be tested with the city of Ocala Traffic Engineering personnel present and all readings are to be left in cabinet. Contact: Camile A. Mathews two (2) full business days prior to any testing.

748-3 Marking of Approved Equipment.

748-3.1 Manufacturer's Identification: All traffic monitoring site equipment furnished and/or installed is to be marked by the manufacturer with a permanently affixed ID plate or stamp, bearing the name or trademark of the manufacturer and the part number.

748-3.2 Certification Number: Ensure that the Florida Department of Transportation certification number is permanently affixed.

1. For electrical/electronic devices such as vehicle detectors, the manufacturer, vendor, supplier or Contractor shall permanently affix the certification number on the top front center of the electrical/electronic device with a tamper proof, water resistant label.

2. For cabinets, affix the certification number shall be permanently affixed on the inside of the cabinet door by the manufacturer, vendor, supplier or Contractor.

SUPPLEMENTAL SPECIFICATIONS

002 PREQUALIFICATION OF BIDDERS.
(REV 6-2-09) (FA 6-4-09) (1-10)

The contractor must be a certified with the Florida Department of Transportation to perform ITS contract work:

Florida Law (Chapter 337.14 F.S.) and Rules of the State of Florida, Department of Transportation, Chapter 14-22, require contractors to be prequalified with the Department in order to bid for the performance of road, bridge, or public transportation construction contracts greater than \$250,000.00.

The contractor must be prequalified by the Florida Department of Transportation under rule 14-22, Florida Administrative Code, in the following type of work:

Intelligent Transportation Systems

ARTICLE 2-1 (Pages 9 and 10). The fifth paragraph is deleted and the following substituted:

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017 F.S., for Category Two. All restrictions apply for a period of 36 months from the date of placement on the convicted vendor list.

004 SCOPE OF THE WORK.
(REV 7-28-09) (FA 7-30-09) (1-10)

ARTICLE 4-6 (Pages 30 and 31) is deleted and the following substituted:

4-6 Final Cleaning Up of Right-of-Way.

Upon completion of the work, and before The City accepts the work and makes final payment, remove from the right-of-way and adjacent property all falsework, equipment, surplus and discarded materials, rubbish and temporary structures; restore in an acceptable manner all property, both public and private, that has been damaged during the prosecution of the work; and leave the waterways unobstructed and the roadway in a neat and presentable condition throughout the entire length of the work under Contract. Do not dispose of materials of any character, rubbish or equipment, on abutting property, with or without the consent of the property owners. The Engineer will allow the Contractor to temporarily store equipment, surplus materials, usable forms, etc., on a well-kept site owned or leased by the Contractor, adjacent to the project. However, do not place or store discarded equipment, materials, or rubbish on such a site.

Shape and dress areas adjacent to the project right-of-way that were used as plant sites, materials storage areas or equipment yards when they are no longer needed for such purposes.

Restore these areas in accordance with 7-11.1 and 7-11.2. Grass these areas when the Engineer directs.

007 LEGAL REQUIREMENTS AND RESPONSIBILITY TO THE PUBLIC.
(REV 07-16-09) (FA 7-30-09) (1-10)

SUBARTICLE 7-1.4 (Page 59) is deleted and the following substituted:

7-1.4 Compliance with Federal Endangered Species Act and other Wildlife Regulations: The Federal Endangered Species Act requires that The City investigate the potential impact to a threatened or endangered species prior to initiating an activity performed in conjunction with a highway construction project. If The City's investigation determines that there is a potential impact to a protected, threatened or an endangered species, The City will conduct an evaluation to determine what measures may be necessary to mitigate such impact. When mitigation measures and/or special conditions are necessary, these measures and conditions will be addressed on the plans or in permits as identified in 7-2.1.

In addition, in cases where certain protected, threatened or endangered species may unexpectedly be found or appear within close proximity to the project boundaries, The City has established guidelines that will apply when interaction with certain species occurs, absent of any special mitigation measures or permit conditions otherwise identified for the project.

These guidelines are posted at the following URL address:

www.dot.state.fl.us/specificationoffice/Implemented/URLinSpecs/Files/endangeredwildlifeguidelines.pdf.

Take responsibility to obtain this information and take all actions and precautions necessary to comply with the conditions of these guidelines during all project activities.

Prior to establishing any off-project activity in conjunction with a project, notify the Engineer of the proposed activity. Covered activities include but are not necessarily limited to borrow pits, concrete or asphalt plant sites, disposal sites, field offices, and material or equipment storage sites. Include in the notification the Financial Project ID, a description of the activity, the location of the site by township, range, section, county, and city, a site location map including the access route, the name of the property owner, and a person to contact to arrange a site inspection. Provide this notification sufficiently in advance of planned commencement of the off-site activity, to allow a reasonable period of time for the Engineer to conduct an investigation without delaying job progress.

Do not perform any off-project activity without obtaining written clearance from the Engineer. In the event The City's investigation determines a potential impact to a protected, threatened or endangered species and mitigation measures or permits are necessary, coordinate with the appropriate resource agencies for clearance, obtain permits and perform mitigation measures as necessary. Immediately notify the Engineer in writing of the results of this coordination with the appropriate resource agencies. Additional compensation or time will not be allowed for permitting or mitigation, associated with Contractor initiated off-project activities.

SUBARTICLE 7-11.4 (Page 67) is deleted as the following is substituted:

7-11.4 Traffic Signs, Signal Equipment, Highway Lighting and Guardrail: Protect all existing roadside signs, signal equipment, highway lighting and guardrail, for which permanent removal is not indicated, against damage or displacement. Whenever such signs, signal equipment, highway lighting or guardrail lie within the limits of construction, or wherever so directed by the Engineer due to urgency of construction operations, take up and properly store the existing roadside signs, signal equipment, highway lighting and guardrail and subsequently reset them at their original locations or, in the case of widened pavement or roadbed, at locations designated by the Engineer.

If The City determines that damage to such existing traffic signs, signal equipment, highway lighting or guardrail is caused by a third party(ies), and is not otherwise due to any fault or activities of the Contractor, The City will, with the exception of any damage resulting from vandalism, compensate the Contractor for the costs associated with the repairs. Repair damage caused by vandalism at no expense to The City.

Payment for repairs will be in accordance with 4-3.4.

104 PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION.

(REV 6-23-09) (FA 7-9-09) (1-10)

ARTICLES 104-6 through 104-10 (Pages 130-135) are deleted and the following substituted:

104-6 Construction Requirements.

104-6.1 Limitation of Exposure of Erodible Earth: The Engineer may limit the surface areas of unprotected erodible earth exposed by the construction operation and may direct the Contractor to provide erosion or pollution control measures to prevent contamination of any river, stream, lake, tidal waters, reservoir, canal, or other water impoundments or to prevent detrimental effects on property outside the project right-of-way or damage to the project. Limit the area in which excavation and filling operations are being performed so that it does not exceed the capacity to keep the finish grading, turf, sod, and other such permanent erosion control measures current in accordance with the accepted schedule.

Do not allow the surface area of erodible earth that clearing and grubbing operations or excavation and filling operations expose to exceed 750,000 ft² without specific prior approval by the Engineer. This limitation applies separately to clearing and grubbing operations and excavation and filling operations.

The Engineer may increase or decrease the amount of surface area the Contractor may expose at any one time.

104-6.2 Incorporation of Erosion and Sediment Control Features: Incorporate permanent erosion control features into the project at the earliest practical time. Use temporary erosion and sediment control features found in the State of Florida Erosion and Sediment Control Designer and Reviewer Manual (E&SC Manual) to correct conditions that develop during construction which were not foreseen at the time of design, to control erosion and sediment prior

to the time it is practical to construct permanent control features, or to provide immediate temporary control of erosion and sediment that develops during normal construction operations, which are not associated with permanent erosion control features on the project. An electronic version of the E&SC Manual can be found at the following URL:

www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/FLerosionSedimentManual.pdf

Install all sediment control devices in a timely manner to ensure the control of sediment and the protection of lakes, streams, gulf or ocean waters, or any wetlands associated therewith and to any adjacent property outside the right-of-way as required.

At sites where exposure to such sensitive areas is prevalent, complete the installation of any sediment control device prior to the commencement of any earthwork.

After installation of sediment control devices, repair portions of any devices damaged at no expense to The City. The Engineer may authorize temporary erosion and sediment control features when finished soil layer is specified in the Contract and the limited availability of that material from the grading operations will prevent scheduled progress of the work or damage the permanent erosion control features.

104-6.3 Scheduling of Successive Operations: Schedule operations such that the area of unprotected erodible earth exposed at any one time is not larger than the minimum area necessary for efficient construction operations, and the duration of exposure of uncompleted construction to the elements is as short as practicable.

Schedule and perform clearing and grubbing so that grading operations can follow immediately thereafter. Schedule and perform grading operations so that permanent erosion control features can follow immediately thereafter if conditions on the project permit.

104-6.4 Details for Temporary Erosion and Sediment Control Features:

104-6.4.1 General: Use temporary erosion, sediment and water pollution control features found in the E&SC Manual. These features consist of, but are not limited to, temporary turf, rolled erosion control products, sediment containment systems, runoff control structures, sediment barriers, inlet protection systems, silt fences, turbidity barriers, and chemical treatment. For design details for some of these items, refer to the Design Standards and E&SC Manual.

104-6.4.2 Temporary Turf: The Engineer may designate certain areas of turf or sod constructed in accordance with Section 570 as temporary erosion control features. For areas not defined as sod, constructing temporary turf by seeding only is not an option for temporary erosion control under this Section. The Engineer may waive the turf establishment requirements of Section 570 for areas with temporary turf that will not be a part of the permanent construction.

104-6.4.3 Runoff Control Structures: Construct runoff control structures in accordance with the details shown in the plans, the E&SC Manual, or as may be approved as suitable to adequately perform the intended function.

104-6.4.4 Sediment Containment Systems: Construct sediment containment systems in accordance with the details shown in the plans, the E&SC Manual, or as may be approved as suitable to adequately perform the intended function. Clean out sediment containment systems as necessary in accordance with the plans or as directed.

104-6.4.5 Sediment Barriers: Provide and install sediment barriers according to details shown in the plans, as directed by the Engineer, or as shown in the E&SC Manual to protect against downstream accumulation of sediment. Sediment Barriers include, but are not limited to synthetic bales, silt fence, fiber logs and geosynthetic barriers.

Reusable barriers that have had sediment deposits removed may be reinstalled on the project as approved by the Engineer.

104-6.4.6 Silt Fence:

104-6.4.6.1 General: Furnish, install, maintain, and remove silt fences, in accordance with the manufacturer's directions, these Specifications, the details as shown on the plans, the Design Standards, and the E&SC Manual.

104-6.4.6.2 Materials and Installation: Use a geotextile fabric made from woven or nonwoven fabric, meeting the physical requirements of Section 985 according to those applications for erosion control.

Choose the type and size of posts, wire mesh reinforcement (if required), and method of installation. Do not use products which have a separate layer of plastic mesh or netting. Provide a durable and effective silt fence that controls sediment comparable to the and the E&SC Manual.

Erect silt fence at upland locations, across ditchlines and at temporary locations shown on the plans or approved by the Engineer where continuous construction activities change the natural contour and drainage runoff. Do not attach silt fence to existing trees unless approved by the Engineer.

104-6.4.6.3 Inspection and Maintenance: Inspect all silt fences immediately after each rainfall and at least daily during prolonged rainfall. Immediately correct any deficiencies. In addition, make a daily review of the location of silt fences in areas where construction activities have changed the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, install additional silt fences as directed by the Engineer.

Remove sediment deposits when the deposit reaches approximately 1/2 of the volume capacity of the silt fence or as directed by the Engineer. Dress any sediment deposits remaining in place after the silt fence is no longer required to conform with the finished grade, and prepare and seed them in accordance with Section 570.

104-6.4.7 Floating Turbidity Barriers and Staked Turbidity Barriers: Install, maintain, and remove turbidity barriers to contain turbidity that may occur as the result of dredging, filling, or other construction activities which may cause turbidity to occur in the waters of the State. The Contractor may need to deploy turbidity barriers around isolated areas of concern such as seagrass beds, coral communities, etc. both within as well as outside the right-of-way limits. The Engineer will identify such areas. Place the barriers prior to the commencement of any work that could impact the area of concern. Install the barriers in accordance with the details shown in the plans or as approved by the Engineer. Ensure that the type barrier used and the deployment and maintenance of the barrier will minimize dispersion of turbid waters from the construction site. The Engineer may approve alternate methods or materials.

Operate turbidity barriers in such a manner to avoid or minimize the degradation of the water quality of the surrounding waters and minimize damage to areas where floating barriers installed.

104-6.4.8 Inlet Protection System: Furnish and install inlet protection systems as shown in the plans, Design Standards and the E&SC Manual.

104-6.4.9 Rolled Erosion Control Products (RECPs):

104-6.4.11.1 General: Install RECPs in locations where temporary protection from erosion is needed. Two situations occur that require artificial coverings. The two situations have differing material requirements, which are described below.

(1) Use RECPs composed of natural or synthetic fiber mats, plastic sheeting, or netting as protection against erosion, when directed by the Engineer, during temporary pauses in construction caused by inclement weather or other circumstances. Remove the material when construction resumes.

(2) Use RECPs as erosion control blankets, at locations shown in the plans, to facilitate plant growth while permanent grassing is being established. For the purpose described, use non-toxic, biodegradable, natural or synthetic woven fiber mats. Install erosion control blankets capable of sustaining a maximum design velocity of 6.5 ft/sec as determined from tests performed by Utah State University, Texas Transportation Institute or an independent testing laboratory approved by The City. Furnish to the Engineer, two certified copies of manufacturers test reports showing that the erosion control blankets meet the requirements of this Specification. Certification must be attested, by a person having legal authority to bind the manufacturing company. Also, furnish two 4 by 8 inch samples for product identification. The manufacturers test records shall be made available to The City upon request. Leave the material in place, as installed, to biodegrade.

104-6.4.10 Chemical Treatment: Provide chemical treatment in accordance with the E&SC Manual. Chemical treatment may be used to clarify turbid or sediment laden water that does not yet meet state water quality standards or as an amendment to other erosion prevention and sediment control products to aid in their performance. The Contractor must provide all of the required toxicity testing information in accordance with the E&SC Manual to the Engineer for review and acceptance prior to using any chemical treatment on the project site.

104-6.5 Removal of Temporary Erosion Control Features: In general, remove or incorporate into the soil any temporary erosion control features existing at the time of construction of the permanent erosion control features in an area of the project in such a manner that no detrimental effect will result. The Engineer may direct that temporary features be left in place.

104-7 Maintenance of Erosion and Sediment Control Features.

104-7.1 General: Provide routine maintenance of permanent and temporary erosion and sediment control features, at no expense to The City, until the project is complete and accepted. If reconstruction of such erosion and sediment control features is necessary due to the Contractor's negligence or carelessness or, in the case of temporary erosion and sediment control features, failure by the Contractor to install permanent erosion control features as scheduled, the Contractor shall replace such erosion control features at no expense to The City. If reconstruction of permanent or temporary erosion and sediment control features is necessary due to factors beyond the control of the Contractor, The City will pay for replacement under the appropriate Contract pay item or items.

Inspect all erosion and sediment control features at least once every seven calendar days and within 24 hours of the end of a storm of 0.50 inches or greater. Maintain all erosion control features as required in the Stormwater Pollution Prevention Plan, Contractor's Erosion Control plan and as specified in the State of Florida Department of Environmental Protection Generic Permit for Stormwater Discharge from Large and Small Construction Activities.

104-7.2 Mowing: The Engineer may direct mowing of designated areas within the project limits when neither the work of Sections 570 nor 580 is included in the Contract. Mow these designated areas within seven days of receiving such order. Remove and properly dispose of all litter and debris prior to the mowing operation. Use conventional and specialized equipment along with hand labor to mow the entire area including slopes, wet areas, intersections, overpasses and around all appurtenances. Mow all areas to obtain a uniform height of 6 inches, unless directed otherwise by the Engineer.

104-8 Protection During Suspension of Contract Time.

If it is necessary to suspend the construction operations for any appreciable length of time, shape the top of the earthwork in such a manner to permit runoff of rainwater, and construct earth berms along the top edges of embankments to intercept runoff water. Provide temporary slope drains to carry runoff from cuts and embankments that are in the vicinity of rivers, streams, canals, lakes, and impoundments. Locate slope drains at intervals of approximately 500 feet, and stabilize them by paving or by covering with waterproof materials. Should such preventive measures fail, immediately take such other action as necessary to effectively prevent erosion and siltation. The Engineer may direct the Contractor to perform, during such suspensions of operations, any other erosion and sediment control work deemed necessary.

104-9 Method of Measurement.

When separate items for temporary erosion control features are included in the Contract, the quantities to be paid for will be: (1) the area, in square yards, of Rolled Erosion Control Products; (2) the area, in acres, of Mowing; including litter and debris removal and disposal, equipment, labor, materials and incidentals (when not included under Sections 570 or 580); (3) the length, in feet, of Runoff Control Structures, measured along the surface of the work constructed; (4) the number of Sediment Containment Systems constructed and accepted; (5) the number of Sediment Containment System Cleanouts accomplished and accepted; (6) the length, in feet, of Sediment Barriers; (7) the length, in feet, of Floating Turbidity Barrier; (8) the length, in feet, of Staked Turbidity Barrier; (9) the number of inlet protection systems; (10) the area, in square yards, of chemical treatment; (11) the number of floc logs or drums of product for chemical treatment.

Upon acceptance by the Engineer, the quantity of floating turbidity barriers, sediment barriers, staked turbidity barriers, and inlet protection devices will be paid for regardless of whether materials are new, used, or relocated from a previous installation on the project.

104-10 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, including construction and routine maintenance of temporary erosion control features and for mowing.

Any additional costs resulting from compliance with the requirements of this Section, other than construction, routine maintenance, and removal of temporary erosion control features and mowing, will be included in the Contract unit prices for the item or items to which such costs are related. The work of Performance Turf designated as a temporary erosion control feature in accordance with 104-6.4.2 will be paid for under the appropriate pay items specified in Sections 570 and 580.

Separate payment will not be made for the cost of constructing temporary earth berms along the edges of the roadways to prevent erosion during grading and subsequent operations. The Contractor shall include these costs in the Contract prices for grading items.

Additional temporary erosion control features constructed as directed by the Engineer will be paid for as unforeseeable work.

In case of repeated failure on the part of the Contractor to control erosion, pollution, or siltation, the Engineer reserves the right to employ outside assistance or to use The City's own forces to provide the necessary corrective measures. Any such costs incurred, including engineering costs, will be charged to the Contractor and appropriate deductions made from the monthly progress estimate.

Payment will be made under:

Item No. 104- 1-	Artificial Coverings/ Rolled Erosion Control Products - per square yard.
Item No. 104- 4-	Mowing - per acre.
Item No. 104- 6-	Slope Drains (Temporary)/ Runoff Control Structures - per foot.
Item No. 104- 7-	Sediment Basins/ Containment Systems - each.
Item No. 104- 9-	Sediment Basin/ Containment system Cleanouts - each.
Item No. 104- 10-	Sediment Barriers – per foot
Item No. 104- 11-	Floating Turbidity Barrier - per foot.
Item No. 104- 12-	Staked Turbidity Barrier - per foot.
Item No. 104- 18	Inlet Protection System – each.
Item No. 104- 19	Chemical Treatment – per square yard.
Item No. 104 – 20	Chemical Treatment (floc logs, drums of product) - each.

105 CONTRACTOR QUALITY CONTROL GENERAL REQUIREMENTS.

(REV 7-16-09) (FA 7-30-09) (1-10)

SUBARTICLE 105-3.2 (Pages 138 and 139) is deleted and the following substituted:

105-3.2 Compliance with the Materials Manual.

Producers of Flexible Pipe shall meet the requirements of Section 6.1, Volume II of The City's Materials Manual, which may be viewed at the following URL:
www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/section61.pdf.

Producers of Precast Concrete Pipe shall meet the requirements of Section 6.2, Volume II of The City's Materials Manual, which may be viewed at the following URL:
[www.dot.state.fl.us/ specifications office/Implemented/URL in Specs/Files/section62.pdf](http://www.dot.state.fl.us/specifications office/Implemented/URL in Specs/Files/section62.pdf).

Producers of Precast Concrete Drainage Structures shall meet the requirements of Section 6.3, Volume II of The City's Materials Manual, which may be viewed at the following URL:
www.dot.state.fl.us/ specifications office/Implemented/URL in Specs/Files/section63.pdf.

Producers of Precast/Prestressed Concrete Products shall meet the requirements of Sections 8.1 and 8.3 of The City's Materials Manual, which may be viewed at the following URLs:
www.dot.state.fl.us/ specifications office/Implemented/URL in Specs/Files/lsection81.pdf.

[www.dot.state.fl.us/specifications/office/Implemented/URL in Specs/Files/section83.pdf](http://www.dot.state.fl.us/specifications/office/Implemented/URL%20in%20Specs/Files/section83.pdf) .

Producers of Precast Prestressed Concrete Products using Self Consolidating Concrete shall meet the requirements of Section 8.4, Volume II of The City's Materials Manual, which may be viewed at the following URL:

[www.dot.state.fl.us/specifications/office/Implemented/URL in Specs/Files/section84.pdf](http://www.dot.state.fl.us/specifications/office/Implemented/URL%20in%20Specs/Files/section84.pdf)

Producers of Incidental Precast/Prestressed Concrete Products shall meet the requirements of Section 8.2, Volume II of The City's Materials Manual, which may be viewed at the following URL:

[www.dot.state.fl.us/specifications/office/Implemented/URL in Specs/Files/section82.pdf](http://www.dot.state.fl.us/specifications/office/Implemented/URL%20in%20Specs/Files/section82.pdf) .

Producers of Portland Cement Concrete shall meet the requirements of Section 9.2, Volume II of The City's Materials Manual, which may be viewed at the following URL:

[www.dot.state.fl.us/specifications/office/Implemented/URL in Specs/Files/section92.pdf](http://www.dot.state.fl.us/specifications/office/Implemented/URL%20in%20Specs/Files/section92.pdf) .

Producers of Structural Steel and Miscellaneous Metal Components shall meet the requirements of Sections 11.1 and 11.2 of The City's Materials Manual, which may be viewed at the following URLs:

[www.dot.state.fl.us/specifications/office/Implemented/URL in Specs/Files/section111.pdf](http://www.dot.state.fl.us/specifications/office/Implemented/URL%20in%20Specs/Files/section111.pdf) .

[www.dot.state.fl.us/specifications/office/Implemented/URL in Specs/Files/section112.pdf](http://www.dot.state.fl.us/specifications/office/Implemented/URL%20in%20Specs/Files/section112.pdf) .

SUBARTICLE 105-8.8 (Page 145). The heading is deleted and the following substituted:

105-8.8 Supervisory Personnel – Post-Tensioned and Movable Bridge Structures:

SUBARTICLE 105-8.8.1 (Page 145) is deleted and the following substituted:

105-8.8.1 General: Provide supervisory personnel meeting the qualification requirements only for the post-tensioned and movable bridge types detailed in this Article. Submit qualifications to the Engineer at the pre-construction conference. Do not begin Construction until the qualifications of supervisory personnel have been approved by the Engineer.

SUBARTICLE 105-8.8.7 (Page 149) is deleted and the following substituted:

105-8.8.7 Post-Tensioning (PT) and Grouting Personnel Qualifications: Perform all stressing and grouting operations in the presence of the Engineer and with personnel meeting the qualifications of this article. Coordinate and schedule all PT and grouting activities to facilitate inspection by the Engineer.

105-8.8.7.1 Post-Tensioning: Perform all PT field operations under the direct supervision of a Level II CTQP Qualified PT Technician who must be present at the site of the post-tensioning work during the entire duration of the operation. For the superstructures of bridges having concrete post-tensioned box or I girder construction, provide at least two CTQP qualified PT technicians, Level I or II, on the work crew. The supervisor of the work crew, who must be a Level II CTQP Qualified PT Technician, may also be a work crew member, in which case, the supervisor shall count as one of the two CTQP qualified work crew members. For PT operations other than the superstructures of post-tensioned box or I girder construction, perform all PT operations under the direct supervision of a Level II CTQP Qualified PT Technician who

must be present at the site of the PT work during the entire duration of the operation. Work crew members are not required to be CTQP qualified.

105-8.8.7.2 Grouting: Perform all grouting field operations under the direct supervision of a Level II CTQP Qualified Grouting Technician who must be present at the site of the grouting work during the entire duration of the operation. For the superstructures of bridges having concrete post-tensioned box or I girder construction, provide at least two CTQP qualified grouting technicians, Level I or II, on the work crew. The supervisor of the work crew, who must be a Level II CTQP Qualified Grouting Technician, may also be a work crew member, in which case, the supervisor shall count as one of two CTQP qualified work crew members. For grouting operations other than the superstructures of post-tensioned box or I girder construction, perform all grouting operations under the direct supervision of a Level II CTQP Qualified Grouting Technician who must be present at the site of the grouting work during the entire duration of the operation. Work crew members are not required to be CTQP qualified.

Perform all vacuum grouting operations under the direct supervision of a crew foreman who has been trained and has experience in the use of vacuum grouting equipment and procedures. Submit the crew foreman's training and experience records to the Engineer prior to performing any vacuum grouting operation.

110 CLEARING AND GRUBBING.

(REV 5-29-09) (FA 7-15-09) (1-10)

SUBARTICLE 110-6.2.1 (Page 154) is deleted and the following substituted:

110-6.2.1 General: Remove the structures in such a way so as to leave no obstructions to any proposed new structures or to any waterways. Pull, cut off, or break off pilings to the requirements of the permit or other Contract Documents, or if not specified, not less than 2 feet below the finish ground line. In the event that the plans indicate channel excavation to be done by others, consider the finish ground line as the limits of such excavation. For materials which are to remain the property of The City or are to be salvaged for use in temporary structures, avoid damage to such materials, and entirely remove all bolts, nails, etc. from timbers to be so salvaged. Mark structural steel members for identification as directed.

120 ACCEPTANCE PROGRAM – GENERAL REQUIREMENTS.
(REV 6-2-09) (FA 6-4-09) (1-10)

SUBRTICLE 120-10.3.1 (Page 173) is deleted and the following substituted:

120-10.3.1 Frequency: Conduct QC sampling and testing at a minimum frequency listed in the table below. The Engineer will perform Verification sampling and tests at a minimum frequency listed in the table below.

Test Name	Quality Control	Verification	Verification of Shoulder-Only Areas, Bike/Shared Use Paths, and Sidewalks
Standard Proctor Maximum Density	One per soil type	One per soil type	One per soil type
Density	One per LOT	One per four LOTS and for wet conditions, the first lift not affected by water	One per two LOTS
Soil Classification	One per Standard Proctor Maximum Density	One per Standard Proctor Maximum Density	One per Standard Proctor Maximum Density

SECTION 400 CONCRETE STRUCTURES

400-1 Description.

Construct concrete structures and other concrete members, with the exception of pavement and incidental concrete construction (which are specified in other Sections).

Refer to Section 450 for prestressed construction requirements additional to the requirements of this Section.

For precast concrete structures meet the requirements of Section 450 for storage, shipping and erection.

400-2 Materials.

Meet the following requirements:

Concrete.....	Sections 346 and 347
Reinforcing Steel.....	Section 415
Water.....	Section 923
Curing Materials.....	*Section 925
Epoxy Bonding Compounds.....	Sections 926 and 937
Joint Materials.....	Section 932
Bearing Pads.....	932-2
Non-Shrink Grout.....	Section 934
Class 5 Applied Finish Coatings.....	Section 975

*The Engineer will allow clean sand and sawdust for certain curing, when and as specified.

400-3 Depth of Footing.

Consider the elevations of the bottoms of footings, as shown in the plans, as approximate only. The Engineer may change dimensions or elevations of footings as necessary to secure a satisfactory foundation. If the elevation of a footing as shown in the plans is changed to a higher or lower elevation, the Engineer will not consider such change as a material change to the original Contract Documents, a waiver of any condition of the Contract, or an invalidation of any of the provisions of the Contract. If the excavation must be carried deeper than shown in the plans to obtain a satisfactory foundation, the Engineer will revise the plans in accordance with one of the following methods:

(a) The Engineer will keep the top of the footing at the elevation shown in the original plans and will increase the thickness to obtain a satisfactory foundation. The Engineer will follow this method when the change in bottom elevation of the footing is 12 inches or less. When this method is followed, place the reinforcing steel the same as if the footings, as shown in the original plans, were placed on a subfooting of plain concrete; make no alteration in the position of the reinforcing bars relative to the top of the footing.

(b) The Engineer will revise the plans and lower the footing, thereby increasing the height of stem, to obtain a satisfactory foundation. Generally, the Engineer will increase the thickness and width of footing over that shown in the original plans. If this method is followed, use the dimensions, sizes, and location of reinforcing steel shown in the revised plans. The Engineer will follow this method when the change in elevation of the bottom of footing exceeds 12 inches.

The Engineer will determine which of the above methods to use.

400-4 Falsework.

400-4.1 Plans: At the Engineer's request, furnish detailed plans for falsework or centering to the Department. The Contractor is responsible for results obtained by using these plans.

400-4.2 Design and Erection: Design and construct all falsework to provide the necessary rigidity and to support the loads without appreciable settlement or deformation. Use screw jacks or hardwood wedges to take up any settlement in the framework, either before or during the placing of concrete. If any weakness develops and the centering shows undue settlement or distortion, stop the work, remove any masonry affected, and strengthen the falsework before resuming work. Support falsework which cannot be founded on a satisfactory footing on piling. Space, drive, and remove the piling in an approved manner.

400-4.3 Camber: Provide camber to correct for settlement and deflection of falsework. Give bridges permanent camber only when shown in the plans.

400-5 Forms.

400-5.1 General: Provide forms, either of wood or metal, that are as follows: (a) externally secured and braced where feasible; (b) substantial and unyielding; (c) of adequate strength to contain the concrete without bulging between supports and without apparent deviation from the neat lines, contours, and shapes shown in the plans. Design forms to withstand the additional forces of vibration without apparent deviation from the desired shape or position. Assemble forms to be mortar-tight. If using lumber forms, construct them of dressed wood of uniform thickness. Use form liners on wooden forms where Class 3 surface finish is specified. Construct assembled forms to render a concrete surface of smooth, uniform finish. Make provisions to remove forms without injury to concrete surfaces. Remove blocks and bracing with the forms, and do not leave any portion of the forms in the concrete. Use the same form system for a type of work throughout.

400-5.2 Inspection and Approval: Do not place concrete in a form until the form has been inspected and approved. Although the Engineer inspects and approves the forms, the Contractor is responsible for obtaining satisfactory concrete surfaces, free from warping, bulging, or other objectionable defects. Pay special attention to the ties and bracing. Where the forms appear to be insufficiently braced or unsatisfactorily built, stop and correct defects to the satisfaction of the Engineer.

400-5.3 Non-metallic Form Materials:

400-5.3.1 Lumber: For all surfaces, use lumber that is not less than 3/4 inch in thickness, dressed, and free of knot holes, loose knots, cracks, splits, warps, and other defects. Proportion the spacing of studs, joists, and wales to exclude warps and bulges and to produce true and accurate concrete surfaces. Only use structurally sound lumber.

400-5.3.2 Form Liners: Use form liners of durable, abrasion resistant materials that are unaffected by water. Use liners with a hard surface texture capable of rendering concrete surfaces of a smooth, uniform texture, without grain marks, patterns, or blemishes. Use form liner material of sufficient thickness to eliminate the reflection of irregularities, undesirable patterns, and marks from the forms to the surfaces. Replace liners as necessary to produce a consistent concrete surface texture. Use form liners in large sheets and with true, tight-fitted

joints which are logically located. Obtain the Engineer's approval of the layout of sheets. Do not use liners which have been patched. Use liner material of the same stock throughout.

400-5.3.3 Plywood: The Contractor may use plywood of not less than 5/8 inch in thickness manufactured with waterproof glue or protected with an approved impervious coating. Do not use pieces with bulged plies or raveled, untrue edges.

400-5.4 Special Requirements:

400-5.4.1 Re-entrant Angles: Use chamfered forms for exterior concrete corners and filleted forms for interior concrete corners. Use chamfers and fillets that are 3/4 by 3/4 inch and are mill-dressed on all sides to uniform dimensions. The Contractor may use plastic or metal chamfers and fillets provided they perform satisfactorily in producing uniform, smooth concrete corner surfaces without honeycomb.

400-5.4.2 Handrails and Parapets: Construct barriers and parapets in accordance with Section 521.

400-5.4.3 End-bent Caps: Do not place forms for end-bent caps until the embankment has been constructed to within 12 inches of the bottom of the cap. Place a mass of embankment that is sufficient to produce the subsidence, displacement, and settlement which may result from the construction of the total embankment.

400-5.4.4 Footings: Where footing concrete can be placed in dry excavation, the Contractor may omit cribs, cofferdams, and forms, subject to compliance with the following limitations and conditions:

- (a) Use this procedure only in locations not exposed to view from traveled roadways.
- (b) Obtain required elevations shown in the plans.
- (c) Obtain neat line dimensions shown in the plans.
- (d) Fill the entire excavation with concrete to the required elevation of the top of the footing.
- (e) The Engineer will determine the volume of footing concrete to be paid for from the neat line dimensions shown in the plans.

400-5.5 Form Alignment, Bracing, and Ties: Construct forms in such manner that they may be adequately secured for alignment, shape, and grade. Use bracing systems, ties, and anchorages that are substantial and sufficient to ensure against apparent deviation from shape, alignment, and grade. Do not drive nails into existing concrete. Do not use bracing systems, ties, and anchorages which unnecessarily deface or mark, or have an injurious or undesirable effect on surfaces that will be a part of the finished surface.

If metal ties and anchorages are to remain in the concrete, construct them so as to permit the removal of metal to at least 1 inch beneath the finished surface of concrete. Use accessories for metal ties and anchorages that allow the removal of metal to the prescribed depth while leaving the smallest possible repairable cavity.

When using wire ties, cut or bend them back from the finished surface of the concrete a minimum of 1 inch. Do not use internal ties of wire when forming surfaces that are exposed to view.

400-5.6 Preparation and Cleaning: Meet the following requirements for the condition of forms at the time of beginning concrete casting:

- (a) Treat all forms with an approved form-release agent before placing concrete. Do not use material which adheres to or discolors the concrete.

- (b) Clean forms of all concrete laitance from previous use and all dirt, sawdust, shavings, loose wire ties and other debris.
- (c) Close and secure all inspection and cleanout holes.

400-5.7 Stay-In-Place Metal Forms:

400-5.7.1 General:

(a) Use of permanent stay-in-place metal forms: Permanent stay-in-place metal forms may be used in lieu of removable forms to form concrete bridge deck slabs only when allowed by design note in the plans, and is subject to the conditions, limitations, and requirements contained herein. Use forms made of corrugated material of cellular or non-cellular construction. Fill form flutes completely with concrete. Do not use fillers, such as sand, Styrofoam, etc. to fill the form flutes.

Stay-in-place metal forms may be used to form the portion of the top slab which lies between the webs of individual steel box girders regardless of the environmental classification.

Prior to using stay-in-place forms, submit detailed plans for approval of the forming system, including method of support and attachment and method of protecting the supporting structural steel components from welding effects. Submit design calculations for the forming system which have been signed and sealed by the Specialty Engineer. Detail stay-in-place forms such that they in no way infringe upon the concrete outline of the slab shown on the plans. Use stay-in-place forms that provide and maintain the dimensions and configuration of the original slab in regards to thickness and slope.

Do not weld stay-in-place metal form supports and connections to structural steel components. Make attachments by permissible welds, bolts, clips, or other approved means. If metal form supports and connections are field welded in place, protect structural steel components from damage by using a shield to guard against weld splatter, weld overrun, arc strikes, or other damaging effects of the welding process. Upon completion of welding, rest the metal form support flush on the supporting steel component. Should any weld spatter, weld overrun, arc strike, or other effects of the welding process be evident or occur to the structural steel component, immediately stop in place welding of the metal form supports for the remainder of the work. In this event, weld all metal form supports off of the structure and erect the forms after prefabrication, or use an alternate approved method of attaching the form supports. Remove improper weldment, repair the supporting steel component for any improper welding technique, and perform all required verification and testing at no expense to the Department and to the satisfaction of the Engineer.

Do not use stay-in-place forms until the forming system has been approved by the Engineer. The Contractor is responsible for the performance of the stay-in-place forms.

(b) Structures designed, detailed, and dimensioned for the use of removable forms: Where stay-in-place metal forms are permitted, the Contractor is responsible and shall obtain the approval of the Engineer for the additional slab thickness, elevation changes, changes in design, etc. to accommodate the use of stay-in-place forms. The Engineer will compute pay quantities of the various components of the structure which are paid on a cubic yard basis from the design dimensions shown on the plans with no allowance for changes in deflection or dimensions necessary to accommodate the stay-in-place forms or concrete to fill the form flutes. The Engineer will limit pay quantities of other Contract items that the Contractor

increases to accommodate the use of stay-in-place forms to the quantity required for the original plan design.

Submit all changes in design details of bridge structural members that support stay-in-place forms, showing all revisions necessary to enable the supporting components to withstand the additional weight of the forms and the weight of the extra concrete required to fill the form flutes. Include with the design calculations a comparative analysis of the stresses in the supporting components as detailed on the Contract plans and as modified to support the forms. Use the identical method of analysis in each case, and do not allow the stresses in the modified components to exceed those of the component as detailed in the Contract plans. Include with the design the adjusted cambers for any changes in deflection over those shown on the original plans. Modify the beams to provide additional strength to compensate for the added dead loads imposed by the use of stay-in-place forms. Obtain the additional strength by adding strands to the prestressed beams or by adding steel material to increase the section modulus of steel girders. Substantiate the added strength by the comparative calculations. Do not use stay-in-place forms until the forming system and all necessary design revisions of supporting members have been approved by the Engineer.

(c) Structures designed, detailed, and dimensioned for the use of stay-in-place metal forms: Prior to using stay-in-place forms, submit detailed plans for approval of the forming system (including method of support and attachment) together with design calculations. Include an analysis of the actual unit weight of the proposed forming system over the projected plan area of the metal forms. If the weight thus calculated exceeds the weight allowance for stay-in-place metal forms and concrete required to fill the form flutes shown on the plans, then modify the supporting components to support the excess in weight as stipulated in 400-5.7.1(b).

(d) Painting of top flange: For all structures utilizing structural steel supporting components for which stay-in-place metal forms are to be used, paint the vertical sides of the top flange prior to installation of the stay-in-place forms in accordance with 560.

(e) Zinc coating of supports and connections: Apply a zinc paint coating in accordance with Section 562 to all welded areas of supports and to accessories cut from galvanized sheets, which are not embedded in concrete.

400-5.7.2 Materials: Fabricate permanent stay-in-place metal forms and supports from steel meeting the requirements of ASTM A 653 having a coating designation G165. Do not use form materials that are less than 22 gauge in thickness.

400-5.7.3 Design: Meet the following criteria for the design of permanent bridge deck forms:

(1) Design the forms on the basis of deadload of form, reinforcement, and plastic concrete plus 50

² lb/ft² for construction loads. Use a unit working stress in the steel sheet of not more than 0.725 of the specified minimum yield strength of the material furnished, but not to exceed 36,000 psi.

(2) Do not allow deflection under the weight of the forms, reinforcement, and plastic concrete to exceed 1/180 of the form span or 1/2 inch, whichever is less, for form spans of 10 feet or less, or 1/240 of the form span or 3/4 inch, whichever is less, for form spans greater than 10 feet. In all cases, do not use a loading that is less than 120 psf total.

(3) Use a design span of the form equal to the clear span of the form plus 2 inches. Measure the span parallel to the form flutes.

- (4) Compute physical design properties in accordance with requirements of the AISI Specifications for the Design of Cold Formed Steel Structural Members, latest published edition.
- (5) For all reinforcement, maintain the design concrete cover required by the plans.
- (6) Maintain the plan dimensions of both layers of primary deck reinforcement from the top surface of the concrete deck.
- (7) Do not consider the permanent bridge deck form as lateral bracing for compression flanges of supporting structural members.
- (8) Do not use permanent steel bridge deck forms in panels where longitudinal deck construction joints are located between stringers.
- (9) Secure forms to the supporting members by means other than welding directly to the member.

400-5.7.4 Construction: Install all forms in accordance with approved fabrication and erection plans.

Do not rest form sheets directly on the top of the stringer or floor beam flanges. Fasten sheets securely to form supports, and maintain a minimum bearing length of 1 inch at each end for forms. Place form supports in direct contact with the flange of the stringer or floor beam. Make all attachments for forms by bolts, clips, or other approved means.

For any permanent exposed steel where the galvanized coating has been damaged, thoroughly clean, wire brush, and paint it with two coats of galvanizing compound in accordance with Section 975 to the satisfaction of the Engineer. Do not touch up minor heat discoloration in areas of welds. Locate transverse construction joints at the bottom of a flute, and field drill 1/4 inch weep holes at not less than 12 inches on center along the line of the joints.

400-5.7.5 Placing of Concrete: Vibrate concrete to avoid honeycomb and voids, especially at construction joints, expansions joints, and valleys and ends of form sheets. Use approved pouring sequences. Do not use calcium chloride or any other admixture containing chloride salts in the concrete.

400-5.7.6 Inspection: The Engineer will observe the Contractor's method of construction during all phases of the construction of the bridge deck slab, including the installation of the metal forms; location and fastening of the reinforcement; composition of concrete items; mixing procedures, concrete placement, and vibration; and finishing of the bridge deck. Should the Engineer determine that the procedures used during the placement of the concrete warrant inspection of the underside of the deck, remove at least one section of the forms in each span for this purpose. Do this as soon after placing the concrete as practicable in order to provide visual evidence that the concrete mix and the procedures are obtaining the desired results. Remove an additional section in any span if the Engineer determines that there has been any change in the concrete mix or in the procedures warranting additional inspection.

After the deck concrete has been in place for a minimum period of two days, test for soundness and bonding of the forms by sounding with a hammer as directed by the Engineer. If sounding discloses areas of doubtful soundness to the Engineer, remove the forms from such areas for visual inspection after the concrete has attained adequate strength. Remove permanent bridge deck forms at no expense to the Department.

At locations where sections of the forms have been removed, the Engineer will not require the Contractor to replace the forms. Repair the adjacent forms and supports to

present a neat appearance and to ensure their satisfactory retention. As soon as the form is removed, the Engineer will examine the concrete surfaces for cavities, honeycombing, and other defects. If irregularities are found, and the Engineer determines that these irregularities do not justify rejection of the work, repair the concrete as directed, and provide a General Surface Finish in accordance with 400-15. If the Engineer determines that the concrete where the form is removed is unsatisfactory, remove additional forms as necessary to inspect and repair the slab, and modify the method of construction as required to obtain satisfactory concrete in the slab. Remove and replace all unsatisfactory concrete as directed at no expense to the Department.

If the method of construction and the results of the inspections as outlined above indicate that sound concrete has been obtained throughout the slabs, the amount of sounding and form removal may be reduced when approved.

Provide the facilities for the safe and convenient conduct of the inspection procedures.

400-5.8 Stay-In-Place Concrete Forms:

400-5.8.1 General: Permanent stay-in-place precast reinforced concrete forms may be used in lieu of removable forms to form concrete bridge deck slabs subject to the conditions contained herein.

Precast reinforced concrete stay-in-place forms are not permitted to construct a composite concrete deck. Do not use precast prestressed concrete stay-in-place forms to form any permanent bridge decks.

When detailed plans for structures are dimensioned for the use of removable forms, provide additional slab thickness, elevation changes, changes in design, etc. to accommodate the use of stay-in-place forms, subject to the Engineer's approval. The Engineer will compute pay quantities of the various component members of the structure which are paid on a cubic yard basis from the design dimensions shown on the plans with no allowance for changes in deflection and changes in dimensions necessary to accommodate the stay-in-place forms. The Engineer will limit pay quantities of other Contract items which are increased to accommodate the use of stay-in-place forms to the quantity required for the original plan design.

Prior to using stay-in-place forms, submit for approval detailed plans of the forming system and design calculations. Indicate on the plans the form panel sizes, placing patterns, type of mastic or felt bearing material and type and method of caulking between panels. Also, submit appropriate changes in design details of structural members supporting stay-in-place forms showing any revisions necessary to enable the supporting components to withstand the additional weight of the forms and perform equally as contemplated in the plans. All calculations and details submitted shall be sealed by the Contractor's Engineer of Record. Modify the beams to provide additional strength to compensate for the added dead loads imposed by the use of stay-in-place forms. Obtain this strength by adding additional strands to prestressed girders or increasing the section modulus for steel girders. Do not use stay-in-place forms until the forming system and any necessary design revisions of supporting structural members have been approved by the Engineer. The Department is not responsible for the performance of the stay-in-place forms by its approval.

400-5.8.2 Materials: Construct permanent concrete forms of precast reinforced concrete with a Class 3 Surface Finish. As a minimum, use the same class of concrete and 28-day minimum compressive strength as being used to construct the bridge deck. Use welded steel wire reinforcement meeting the requirements of Section 931.

400-5.8.3 Design: Use the following criteria for the design of permanent bridge deck forms:

- (1) Design the forms on the basis of deadload of form, reinforcement, and plastic concrete plus an unfactored live load of 50 psf for construction loads. Meet the AASHTO design requirements for service loads and ultimate loads as applicable.
 - (2) Deflection under the weight of the forms, reinforcement, and the plastic concrete shall not exceed $1/180$ of the form span or $1/2$ inch, whichever is less. In all cases, do not use a loading that is less than 120 psf total.
 - (3) Use a design span of the form equal to the clear span of the form between supports. Measure the span of concrete forms parallel to the centerline of the form panels.
 - (4) Compute physical design properties of concrete forms in accordance with current AASHTO design procedures.
 - (5) Ensure that all steel reinforcement contained in the cast-in-place concrete has the minimum cover shown on the plans or not less than 1 inch, whichever is greater. Measure the minimum cover normal to the plane of the bottom of the cast-in-place concrete. For stay-in-place concrete forms with other than plane surfaces in contact with the cast-in-place concrete, such as regularly spaced geometrical shapes projecting above the plane of the bottom of the cast-in-place concrete, meet the following special requirements:
 - (a) Space geometrical shapes projecting above the bottom plane of the cast-in-place concrete used to provide support for reinforcement no closer than 3 feet apart and of sufficient height to maintain the required concrete cover on the bottom mat of reinforcing steel.
 - (b) Construct all other geometrical shapes projecting above the plane of the bottom of the cast-in-place concrete to provide a minimum vertical clearance of $3/4$ inch between the closest surface of the projections and the secondary longitudinal reinforcing steel in the deck slab.
 - (c) Do not allow a minimum horizontal distance from the surface of any transverse reinforcing steel to surfaces of the stay-in-place form of less than $1\ 1/2$ inches.
- For all steel reinforcement for the stay-in-place form panels, provide a minimum of 1 inch concrete cover except that, for construction in a salt or other corrosive environment, provide a minimum of $1\ 1/2$ inches concrete cover.
- (6) Maintain the plan dimensions of both layers of primary deck reinforcement from the top surface of the concrete deck. Measure the minimum cover of the bottom mat of steel normal to the top of the precast concrete form panel.
 - (7) Do not consider the permanent bridge deck form as lateral bracing for compression flanges of supporting structural members.
 - (8) Do not use permanent concrete bridge deck forms in panels where longitudinal deck construction joints are located between stringers.

(9) Do not allow the maximum weight of the concrete form to exceed 40 lb/ft^2 of form surface.

400-5.8.4 Construction: Install all forms in accordance with approved fabrication and erection plans.

For concrete forms, provide a minimum bearing length of at least $1\ 1/2$ inches but not exceeding $2\ 1/2$ inches. Support concrete forms on the beams or girders by continuous layers of an approved mastic or felt bearing material that will provide a mortar tight uniform bearing. Use a mastic or felt bearing material that has a minimum width of 1 inch and a

maximum width of 1 1/2 inches. Seal joints between concrete form panels with caulking, tape, or other approved method.

400-5.8.5 Placing of Concrete: Place the concrete in accordance with the requirements of 400-5.7.5. Immediately prior to placing the slab concrete, saturate concrete stay-in-place form panels with water.

400-5.8.6 Inspection: Inspect the concrete in accordance with the requirements of 400-5.7.6. After the deck concrete has been in place for a minimum period of two days, inspect the forms for cracks and excessive form deflection, and test for soundness and bonding of the forms by sounding with a hammer as directed by the Engineer. Remove, for visual inspection, form panels found to be cracked that show evidence of leakage and form panels which have a deflection greater than adjacent panels by 1/2 inch or more which show signs of leakage. If sounding discloses areas of doubtful soundness to the Engineer, remove the form panels from such areas for visual inspection after the concrete has attained adequate strength. Remove permanent bridge deck form panels at no expense to the Department.

At locations where sections of the forms have been removed, the Engineer will not require the forms to be replaced. Repair the adjacent forms and supports to present a neat appearance and to ensure their satisfactory retention. As soon as the form is removed, the Engineer will examine the concrete surfaces for cavities, honeycombing, and other defects. If irregularities are found, and the Engineer determines that these irregularities do not justify rejection of the work, repair the concrete as directed and provide a General Surface Finish in accordance with 400-15. If the concrete where the form is removed is unsatisfactory, as determined by the Engineer, additional forms shall be removed as necessary to inspect and repair the slab, and modify the methods of construction as required to obtain satisfactory concrete in the slab. Remove and replace all unsatisfactory concrete as directed at no expense to the Department.

If the methods of construction and the results of the inspections as outlined above indicate that the Contractor has obtained sound concrete throughout the slabs, the Contractor may moderate the amount of sounding and form removal, when approved.

Provide all facilities for the safe and convenient conduct of the inspection procedures.

400-6 Weep Holes.

Provide weep holes in all abutments, retaining walls, and culverts over 5 feet in height. Provide weep holes that are at least 3 inches in diameter and not more than 10 feet apart, but do not place any weep holes under the area to be occupied by the base or pavement. Place the outlet ends of the weep holes just above the ground line in front of abutments and retaining walls. In culverts, place weep holes approximately 6 inches above the top of the floor slab. Cover the inside ends of all weep holes with wire mesh and at least 2 ft³ of clean, broken stone or gravel, so placed as to allow free drainage but at the same time prevent the fill from washing out. From approximately 6 inches below the bottom of the inside ends of the weep holes, carry a column of clean, broken stone or gravel at least 1 ft² up against the back of the wall to the surface of the original ground.

400-7 Placing Concrete.

400-7.1 Temperature Restrictions:

400-7.1.1 Concreting in Cold Weather: Do not place concrete when the temperature of the concrete at placement is below 45°F.

Meet the air temperature requirements for mixing and placing concrete in cold weather as specified in Section 346. During the curing period, if NOAA predicts the ambient temperature to fall below 35°F for 12 hours or more or to fall below 30°F for more than 4 hours, enclose the structure in such a way that the concrete and air within the enclosure can be kept above 60°F for a period of 3 days after placing the concrete or until the concrete reaches a minimum compressive strength of 1,500 psi.

Assume all risks connected with the placing and curing of concrete. Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Department.

400-7.1.2 Concreting in Hot Weather: Meet the temperature requirements and special measures for mixing and placing concrete in hot weather as specified in Section 346.

When the temperature of the concrete as placed exceeds 75°F, incorporate in the concrete mix a water-reducing retarder or water reducer if allowed by Section 346.

Spray reinforcing steel and metal forms with cool fresh water just prior to placing the concrete in a method approved by the Engineer.

Assume all risks connected with the placing and curing of concrete. Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Department.

400-7.2 Lighting Requirements: Provide adequate lighting for all concrete operations conducted at night. Obtain approval of the lighting system prior to starting the concrete operations.

400-7.3 Inspections before Placing Concrete: Do not place concrete until the depth and character of the foundation and the adequacy of the forms and falsework have been approved by the Engineer. Do not deposit any concrete until all reinforcement is in place and has been inspected and approved by the Engineer.

400-7.4 Exposure to Water: Do not expose concrete other than seal concrete in cofferdams to the action of water before final setting. Do not expose such concrete to the action of salt or brackish water for a period of seven days after placing the concrete. Protect the concrete during this period by keeping salt or brackish water pumped out of cofferdams.

400-7.5 General Requirements for Placing Concrete: Do not place any concrete prior to approval of the Contractors quality control plan in accordance with 6-8. Deposit concrete as nearly as possible in its final position. Do not deposit large quantities at one point and then run or work it along the forms. Take special care to fill each part of the forms, to work coarse aggregate back from the face, and to force concrete under and around reinforcing bars without displacing them.

Use a method and manner of placing concrete that avoids the possibility of segregation or separation of aggregates. If the Engineer determines that the quality of concrete as it reaches its final position is unsatisfactory, remove it and discontinue or adjust the method of placing until the Engineer determines that the quality of the concrete as placed is satisfactory.

Use metal or metal-lined open troughs or chutes with no aluminum parts in contact with the concrete. Where steep slopes are required, use chutes that are equipped with baffles or are in short lengths that reverse the direction of movement. Where placing operations would involve dropping the concrete freely more than 5 feet, deposit it through pipes, troughs, or chutes of sheet metal or other approved material. Use troughs, chutes, or pipes with a combined length of more than 30 feet only with the Department's authorization. Keep all troughs, chutes, and pipes clean and free from coatings of hardened concrete by thoroughly flushing them with water after each run or more often if necessary. Place all foundation concrete against supporting material that is moist at the time of concrete placement. If additional water is required, uniformly apply it ahead of the concrete placement as directed by the Engineer. Do not place concrete on supporting material that is frozen. The Contractor may use a moisture barrier in lieu of controlling the foundation grade moisture when approved by the Engineer.

400-7.6 Placing Concrete by Belt Conveyor: Place concrete by means of a belt conveyor system with written Department authorization. Remove conveyor belt systems which produce unsatisfactory results before continuing operations. Take concrete samples for assurance testing at the discharge end of the belt conveyor system. Make available to the Engineer the necessary platform to provide a safe and suitable place for sampling and testing. Remove any concrete placed in an unsatisfactory manner at no expense to the Department before continuing operations.

Use conveyor belt systems that do not exceed a total length of 550 feet, measured from end to end of the total assembly. Arrange the belt assembly so that each section discharges into a vertical hopper arrangement to the next section. To keep segregation to a minimum, situate scrapers over the hopper of each section to remove mortar adhering to the belt and to deposit it into the hopper. Equip the discharge end of the conveyor belt system with a hopper and a chute or suitable deflectors to cause the concrete to drop vertically to the deposit area.

In order to avoid delays due to breakdowns, provide stand-by equipment with an alternate power source prior to the beginning of the placement.

After the beginning of the placement, direct the discharge from the belt conveyor so that the concrete always falls on freshly placed concrete.

400-7.7 Placing Concrete by Pumping: In general, use concrete pumping equipment that is suitable in kind and adequate in capacity for the work proposed. Use a pump discharge line that has a minimum diameter of 4 inches. Use a pump and discharge lines that are constructed so that no aluminum surfaces are in contact with the concrete being pumped. Operate the pump to produce a continuous stream of concrete, without air pockets. When using cement slurry or similar material to lubricate the discharge line when pumping begins, collect such material at the point of discharge. Dispose of the collected slurry in areas provided by the Contractor. Control the pump discharge locations so that the placement locations of the various lots of concrete represented by strength test cylinders can be identified in the event the test cylinders indicate deficient strength. When concrete is placed by pumping, take all test samples of concrete at the end of the discharge line, except in accordance with the provisions of Section 346.

400-7.8 Consolidation: Consolidate the concrete by continuous working with a suitable tool in an acceptable manner, or by vibrating as set forth in 400-7.11. When not using vibrators, thoroughly work and compact all thin-section work with a steel slicing rod. Spade all faces, and flush the mortar to the surface by continuously working with a concrete spading implement.

400-7.9 Obstructions: In cases where, because of obstructions, difficulty is encountered in puddling the concrete adjacent to the forms, bring the mortar content of the mix into contact with the interior surfaces by vibrating the forms. Produce the vibrations by striking the outside surfaces of the forms with wooden mallets or by other satisfactory means. In placing concrete around steel shapes place it only on one side of the shape until it flushes up over the bottom flange of the shape on the opposite side, after which place it on both sides to completion. After the concrete has taken its initial set, exercise care to avoid jarring the forms or placing any strain on the ends of projecting reinforcing bars.

400-7.10 Requirements for Successive Layers: Generally, place concrete in continuous horizontal layers, approximately 12 inches thick. To avoid obtaining a plane of separation between batches, do not allow the time before placing the next successive layer to exceed 20 minutes, unless the Engineer determines that adequate fluidity exists in the underlying layer. Generally, leave each layer of concrete unfinished to secure efficient bonding with the overlying layer. To minimize the visibility of joints on exposed faces, finish the top surface of the concrete immediately adjacent to the forms of the exposed face, smoothing with a plaster mason's trowel. Where required, use inset form work to eliminate featheredges and to obtain concrete layers with a minimum thickness of 6 inches. Conduct the operation of depositing and consolidating the concrete so as to form a dense, impervious mass of uniform texture with smooth faces on exposed surfaces. Remove, dispose of, and replace defective concrete as directed by the Engineer and at no expense to the Department.

400-7.11 Vibration of Concrete:

400-7.11.1 General: Consolidate all concrete except seal, steel pile jackets, and concrete for incidental construction by the use of mechanical vibrators.

400-7.11.2 Vibrators: Provide adequate vibrators on the project that are approved by the Engineer before beginning concrete work. Generally, provide vibrators of the internal type. For thin sections, where the forms are especially designed to resist vibration, the Contractor may use external vibrators. Use a vibrator with a minimum frequency of 4,500 impulses per minute with sufficient intensity and duration to cause complete consolidation of the concrete without causing segregation of the materials. For vibrating thin, heavily reinforced sections, use heads of such size to secure proper vibration of the concrete without disturbance of either the reinforcing steel or the forms.

400-7.11.3 Number of Vibrators Required: Use a sufficient number of vibrators to secure the compaction of each batch before the next batch is delivered, without delaying the delivery. In order to avoid delays due to breakdowns, provide at least one stand-by vibrator, with an appropriate power source.

400-7.11.4 Method of Vibration: Use vibrators to consolidate properly placed concrete. Do not use them to move concrete about in the forms. Insert the vibrators in the surface of concrete at points spaced to ensure uniform vibration of the entire mass of the concrete. Insert the vibrator at points that are no further apart than the radius over which the vibrator is visibly effective. Allow the vibrator to sink into the concrete by its own weight, and allow it to penetrate into the underlying layer sufficiently so that the two layers are thoroughly consolidated together. After thoroughly consolidating the concrete, withdraw the vibrator slowly to avoid formation of holes.

400-7.11.5 Hand Spading: When necessary in order to secure well-filled forms, free from aggregate pockets, honeycomb, bubbles, etc., spade the concrete by hand, along the surfaces of the forms and in all corners, following the vibration.

400-7.12 Columns: Place concrete in columns in one continuous operation for each lift as shown in the plans.

400-7.13 Slabs and Bridge Decks:

400-7.13.1 Bulkheads, Screed Rails, and Screeding Devices: Strike-off the concrete using an approved metal screed operating on rails or bulkheads. Use devices which do not contain aluminum parts. Prior to placing concrete, provide an approved screed capable of striking-off and screeding the surface of the slab or deck to the required shape. Set all necessary bulkheads and screed rails to the required grade. Use bulkheads, screed rails, and screeding devices that permit vertical profile adjustment to the grade, satisfactory for providing straight transverse slopes, differing transverse slopes broken as shown in the plans and/or transverse slopes with changing grade along the longitudinal length of slab or deck. Locate the screed rails so the entire placement surface can be screeded to grade without using intermediate screed rails, unless approved otherwise by the Engineer. Use a screed consisting of a truss or heavy beams that will retain its shape under all working conditions, and a set of rotating drums with a diameter sufficient to carry a 2 inch mortar roll in front of and parallel to the axis of the drums, while making an initial pass. Adjust the drums to prevent mortar buildup forming behind the trailing edges of the drums. For long bridges, as defined in 400-15.2.5.1, provide a device that automatically smooths the concrete surface to an untextured finish and that is attached to, and is moved by, the rolling drum screed. As an alternate to the drum type screed, a mechanical screed with a metal strike-off may be used. Equip the mechanical screed with mechanical vibrators to provide continuous uniform vibration to the entire length unless otherwise authorized by the Engineer. Small and irregularly shaped areas that cannot be mechanically screeded may be screeded in a manner approved by the Engineer.

400-7.13.2 Screed Demonstration: Subsequent to the placement of all reinforcing steel and prior to placing any slab or deck concrete, demonstrate that the proposed equipment and methods can finish the concrete to the specified grades while maintaining the specified cover over the reinforcement. Provide the demonstration over the entire length and width of the spans to be placed. During the demonstration, load the screed support rails that are cantilevered beyond the fascia girders to simulate the concrete loading that will be placed on the rail support system during actual placement and screeding operations.

400-7.13.3 Screeding Operations: Perform concrete placement and screeding as independently controlled mechanical operations. Ensure that the passing of the screed and forward movement of the screeding equipment are independent of the movement of concrete placement equipment. Level the concrete in front of the screed as near to the finished grade as possible to prevent the screed from rising off the rail and forming uneven ridges behind the screed. Pass the screed over the slab or deck as many times as necessary to obtain a satisfactory surface and provide a concrete surface true to grade and crown, and free of irregularities.

Do not add water to the concrete surface to assist in finishing operations unless specifically authorized by the Engineer. If the Engineer permits the addition of water, apply only a fog mist, above the concrete surface, by means of approved power driven spray equipment.

For long bridges, as defined in 400-15.2.5.1, do not manually or mechanically float the concrete surface or apply a texture by broom or any other device to the

concrete surface produced by the screeding process. Correct isolated surface irregularities in accordance with 400-15.2.5.3.

400-7.13.4 Placing Operations: Select an approved concrete design mix which ensures complete placement of all slab or deck concrete between construction joints before initial set begins in the plastic concrete. On placements of 50 yd³ or less, the minimum placement rate is 20 yd³/h. On placements of greater than 50 yd³, the minimum placement rate is 30 yd³/h.

The Engineer will not permit slab or deck placements until an acceptable plan for meeting the minimum placement rate is approved.

400-7.13.5 Concrete Decks on Steel Spans: Where concrete decks are placed on steel spans, release the temporary supports under the bridge before placing any concrete.

400-7.13.6 Concrete Decks on T-Beams: For cast-in-place T-beam construction, cast the slabs and beams in one continuous operation. As an exception, where special shear anchorage or keys are provided for in the plans or approved by the Engineer, the beams and slabs may be constructed in successive placements.

400-7.13.7 Diaphragms: Place concrete diaphragms at least 48 hours before the bridge deck slabs are placed unless otherwise indicated in the plans.

400-7.13.8 Weather Protection: Provide an approved means of protecting unhardened concrete from rain. Position the protection system to shield the concrete from rain and running water. Provide a shield impervious to water over the slab or deck concrete, of sufficient size to protect all areas of slab or deck concrete subject to water damage, and include a means of intercepting and diverting water away from freshly placed concrete. Arrange the equipment so that the weather protection system can be erected over unhardened concrete. When there is a possibility of rain during concrete placement operations, place the weather protection system in stand-by readiness, capable of being deployed in a timely manner. Use the weather protection immediately when rain begins so that slab or deck concrete damage will not occur. Do not place concrete during rain.

Assume responsibility for damage to the slab or deck in the case of failure of the weather protection system.

Describe the weather protection materials and methods in the Contractor's quality control plan.

400-7.14 Concrete Box Culverts: In general, place the base slab or footing of concrete box culverts, and allow them to set before constructing the remainder of the culvert. In this case, make suitable provision for longitudinal keys. Construct bottom slabs, footings, and apron walls as a monolith if practicable. Where transverse construction joints are necessary, place them at right angles to the culvert barrel, and make suitable provision for keys.

In the construction of box culverts having walls 6 feet or less in height, the sidewalls and top slab may be constructed as a monolith or may place the concrete in the walls and allow it to set before placing the top slab concrete.

Where the height of the box culvert walls exceed 6 feet, place the walls, and allow the concrete to set at least 12 hours before placing the top slab concrete. In such cases, form keys in the sidewalls.

When casting the walls and top slabs of box culverts as a monolith, ensure that any necessary construction joints are vertical. Design all construction joints with formed keys. Provide keys that are beveled as shown in the plans or as directed, but do not allow the edge of the beveled material forming the key to be less than 1 1/2 inches from the edge of the concrete.

Construct each wingwall, if possible, as a monolith. Ensure that construction joints, where unavoidable, are horizontal and so located that no joints will be visible in the exposed face of the wing above the ground line.

Precast box culvert sections may be used in lieu of cast-in-place box culvert construction provided the provisions in Section 410 are satisfied.

400-8 Seals.

400-8.1 General: Wherever practicable, dewater all foundation excavations, and deposit the concrete in the dry as defined in 455-15.2. Where conditions are encountered which render it impracticable to dewater the foundation before placing concrete, the Engineer may authorize the construction of a concrete foundation seal of the required size. Then, dewater the foundation, and place the balance of the concrete in the dry.

When required to place seal concrete, the Contractor is responsible for the satisfactory performance of the seal in providing a watertight excavation for placing structural concrete. The Department will provide and pay for the seal concrete as an aid to the construction of the structure. Repair seal concrete as necessary to perform its required function at no expense to the Department.

400-8.2 Method of Placing: Carefully place concrete deposited under water in the space in which it is to remain by means of a tremie, a closed-bottom dump bucket of not less than 1 yd³ capacity, or other approved method. Do not disturb the concrete after depositing it. Deposit all seal concrete in one continuous placement. Do not place any concrete in running water, and ensure that all form work designed to retain concrete under water is watertight.

400-8.3 Use of Tremie: Use a tremie consisting of a tube having a minimum inside diameter of 10 inches, constructed in sections having water-tight joints. Do not allow any aluminum parts to have contact with the concrete. Ensure that the discharge end is entirely seated at all times, and keep the tremie tube full to the bottom of the hopper. When dumping a batch into the hopper, keep the tremie slightly raised (but not out of the concrete at the bottom) until the batch discharges to the bottom of the hopper. Stop the flow by lowering the tremie. Support the tremie such as to permit the free movement of the discharge end over the entire top surface of the work and to permit its being lowered rapidly when necessary to choke off or retard the flow. Provide a continuous, uninterrupted flow until completing the work. Exercise special care to maintain still water at the point of deposit.

400-8.4 Time of Beginning Pumping: Do not commence pumping to dewater a sealed cofferdam until the seal has set sufficiently to withstand the hydrostatic pressure, and in no case earlier than 72 hours after placement of the concrete.

400-9 Construction Joints.

400-9.1 Location: Make construction joints only at locations shown in the plans or in the placement schedule, unless otherwise approved in writing. If not detailed in the plans or placement schedule, or in case of emergency, place construction joints as directed.

400-9.2 Provisions for Bond and Transmission of Shear: Use shear key reinforcement where necessary to transmit shear or to bond the two sections together.

400-9.3 Preparations of Surfaces: Before depositing new concrete on or against concrete which has hardened, re-tighten the forms. Roughen the surface of the hardened concrete in a manner that will not leave loosened particles, aggregate, or damaged concrete at the surface. Thoroughly clean the surface of foreign matter and laitance, and saturate it with water.

400-9.4 Placing Concrete: Continuously place concrete from joint to joint. Carefully finish the face edges of all joints which are exposed to view true to line and elevation.

400-9.5 Joints in Sea Water or Brackish Water: For concrete placed in sea water or brackish water, do not place any construction joints between points 2 feet below extreme low tide and 4 feet above extreme high tide.

400-9.6 Joints in Long Box Culverts: For long concrete box culverts, vertical construction joints may be placed at a spacing not less than 30 feet. When using transverse construction joints, ensure that longitudinal reinforcing steel is continuous through the joint and that the joint is vertical.

400-9.7 Crack Control Grooves in Concrete Bridge Decks: When the plans require crack control grooves in the top surface of decks, either install a tooled "V" groove prior to initial concrete set or saw a groove using an early entry dry cut saw. When using an early entry dry cut saw, operate in accordance with the manufacturer's recommendations. Commence sawing as soon as the concrete has hardened enough to permit standing on the surface without leaving visible tracks or impressions and before uncontrolled concrete cracks occur.

400-10 Expansion Joints.

400-10.1 General: After meeting the smoothness criteria in 400-15, construct expansion joints to permit absolute freedom of movement. Carefully remove all loose or thin shells of mortar likely to cause a spall with movement at a joint from all expansion joints as soon as possible.

400-10.2 Sealed Joints: Fill expansion joints with a preformed joint filler. Cut the filler to conform to the cross-section of the structure, and furnish it in as few pieces as practicable, using only a single piece in each curb section. Do not use small pieces that would tend to come loose. Prepare joints to be sealed and apply the sealer in accordance with approved manufacturer's directions.

400-10.3 Joint System Installation: Install expansion joints before or after the deck planing required by 400-15.2.5.5 following the manufacturers instructions. When installed after deck planing, install the edge rail assemblies in the blockouts on a profile tangent between the ends of the deck and/or approach slab to within a +0 and -1/4 inch variation.

When installed before deck planing, install the edge rail assemblies 3/8 inch, $\pm 1/16$ inch, below the top surface of the deck or approach slab to compensate for concrete removal during planing.

400-11 Contact and Bearing Surfaces.

400-11.1 Separation of Surfaces: In general, separate all contact surfaces between superstructure and substructure or end walls and between adjacent superstructure sections by a layer of 55 lb roofing felt.

400-11.2 Finishing of Bearing Surfaces: Construct bearings surfaces (areas) to the tolerances as specified herein and in the other parts of the Contract Documents. When using neoprene bearing pads, finish the concrete surface to a uniform 'rough' texture using a burlap drag, fine bristle broom or float. For metal or high load rotational bearings, fill minor depressions, 1/8 inch maximum, caused by finishing, bush hammering, or grinding with a low-viscosity epoxy meeting the requirements of 926-1, Type F-2, applied by the use of a squeegee. Bearing surfaces may be ground to final position with carborundum. Check all bearing surfaces with a metallic straightedge prior to setting bearings or neoprene pads.

400-11.2.1 Deviation from Specified Elevations for Steel Beam Superstructures: Construct to the elevation shown on the plans plus or minus 0.01 feet and do not exceed a 0.01 feet difference between specified elevations of bearing areas of adjacent bearings measured between the centerlines of bearing areas.

400-11.2.2 Deviation from Specified Elevations for Concrete Beam Superstructures: Construct to the elevation shown on the plans plus or minus 0.02 feet.

400-11.2.3 Projecting Irregularities: Projecting irregularities will not exceed 1/16 inch.

400-11.2.4 Variations in Flatness for Neoprene Pads: In any direction, the pad is to be flat to within 1/16 inch. Pads designated to be sloped are not to deviate from the theoretical slope by the same amount.

400-11.2.5 Variations in Flatness for Metal or High Load Rotational Bearings: Construct the bearing area to the tolerance indicated for the measured length along the orthogonal axes.

Bearing area length up to 30 inches long to plus or minus 1/16 inch.

Bearing area length over 30 inches up to 45 inches long to plus or minus 3/32 inch.

Bearing area length over 45 inches long to plus or minus 1/8 inch.

400-11.3 Beam and Deck Slab Units: Do not allow the bearing plate or bearing area plane of precast concrete beam and deck slab units, including prestressed units, to deviate from a true plane by more than 1/8 inch when both bearing areas of a unit are tested on a level plane. Provide a bearing plate or bearing area that also proves to be a true plane when tested in all directions of the plane surface with a steel straightedge. In the event that a 100% true plane is not achieved, the Engineer will accept a surface having not less than 80% of its area in a true plane provided the deviations from such true plane are evenly distributed. Remove minor convex projections by grinding with an abrasive stone. The Engineer will accept minor depressions, provided that they amount to not more than 20% of the bearing area, are evenly distributed over the entire bearing area, and are not deeper than 1/8 inch.

400-11.4 Bearing Pads: Use bearing pads for seating bridge shoes, ends of beams, and slabs of the types specified or required in the plans.

Furnish and install Composite Neoprene Pads as detailed in the plans. Place neoprene pads, where specified or required, directly on masonry surfaces finished in accordance with the requirements of this Article. Ensure that pads, bearing areas of bridge seats, and metal bearing plates are thoroughly cleaned and free from oil, grease, and other foreign materials.

Exercise care in fabrication of related metal parts to avoid producing conditions detrimental to the performance of the pads, such as uneven bearing, excessive bulging, etc.

400-12 Anchor Bolts and Dowels.

Set anchor bolts and dowels as specified in Section 460.

Galvanize all anchor bolts as specified in Section 962.

400-13 Epoxy Bonding Compounds.

Where epoxy bonding compounds for bonding concrete are specified or required, apply the epoxy bonding materials only to clean, dry, structurally sound concrete surfaces. Provide surface preparation, application, and curing of epoxy bonding compound in strict accordance

with the manufacturer's recommendations for each particular application. Use an epoxy bonding compound listed on the Department's Qualified Products List.

400-14 Removal of Forms.

Use the table below as the criterion for minimum time or compressive strength required before removal of forms or supports.

When using the time period criterion, include in the time period all days except days in which the temperature falls below 40°F.

Use the specified 28-day minimum compressive strength value as stated in 346-3.1 for each Class of Concrete utilized. Location of Concrete Placement	Minimum Time for Form Removal for any Strength Concrete	Minimum (%) of 28-day Compressive Strength for Form Removal
(1) Deck slabs, top slabs of culverts and bottom of caps, forms under sidewalks, and safety curb overhangs extending more than 2 feet		
(a) Class II (Bridge Deck)	7 days*	75*
(b) Class II (Other than Bridge Deck)	7 days	75
(c) Class III	7 days	70
(d) Class IV	7 days	60
(e) Class V	7 days	50
(2) Walls, piers, columns, sides of beams and other vertical surfaces	24 hours**	50**
(3) Front face form of curbs	6 hours	70
* Reference 400-16.4		
**Do not place additional load on the section until 70% of the specified 28-day concrete strength is attained. Also, refer to 400-7.4.		

700 HIGHWAY SIGNING.

(REV 6-29-09) (FA 7-1-09) (1-10)

SECTION 700 (Pages 779-786) is deleted and the following substituted:

SECTION 700 HIGHWAY SIGNING

700-1 Description.

Furnish and erect aluminum roadway signs, with supporting posts or columns, at the locations shown in the plans, in accordance with the details shown in the plans. All overhead cantilever and truss mounted signs are to be lighted unless otherwise noted in the plans. Signs shall be retroreflective unless otherwise specified.

The City designates Ground Traffic Signs as all signs erected on the shoulders, slopes, or medians, but not extending over the traveled roadway.

The City designates signs erected partially or completely over the traveled roadway or mounted on bridges as Overhead Traffic Signs, and may further classify some of these signs as Overhead Cantilever Traffic Signs.

700-2 Sign Assembly Design Requirements.

700-2.1 General: Sign assemblies as specified in the plans fall into two general categories: ground sign assemblies, and overhead sign assemblies.

700-2.2 Sign Panels: All sign panels shall be aluminum. Fabricate standard sign panel messages in accordance with details included in the Standard Highway Signs Manual published by the U.S. Department of Transportation. The Engineer will not require the submittal of shop drawings for these signs or for non-standard sign panels and messages fabricated in accordance with details shown in the plans. Submit seven copies of shop drawings indicating detailed layout of the sign legend, spacing, and border for all other signs to the Engineer prior to fabrication.

If the size of a sign is not specified in the plans, provide the size sign for conventional roadways as shown in the MUTCD.

700-2.3 Breakaway Support Mechanisms:

700-2.3.1 Frangible Supports: Provide posts for all frangible sign assemblies consisting of aluminum tubes up to 3 1/2 inches outside diameter with 3/16 inch wall thickness. Alternatives to the round aluminum tubes shall meet the requirements of NCHRP 350, Structures Manual for wind load requirements and be listed on the Qualified Products List (QPL).

700-2.3.2 Slip Bases: For posts with slip base assemblies, use galvanized steel in accordance with the requirements in the Design Standards. Alternative slip plane, plastic hinge, fracture elements, or combination sign support systems meeting the requirements of NCHRP 350 and Structures Manual wind load requirements may be used, subject to approval by The City and listing on QPL. The QPL shall classify these systems as directional or omni-directional systems.

700-2.4 Overhead Sign Structures:

700-2.4.1 Department's Design: When the overhead sign structure is detailed in the plans, submit shop drawings to The City for approval as specified in Section 5. Prior to the submittal of the shop drawings, determine the actual length of support columns for all sign

structures on the basis of existing field conditions and include these lengths on the shop drawings.

700-2.4.2 Contractor's Design: When the overhead sign structure is not detailed in the plans, submit to The City a foundation design and a sign structure design utilizing steel structural members. Meet the requirements of this Section and the FDOT Structures Manual.

Have designs and shop drawings prepared by a Specialty Engineer or the Contractor's Engineer of Record, and submit them to The City for review and approval in accordance with Section 5.

Determine the actual length of support columns for all sign structures on the basis of existing field conditions, and include these lengths in the shop drawings and calculations.

700-2.4.3 Installation: Install nuts on anchor bolts in accordance with 649-5 and 649-6. Use ASTM A325 bolt, nut and washer assemblies for all installations other than anchor bolts as follows. Use bolt, nut and washer assemblies that are free of rust and corrosion and that are lubricated properly as demonstrated by being able to easily hand turn the nut on the bolt thread for its entire length. Tighten nuts to the full effort of an ironworker using an ordinary spud wrench to bring the faying surfaces of the assembly into full contact which is referred to as snug tight condition. After bringing the faying surfaces of the assembly into full contact and to a snug tight condition, tighten nuts to achieve the minimum torque as specified in Table 700-1 unless the connection is an alternate splice connection of a span sign structure, in which case, tighten nuts in accordance with the turn-of-nut method of Table 460-7 of Section 460. Maintain uniform contact pressure on the faying surfaces during snugging and the subsequent final tightening process, by using a bolt tightening pattern that balances the clamping force of each bolt, as closely as possible, with the equal clamping force of a companion bolt. Within 24 hours after final tightening, the Engineer will witness a check of the minimum torque using a calibrated torque wrench for 3 bolts or a minimum of 10% of the bolts, whichever is greater, for each connection; however, do not perform this check on alternate splice connections of span sign structures.

Table 700-1	
Bolt Diameter (in.)	Minimum Torque (ft.-lbs.)
3/8	15
1/2	37
5/8	74
3/4	120
7/8	190
1	275
1 1/8	375
1 1/4	525

700-2.5 Sign Retroreflective Sheeting: Meet the requirements of Section 994. Use Type III, IV, V or VII sheeting for background sheeting, white legends, borders and shields on all signs, excluding STOP, DO NOT ENTER, and WRONG WAY. Use Type VII sheeting for STOP, DO NOT ENTER and WRONG WAY signs. Use Type III, IV, V or VII yellow-green fluorescent sheeting for S1-1 school advance signs and supplemental panels used with S1-1, S3-1

and S4-5 school signs. Do not mix signs having fluorescent yellow-green sheeting with signs having yellow retroreflective sheeting.

Use fluorescent orange Type VI or VII for all orange work zone signs.

Mesh signs shall meet the color, daytime luminance and nonreflective property requirements of Section 994, Type VI.

700-3 Materials.

700-3.1 General: Meet the materials requirements shown below and any additional requirements which the plans might show.

700-3.2 Concrete: Use concrete meeting the requirements of Section 346.

700-3.3 Reinforcing Steel: For reinforcing steel in footings, meet the requirements of Section 415.

700-3.4 Aluminum Materials:

700-3.4.1 General: For aluminum materials, meet the general provisions of 965-1.

700-3.4.2 Sheets and Plates: For aluminum sheets and plates for sign panels, meet the requirements of ASTM B 209, Aluminum Association Alloy 6061-T6, 5154-H38 or 5052-H38 and those shown in the plans.

700-3.4.3 Extruded Tubing: For extruded aluminum tubing, meet the requirements shown in the plans.

700-3.4.4 Castings: Provide aluminum castings of the alloys shown in the plans. For aluminum alternates the Engineer will allow a cast base, provided the Contractor submits test reports giving evidence that the base to be used for each pole size is as strong as the pole with which it is to be used. Perform physical tests and submit certified reports for one base to be used with each pole size. Use Alloy A 356-T6 for the castings. Use aluminum bolts for connecting parts of the cast base.

700-3.4.5 Channels: For aluminum channels, meet the requirements of ASTM B 308 for the alloys shown in the plans.

700-3.4.6 Bolts, Nuts, and Lockwashers: For aluminum bolts, nuts, and lockwashers, meet the requirements shown in the plans. Ensure that finished bolts and washers are given an anodic coating of at least 0.0002 inch in thickness and are chromate-sealed.

700-3.5 Steel:

700-3.5.1 General: Only use structural steel, including bolts, nuts, and washers, that have been hot dip galvanized or metalized after fabrication. Perform hot dip galvanizing in accordance with ASTM A 123 or ASTM A 153 and metalizing in accordance with Section 562. For galvanized steel members meet the general requirements of Section 962 and the specific requirements of 962-9.

700-3.5.2 Specific Uses of Aluminum and Galvanized Steel: Use aluminum bolts, nuts, and hardware to connect parts of the cast base.

Use galvanized steel anchor bolts for anchoring base plates to concrete bases and for the nuts and washers.

For all other metal parts of the cast base, the Engineer will allow galvanized steel as an alternate to aluminum.

700-3.6 Bearing Pads: For bearing pads, meet the requirements of 932-2.

700-3.7 Retroreflective Sheeting: All retroreflective sheeting must be listed on the QPL and meet the retroreflective sheeting requirements of Section 994.

700-3.8 Process Colors: Use transparent and black opaque process colors listed on the QPL meeting the requirements of 994-4 on retroreflective and nonreflective sheeting.

700-4 Preparation of Sign Blanks.

700-4.1 De-greasing and Etching for Aluminum Sign Blanks:

700-4.1.1 General: Prior to the application of retroreflective sheeting, use any of the methods shown below to de-grease and etch the aluminum sign blanks.

700-4.1.2 Hand Method: Under this method, de-grease and etch the blanks in one operation, using steel wool (medium grade) with any of the following combinations of materials:

- (1) An abrasive cleanser of a commercial grade kitchen scouring powder.
- (2) Acid and a suitable detergent solution.
- (3) An alkaline solution.

Thoroughly rinse the blanks with clean water following all hand de-greasing operations.

700-4.1.3 Power-Washer Method: Under this method, de-grease the blanks with an inhibited alkaline cleanser, by spraying for 90 seconds with the solution between 135 and 249°F, the exact temperature to be as recommended by the manufacturer of the cleanser. After the spraying, rinse the blanks with clean water. Then etch the blanks by immersing them in a 6 to 8% solution of phosphoric acid at a temperature of 100 to 180°F for 60 seconds. After immersion, rinse the blanks in clean water.

700-4.1.4 Immersion Method: Under this method, de-grease the blanks by immersing them in a solution of inhibited alkaline cleanser at a temperature between 160 and 180°F for three to five minutes, and then rinsing with clean water. Then etch blanks by immersing them in a 6 to 8% solution of phosphoric acid at a temperature of 100°F for three minutes. After immersion, rinse the blanks in clean water.

700-4.1.5 Vapor De-greasing Method: Under this method, de-grease the blanks by totally immersing them in a saturated vapor of trichloroethylene. Remove trademark printing with lacquer thinner or a controlled alkaline cleaning system.

700-4.1.6 Alkaline De-greasing Method: De-grease the blanks by totally immersing them in a tank containing an alkaline solution, controlled and titrated in accordance with the solution manufacturer's directions. Adapt immersion time to the amount of soil present and the thickness of the metal. After immersion, thoroughly rinse the blanks with running water.

700-4.1.7 Etching Method when De-greasing is Separate Operation: If using either of the de-greasing methods described under 700-4.1.5 and 700-4.1.6, accomplish etching by one of the following alternate methods:

(1) Acid Etch: Etch well in a 6 to 8% phosphoric acid solution at 100°F, or in a proprietary acid etching solution. Rinse thoroughly with running cold water, which may be followed by a hot water rinse.

(2) Alkaline Etch: Etch aluminum surfaces in an alkaline etching material that is controlled by titration. Meet the time, temperature, and concentration requirements specified by the solution manufacturer. After completing etching is complete, rinse the panel thoroughly.

700-4.2 Drying: Dry the panels using a forced-air drier. Use a device or clean canvas gloves, to handle the material between all cleaning and etching operations and the application of retroreflective sheeting. Do not allow the metal to come in contact with greases, oils or other contaminants prior to the application of retroreflective sheeting.

700-4.3 Fabrication of Sign Blanks: Fabricate all metal parts to ensure a proper fit of all sign components. Complete all fabrication, with the exception of cutting and punching of holes, prior to metal de-greasing and applying the retroreflective sheeting. Cut metal panels to size and shape and keep free of buckles, warp, dents, burrs, and defects resulting from fabrication. Provide all sign panels with a flat surface.

700-5 Fabrication of Retroreflectorized Sign Faces.

700-5.1 Application of Sheeting: Apply retroreflective sheeting to the base panels with mechanical equipment in a manner specified for the manufacture of traffic control signs by the sheeting manufacturer. Ensure that sheeting applied to extruded aluminum sections adheres over and around the side legs of all panels to a minimum distance of 1/16 inch beyond the radius of top edge.

Match sign faces comprising two or more pieces of retroreflective sheeting for color and retroreflectivity at the time of sign fabrication. Reverse and apply consecutively alternate successive width sections of either sheeting or panels to ensure that corresponding edges of sheeting lie adjacent on the finished sign. The Engineer will not accept nonconformance that may result in non-uniform shading and an undesirable contrast between adjacent widths of applied sheeting.

700-5.2 Finish: Seal retroreflective sheeting splices and sign edges with materials the sheeting manufacturer supplies in a manner the sheeting manufacturer specifies for traffic control signs.

700-5.3 Screening-on Message: Screen message and borders on retroreflective sheeting in accordance with the recommendations of the ink or overlay manufacturer. Process either before or after applying the sheeting to the base panels.

700-5.4 Finished Sign Face: Provide finished signs with clean cut and sharp messages and borders. Ensure that finished background panels are essentially a plane surface.

700-5.5 Stenciling: For permanent roadway signs, mark the back of all finished panels at the bottom edge with "FDOT", the date of fabrication, the date of installation, and the fabricator's initials. Make the markings unobtrusive, but legible enough to be easily read by an observer on the ground when the sign is in its final position. Apply the markings in a manner that is at least as durable as the sign face.

700-6 Acceptance of Signs.

700-6.1 Manufacturer's Certification and Recommendations: Ensure that the sign manufacturer certifies that the delivered signs conform to this Section and provides recommendations for storing and repairing signs.

700-6.2 Packaging and Shipping: Have the manufacturer package and ship the signs in a manner which will minimize possible damage.

700-6.3 Storage of Signs: If signs are stored prior to installation, store them in accordance with the manufacturer's recommendations.

700-6.4 Sign Inspection: Do not install signs until the Engineer inspects them for conformance with this Section. Provide all manufacturer certifications and recommendations prior to the Engineer's inspection. The Engineer will inspect the signs upon delivery to the storage or project site and again at the final construction inspection. Repair and replace signs deemed unacceptable by the Engineer at no expense to The City.

700-6.5 Imperfections and Repairs: Repair and replace signs containing imperfections or damage regardless of the kind, type, or cause of the imperfections or damage. Make repairs

according to the manufacturer's recommendations and to the satisfaction of the Engineer. Ensure that completed repairs provide a level of quality necessary to maintain the service life warranty of the sign and are satisfactory in appearance to the Engineer.

700-7 Foundations.

700-7.1 Footings:

700-7.1.1 Excavation and Backfilling: Perform excavation and backfilling for the footings in accordance with Section 125, with the exceptions that no specific density is required and that the backfill may be tamped in 4 inches maximum layers. Use material that is at near optimum moisture and neither dry or saturated, and tamp to the extent directed by the Engineer. The City may require that the backfilling be done with poured concrete.

Install spread footings which support sign structures overhanging the roadway as required in 455-25 through 455-37.

700-7.1.2 Mixing and Placing Concrete: For batching and mixing of concrete for footings, meet the requirements of Section 346, except that the Engineer will allow hand mixing by approved methods where the quantity to be mixed does not exceed $1/2 \text{ yd}^3$. Use cast-in-place or precast concrete for the footings. Obtain precast concrete footings from a plant that is currently on the list of Producers with Accepted Quality Control Programs. Producers seeking inclusion on the list shall meet the requirements of 105-3.

700-7.1.3 Forms: The Engineer will not require forms when the ground is sufficiently firm, in which case, sufficiently moisten the adjacent earth to prevent it from absorbing the moisture from the concrete. Where forms are required and the soil is not moist, place sufficient water, as directed by the Engineer, in the hole, and pour the concrete as soon as the water has been absorbed. Place at least 4 inches of loose earth, free from clods or gravel, over the top of the footing to effect curing.

700-7.1.4 Finishing Concrete: Trowel the top of the concrete to a smooth finish.

700-7.2 Drilled Shafts: Meet the requirements of Section 455.

700-8 Erection of Signs and Sign Supports.

Do not erect overhead sign supports until the concrete strength in the support footing is at least 2,500 psi. Determine concrete strength from tests on a minimum of two test cylinders sampled and tested in accordance with ASTM C 31 and ASTM C 39 and verifying test results have been provided to the Engineer.

Erect the signs and sign structures in accordance with the details shown in the plans. The Contractor may fabricate the structural steel sign trusses in sections that will fit into available galvanizing vats. Prior to galvanizing, weld the joints as specified in 460-6 and in accordance with the details shown in the plans. Re-galvanize damaged parts as specified in Section 562.

Weld aluminum structures in accordance with 965-3.

700-9 Removal or Relocation of Signs.

Relocation of signs shall consist of removing the existing sign assembly and installing the sign on a new foundation.

When the plans call for existing ground-mounted signs to be relocated or removed, immediately remove supports and footings that project more than 6 inches above the ground surface after removing the sign panel from the assembly. Remove existing footings to a depth at least 12 inches below the ground surface. The costs will be included in the Contract unit price of the item to which it is incidental.

700-10 Overlay Existing Sign Panels.

Use 0.040-inch thick aluminum sheeting for overlays larger than 3 square feet placed on a sign panel. Replace hex head bolts on the sign surface using stainless steel flat head machine screws with nuts and lock washers to give a flat surface for the overlay panel. Install the overlay panels starting at the edge away from traffic. Place each panel against the sign using a clamp at the top to hold the panel in place. Drill 1/8-inch holes 1-inch inside the panel edge every 6-inches to 8-inches and install 1/4-inch to 3/8-inch length pop rivets. Install additional rivets along the outer edge 6-inches to 8-inches. Place the remaining panels using the same procedure with the overlap in the direction away from the traffic and with rivets along the overlap on 12-inch centers.

700- 11 Method of Measurement.

The quantities to be paid for will be:

- (1) The number of ground traffic signs of each designated class of assembly, complete.
- (2) The number of lighted overhead traffic signs of each designated class of assembly, complete.
- (3) The number of existing signs removed, relocated, modified of each designated class of assembly, complete.
- (4) The number of overhead signs span wire mounted, bridge mounted, and lighted sequential, of each designated class of assembly, complete.

For the purpose of payment, a sign assembly consists of all the signs mounted on a single structure (one, two or three posts, or overhead structure) or all the signs on a bridge mounted sign structure and the sign structure.

700-12 Basis of Payment.

Price and payment will be full compensation for furnishing and installation of all materials necessary to complete the signs in accordance with the details shown in the plans; including sign panels complete with sheeting, painting, and message; sign posts and supports, foundations, excavation, etc.; for the lighted signs, all costs of the electrical installation for lighting, up to the point of connection by others; and all other work specified in this Section, including all incidentals necessary for the complete item.

Payment will be made under:

Item No. 700-20-11 Single Post Traffic Sign	-Each
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**780 INTELLIGENT TRANSPORTATION SYSTEMS-GENERAL REQUIREMENTS.
(REV 8-7-06) (FA 8-15-06) (1-10)**

PAGE 813. The following new Section is added after Section 715:

**SECTION 780
INTELLIGENT TRANSPORTATION SYSTEMS
GENERAL REQUIREMENTS**

780-1 Description.

The provisions contained in this Section include general requirements for all intelligent transportation system (ITS) devices and equipment used on Florida's limited-access and non-limited-access corridors and in transportation management centers (TMCs).

780-2 Equipment and Materials.

Use only ITS equipment and components that meet the requirements of these specifications, and which are listed on The FDOT's Approved Product List (APL). Use only new equipment and materials, except as specified in the Contract Documents. Ensure that firmware and software furnished and installed as part of an ITS project are the most current and approved releases or versions. Firmware and software updates released during Contractor and manufacturer warranty periods shall be made available at no cost to The City.

Meet the following requirements:

General Requirements for the Installation and Evaluation of	
Traffic Control Signal Equipment and Materials.....	Section 603
Guaranties	Section 608
Acceptance Procedures	Section 611
ITS Motorist Information Systems	Section 781
ITS Video Equipment	Section 782
ITS Fiber Optic Cable and Interconnect	Section 783
ITS Network Devices.....	Section 784
ITS Infrastructure.....	Section 785
ITS Vehicle Detection and Data Collection.....	Section 786

780-3 Installation Requirements.

Install ITS equipment as detailed in the plans, following the manufacturer's recommendations, and with the review and approval of the Engineer.

Furnish all tools, equipment, materials, supplies, and manufactured hardware necessary for a complete installation. Perform all operations and equipment integration necessary to ensure that the finished ITS equipment functions as depicted in the plans.

Materials and workmanship shall conform to the requirements of the NEC, the National Electrical Safety Code (NESC), and applicable codes of governing jurisdictions.

780-4 Grounding and Transient Voltage Surge Suppression.

Properly ground all ITS equipment and materials to provide personnel and equipment protection against faults, surge currents, and lightning transients. Ensure that the grounding system used meets the grounding requirements defined in Section 620 and in Section 785-1.

Install all ITS components with surge suppressors and lightning arrestors as shown in the plans and according to the ITS device manufacturer's recommendations. Ensure that the surge suppressors and lightning arrestors are capable of meeting or exceeding the device protection requirements as contained in Section 785-1 and that they are listed on The FDOT's APL. Consider multiple devices installed in the same field cabinet to be a single installation for the purpose of providing grounding and surge suppression under this paragraph. Protect all power, data, and video lines.

780-5 Testing.

Perform the required tests for the ITS equipment installed. Notify the Engineer of ITS installation testing at least 14 days in advance.

Provide the test procedures to the Engineer at least 14 days in advance for approval prior to commencement of testing. Ensure that the test plan demonstrates each and every functional requirement specified for the device or system under test.

Furnish all equipment, software, and supplies necessary for conducting the tests. Include in the test documentation the last calibration date of all test equipment, along with the test parameters as set on the equipment.

All test results shall be compared with their corresponding specifications. Failure to conform to the specifications of any test shall be considered a defect and the equipment shall be subject to rejection by the Engineer. Rejected equipment may be offered again for a retest, provided that all deficiencies have been corrected and evidence thereof has been submitted to the Engineer.

780-6 Electrical Power Service Assemblies.

Furnish and install electrical power service assemblies, either underground or overhead, for the ITS device, as shown in the plans and directed by the Engineer. Ensure that the installation meets all requirements of Section 639.

780-7 Method of Measurement.

The quantities to be paid for will be the quantity, per assembly, for electrical power service; the quantity, in feet, for electrical service wire; and the quantity, per each, for electrical service disconnect.

780-8 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, including furnishing and installing all material and hardware as specified in the Contract Documents, and all labor and equipment necessary to make a complete and accepted installation.

Payment will be made under:

Item No. 780-1-11	ITS Electrical Power Service – per assembly.
Item No. 780-1-12	ITS Electrical Service Wire – per foot.
Item No. 780-1-13	ITS Electrical Service Disconnect – each.

785 INTELLIGENT TRANSPORTATION SYSTEMS INFRASTRUCTURE.
(REV 1-26-09) (FA 2-4-09) (1-10)

PAGE 813. The following new Section is added after Section 715:

SECTION 785
INTELLIGENT TRANSPORTATION SYSTEMS
INFRASTRUCTURE

785-1 Description.

Furnish and install ITS infrastructure components as shown in the plans, meeting the general requirements of this specification and the specific requirements for each component as defined in 785-2 through 785-5.

Ensure that all materials furnished, assembled, fabricated, or installed are new products and approved by the Engineer.

785-2 Grounding and Transient Voltage Surge Suppression.

785-2.1 Description: Furnish and install grounding and transient voltage surge suppression for all ITS devices installed in the field or in remote locations to protect this equipment from lightning, transient voltage surges, and induced current.

785-2.2 Materials: Provide a grounding system that meets the grounding requirements of this section and also those defined in Section 620.

Install a transient voltage surge suppressor (TVSS) both ahead of and behind (i.e., on the supply side and the load side of) the ITS device electronics.

Install TVSS on all power, data, video and any other conductive connection. Use only equipment and components that meet the requirements of these minimum specifications, and are listed on The FDOT's Approved Product List (APL).

785-2.3 Installation Requirements:

785-2.3.1 General: Achieve a resistance to ground measurement of 5 ohms (Ω) or less between the grounding electrode and the soil by using multiple electrodes, and if necessary, soil preparation that includes a grounding augmentation fill. References for this section include, but are not limited to, UL467, UL497A, and NEC. Ensure that lightning protection systems conform to the requirements of NFPA 780, Standard for the Installation of Lightning Protection Systems.

785-2.3.2 Grounding Specifications: Use a grounding electrode system (i.e., multiple electrodes as required to achieve a resistance to ground measurement of 5 Ω or less) as shown in the plans and approved by the Engineer. Ensure that ground rods are listed according to UL requirements as detailed in the standard UL 467, Grounding and Bonding Equipment. Use electrodes that are copper clad or solid copper. Make all connections to the grounding electrode using exothermic welds.

Connect all grounding electrodes related to the ITS device and its subsystems, and any grounded electrical system within a 100-foot radius (but not beyond the edge of the roadway) of the structural base of the ITS device, to a single point main grounding electrode, sometimes referred to as the ground window, which shall be driven a maximum of 3 feet from the structural base of the ITS device. Provide for each grounding electrode an

interfacing hemisphere, which is an imaginary cylinder with a diameter and depth equal to the length of the electrode. Therefore, install a 20-foot grounding electrode a minimum of 40 feet away from any additional grounding electrodes and/or ground-mounted devices.

Install a minimum of one grounding radiant, plus additional radiants in a “Y” configuration as required to achieve a resistance to ground of $5\ \Omega$ or less, at each ITS device structure. In the event that the “Y” configuration cannot be placed in the right-of-way, change the 120-degree spacing of the radiants to make the grounding array fit in the space available, provided that the sphere of influence radius is maintained.

Install the grounding radiants using one main 20 foot grounding rod located at the structural base of the ITS device and attached to three additional 20 foot radiant grounding rods placed a minimum of 40 feet away from the main grounding rod. Bond the ITS device structure’s equipment directly to the main grounding rod using an exothermic weld. Ensure that all grounding rod attachments use a minimum #2 tin-plated bare copper wire that is exothermically welded at all connection points.

Bond all metal components of the ITS device subsystem, such as the cabinets and steel poles, to the grounding system with a grounding cable that uses a mechanical connection on the equipment side and an exothermically welded connection at the down cable.

785-2.3.3 Use of Grounding Augmentation Fill: For each grounding rod, dig a minimum 12-inch diameter hole 12 feet deep using an augured shaft. Backfill the holes with grounding augmentation fill per the manufacturer’s installation requirements. Insert 20-foot-long ground rods driven into the center of the shaft.

Install radial conductors in the center of a one foot by one foot trench backfilled with coke breeze material. Cover the top of the coke breeze trench with one foot of native soil. Neither charcoal nor petroleum-based coke breeze may be substituted for coke breeze from coal in coke ovens. Increase the shaft diameters and depth as required to meet the $5\ \Omega$ or less specification. Increase the rod length and volume of coke breeze as required to meet the specification.

With the Engineer’s approval, use such alternative fills as engineered soils treated with moisture-absorbing materials such as bentonite, conductive cement, or homogenous clays in combination with native soils. Ensure that the grounding augmentation fill is environmentally safe and stable. Refer to the table below for materials and their characteristics.

Table 3.1 – Characteristics of Grounding Augmentation Fills		
Material	Characteristics	Effect
Bentonite	Highly variable in volume and resistivity with respect to soil moisture.	2.5 ohm-meters
Clay-based material	High capability to retain moisture.	0.3 to 0.8 ohm-meters
Coke breeze	Carbon-based backfill material. Environmentally safe and not moisture dependent.	0.1 to 0.5 ohm-meters
Conductive cement	Retains moisture once hardened. Resists leaching from soil.	0.2 ohm-meters

785-2.3.4 Ground Resistance Testing and Certification: Measure the ground resistance with an instrument designed specifically to measure and document earth/ground resistance, soil resistance, and current flow. Conduct the test by using the Fall-of-Potential method as described in the IEEE Standard 142-1991. Provide the Engineer with written test results for each testing location prior to backfilling the grounding electrode. Include in the test results the instrument model and date of calibration for the device used in the testing, the local environmental conditions at the time of testing, and a full Fall-of-Potential graph. Certify and sign the test results submitted.

785-2.3.5 Air Terminals: Ensure that lightning protection systems and air terminals installed conform to NFPA 780, Standard for the Installation of Lightning Protection Systems. Ensure that the air terminal extends at least 2 feet above the object or area it is to protect and is mounted at the top of the pole or structure in such a way as to allow for an exothermic weld connection to the grounding down cable. Ensure that all ITS devices attached to structures having air terminals are within the zone of protection determined by the 150-foot radius rolling sphere model described in NFPA 780.

Provide a lightning protection system as shown in the plans. Provide additional air terminals, static wires, and conductors as required by the manufacturer of large equipment such as DMS units that may necessitate more than one terminal to protect the structure and equipment. Use air terminals that are UL listed according to the UL 96A standard and that are suitable for use in a UL master label lightning protection system.

785-2.4 Transient Voltage Surge Suppression Devices:

785-2.4.1 General: Provide all ITS field installation sites with both primary and secondary surge protection on the AC power. Connect the primary surge protection at the service entrance or main disconnect. Connect the secondary surge protection on the power distribution to the equipment. Furnish only TVSS devices that have been approved in writing by the Engineer.

785-2.4.2 TVSS Device at Power Entry Point: Install a TVSS at the closest termination/disconnection point where the 120-volt (V) supply circuit enters the ITS device cabinet. Locate the TVSS on the load side of the service disconnect and ahead of any and all ITS electronic devices. Configure the TVSS to operate at 120 V single phase (i.e., two wires) or 120/240 V single phase (i.e., three wires) as required to match the supply circuit configuration. Verify that the TVSS has been labeled to indicate that the unit is UL listed and meets the

requirements of UL 1449, Second Edition. Install a TVSS that complies with the requirements as detailed in Section 2.2.7 of the NEMA LS 1-1992 (R2000) standard.

Ensure that the TVSS for the ITS device's power source has an operating voltage of 120 V single phase and a maximum continuous operating voltage of 150 V single phase. The TVSS shall be rated at a minimum of 150 kiloamps (kA) per phase, or when protecting a panel board rated at 150 to 225 amps, the TVSS shall be rated at a minimum of 220 kiloamps (KA) per phase. The results of testing this device for maximum let-through voltage using the IEEE C62.41.2-2002 Category C3 and B3/C1 waveforms shall be submitted for approval and for equal comparison the following special test conditions shall be adopted: Apply the transient at the 90-degree phase angle, measured at a lead length of 6 inches outside of the device enclosure. The maximum ANSI/IEEE let-through voltage shall be 1000 V line to neutral, when measured according to the IEEE C62.41.2-2002 Category C3 at 20 kilovolts (kV) 1.2 by 50 microseconds (μ s)/10 kA 8 by 20 μ s waveform; and 500 V line to neutral for the Category B3/C1 at 6 kV 1.2 by 50 μ s/3 kA, 8 by 20 μ s waveform.

Ensure that the suppression device is a hybrid, multi-staged device with a visual indication system that monitors the weakest link in each mode and shows normal operation or failure status and also provides one set of normally open (NO)/normally closed (NC) Form C contacts for remote alarm monitoring. The enclosure for a TVSS shall have a NEMA 4 rating.

785-2.4.3 TVSS Device at Point of Use: Install a TVSS at the point the ITS devices receive 120 V power. Ensure that the units are rated at 15 or 20 amps (A), as required, and configured for hardwiring or receptacles to meet the ITS device requirements. Receptacle configuration units may be grouped as long as all listing and performance requirements can be met. Verify that the TVSS has been labeled to indicate that the unit is UL listed and meets the requirements of UL 1449, Second Edition. Install a TVSS that complies with the requirements of Section 2.2.7 of the NEMA LS 1-1992 (R2000) standard.

Ensure that the TVSS for the ITS device's point of use has an operating voltage of 120 V single phase and a maximum continuous operating voltage of 150 V single phase. Ensure that the TVSS is rated at a minimum of 20 kiloamps (kA) per phase. The results of testing this device for maximum let-through voltage using the IEEE C62.41.2-2002 Category A1 waveform shall be submitted for approval and for equal comparison the following special test conditions shall be adopted. The transient shall be applied at the 270-degree phase angle and measured at a lead length of 6 inches outside of the device enclosure. The maximum allowable excursion of the let-through voltage from the service voltage sine wave when testing with the A1 waveform is 45 V line to neutral mode, 60 V line to ground mode, and 35 V neutral to ground mode.

Ensure that the suppression device is a hybrid, multi-staged device with a visual indication system that monitors the weakest link in each mode and shows normal operation or failure status. Hardwired type units shall also include one set of dry contacts to transmit this status information to other monitoring systems. Ensure that these units have internal fuse protection and provide both normal mode (L-N) and common mode (L+N-G) protection.

785-2.4.4 TVSS Device for Low-Voltage Power, Control, Data and Signal Systems: Install a specialized TVSS at the supply and line sides of all low-voltage connections to the ITS device and its operating subsystems. These connections shall include, but are not limited to, Category 5 data cables, coaxial video cables, twisted pair video cables, and low-voltage control cables that comply with Electronic Industries Alliance (EIA) requirements as

detailed in the EIA-232/422/485 standards. Ensure that these devices are of hybrid multi-staged design with maximum let-through voltage as shown in the accompanying table. Testing shall be for all available modes (i.e. power L-L, L-G; data and signal center pin-to-shield, L-L, L-G, and shield-G where appropriate).

Table 4.1 – Values for Low-Voltage Circuits				
Circuit Description	Continuous Current	Frequency/ Bandwidth/ Data Rate	Surge Capacity	Let-Through Voltage (All voltages are measured from zero)
Coaxial Video	Up to 300 mA	Up to 1.5 GHz Up to 150 Mbps	10,000 amps per mode (8x20 μ s)	<100 Vpk (IEEE Cat B3/C1 6 kV/3 kA)
Power and Control Up to 12 V	Up to 30 A	Up to 60 Hz (sensitive loads)	5,000 amps per mode (8x20 μ s)	<150 Vpk (IEEE Cat B3/C1 6 kV/3 kA) <50 Vpk (IEEE Cat A1 Ringwave 2 kV)
Power and Control Up to 24 V	Up to 30 A	Up to 60 Hz (sensitive loads)	5,000 amps per mode (8x20 μ s)	<175 Vpk (IEEE Cat B3/C1 6 kV/3 kA) <50 Vpk (IEEE Cat A1 Ringwave 2 kV)
Power and Control Up to 48 V	Up to 30 A	Up to 60 Hz (sensitive loads)	5,000 amps per mode (8x20 μ s)	<200 Vpk (IEEE Cat B3/C1 6 kV/3 kA) <50 Vpk (IEEE Cat A1 Ringwave 2 kV)
Power and Control Up to 120 VAC	Up to 30 A	Up to 60 Hz (sensitive loads)	20,000 amps per mode (8x20 μ s)	<550 Vpk (IEEE Cat B3/C1 6 kV/3 kA) <50 Vpk (IEEE Cat A1 Ringwave 2 kV)
RS422 Up to 12 V	Up to 500 mA	Up to 100 MHz Up to 10 Mbps	10,000 amps per mode (8x20 μ s)	<30 Vpk (IEEE Cat B3/C1 6 kV/3 kA)
RS485 Up to 12 V	Up to 500 mA	Up to 100 MHz Up to 10 Mbps	10,000 amps per mode (8x20 μ s)	<30 Vpk (IEEE Cat B3/C1 6 kV/3 kA)
T1 Up to 7.5 V	Up to 500 mA	Up to 100 MHz Up to 10 Mbps	10,000 amps per mode (8x20 μ s)	<20 Vpk (IEEE Cat B3/C1 6 kV/3 kA)
Cat 5 Up to 12 V	Up to 500 mA	Up to 100 Mbps	3,000 amps per mode (10x1000 μ s)	<30 Vpk (10 x 1000 μ s)

Install a TVSS that has an operating voltage matching the characteristics of the device, such as 24 volts of direct current (V_{DC}) and less than 5 V_{DC} for data and video functions. Ensure that these specialized TVSS are UL 497B or UL 497C listed, as applicable.

785-3 Pole.

785-3.1 Description: Furnish and install a concrete pole, without a lowering device, as shown in the plans.

785-3.2 Materials:

785-3.2.1 Pole: Use a concrete or steel pole in accordance with Design Standard 18111 or 18113 and listed on The FDOT's Qualified Products List (QPL).

For concrete poles, use concrete meeting the requirements of Section 346 and construct in accordance with Section 450. Obtain concrete poles from a manufacturing plant that is currently on The City's list of Producers with Accepted Quality Control Programs. Producers seeking inclusion on the list shall meet the requirements of 105-3. Assume responsibility for performance of all quality control testing and inspection required by Sections 346 and 450; however the PCI personnel and plant certifications are not required.

Use a pole that is equipped with a handhole of sufficient size to provide access to the pole interior and for temporarily securing and operating the lowering tool. Ensure that the pole-top tenon is rotatable.

785-4 ITS Field Cabinet.

785-4.1 Description: Furnish and install an ITS field cabinet for housing ITS equipment and network devices including, but not limited to, managed field Ethernet switches, hub switches, device servers, digital video encoders, fiber optic cable patch panels, and equipment racks for non-intrusive vehicle detection systems. Use only equipment and components that meet the requirements of these minimum specifications, and are listed on The FDOT's Approved Product List (APL).

785-4.2 Materials:

785-4.2.1 Cabinet Shell: Furnish an ITS field cabinet that conforms to NEMA 3R requirements. Ensure that the ITS field cabinet is constructed using unpainted sheet aluminum alloy 5052-H32 with a minimum thickness of 0.125 inch. Ensure that the cabinet has a smooth, uniform natural aluminum finish without rivet holes, visible scratches or gouges on the outer surface. Other finishes are acceptable if approved by the Engineer.

The minimum dimensions for FDOT ITS field cabinets are listed below.

Required Cabinet Dimensions in Inches			
Cabinet Type	Height	Width	Depth
336	36-39	24-26	20-22
336S	46-48	24-26	22-24
334	66-68	24-26	30-32

Ensure that the ITS field cabinet enclosure top is crowned to prevent standing water. Construct the field cabinet so that it is weather resistant under all conditions. Ensure all exterior cabinet and door seams are continuously welded and smooth. All welds shall be neatly formed and free of cracks, blow holes and other irregularities. Verify that all exterior cabinet welds are made using the gas tungsten arc (TIG) welding method. Ensure that all internal cabinet welds are done using the gas metal arc (MIG) or TIG process. Other welding methods may be used only if approved by the Engineer. Ensure that all inside and outside edges of the cabinet are free of burrs. Ensure that all edges are filled to a radius of 0.03125 inch minimum. Use ER5356 aluminum alloy bare welding electrodes conforming to American Welding Society standard AWS A5.10 requirements for welding on aluminum. Procedures, welders and welding

operators shall conform to AWS requirements as contained in AWS B3.0 and C5.6 for aluminum.

Ensure that the field cabinet is furnished with two lifting eye plates on either side of the top for lifting the cabinet and positioning it. Ensure that each lifting eye opening has a minimum diameter of 0.75 inch and that each eye is able to support the weight load of 1,000 pounds. Ensure that all external bolt heads are tamperproof.

785-4.2.2 Doors: Provide an ITS field cabinet with front and rear doors, each equipped with a lock and handle. Ensure that each cabinet door is full size, matching the height and width dimensions of the cabinet enclosure, and has no fewer than three stainless steel hinges or alternately, one full-length "piano" hinge. Provide hinges that are made of 14-gauge stainless steel and ensure that the stainless steel hinge pins are spot-welded at the top. Mount the hinges so that they cannot be removed from the door or cabinet without first opening the door. Brace the door and hinges to withstand a 100-pound-per-vertical-foot of door height load applied vertically to the outer edge of the door when standing open. Ensure there is no permanent deformation or impairment of any part of the door or cabinet body when the load is removed.

Ensure that both door openings are double flanged on all four sides, and that the doors include a closed-cell, neoprene gasket seal that is permanently bonded to the inside of each door such that the neoprene forms a weather-tight seal when the door is closed. The Engineer may approve alternative cabinet designs that use special material combinations and gauges.

785-4.2.3 Latches: Furnish all ITS field cabinets with a three-point latching system for the doors. Ensure that the latching system consists of the following latching points.

1. Center of the cabinet (lock).
2. Top of the cabinet – controlled by the door handle.
3. Bottom of the cabinet – controlled by the door handle.

Ensure that latching points 2 and 3 remain in the locked position until the main cabinet door lock is unlocked. When the lock is unlocked, rotation of the door handle shall allow the main door to swing open. Ensure that the locking mechanism is equipped with nylon rollers to secure the top and bottom of the door.

Furnish the ITS field cabinet with a door stop that retains the main door open in a 90-degree and 120-degree position.

Outfit the doors with an industrial standard pin tumbler lock with #2 key, or an approved alternate if shown in the plans, and hardware that allows the door to be secured using a padlock. Provide two keys for each cabinet lock.

785-4.2.4 Rails: Provide the ITS field cabinet with four cabinet rails that form a cage for the purpose of mounting miscellaneous wiring panels and various mounting brackets. Use rails that extend the length of the cabinet's sides, starting from the bottom of the enclosure. Provide rails that are either 0.1345-inch thick plated steel or 0.105-inch thick stainless steel. Ensure that the rails are keyhole designed with slots 2 inches on center with a top opening of 5/8 inch in diameter to allow the insertion of a 5/8-inch by 1-inch carriage bolt. Ensure that the rails are 1 1/2 to 2 inches wide by 1/2 inch deep. Do not use unistruts or other rail types.

Provide rails that have been drilled and tapped for 10-32 screws or rack screws with EIA universal spacing.

785-4.2.5 Racks: Ensure that the ITS field cabinet includes a standard 19-in EIA/TIA equipment rack centered in the cabinet for mounting of the devices to be installed inside. Verify that the clearance in the rack between the rails is 17.75 inches.

785-4.2.6 Shelf: Provide a level, rollout internal shelf with a minimum work area measuring 10 inches by 10 inches. Ensure that the shelf is capable of sustaining a constant 20-pound load. Ensure that the shelf position is adjustable, with a maximum of 2-inch increments, from the top of the load panel to 12 inches from the top of the controller cabinet.

785-4.2.7 Sunshield: If the ITS field cabinet is provided with sunshields outside to deflect solar heat away from the cabinet, as indicated in the plans, the sunshields must be offset a minimum of one inch from the exterior cabinet walls. Ensure that the sunshields are fabricated from 5052-H32 aluminum sheet that is 0.125 inch thick, and that sunshield corners are rounded and smoothed for safety. Mount the sunshields on standoffs at the top and each side of the cabinet.

785-4.2.8 Ventilation: Ensure that the cabinet provides ventilation through the use of a louvered vent at the bottom of the main door. Verify that the louvered vent depth does not exceed 0.25 inch. Ensure that the intake vent is made rain tight through the use of a water-deflecting ventilation panel on the inside of the main door securing the filter to the door. This panel should form a shell over the filter to give it mechanical support, and should be louvered to direct the incoming air downward.

Provide an easily removable, reusable filter held in place with a bottom trough and a spring-loaded upper clamp. Provide a filter that measures no less than 16 inches by 12 inches by 7/8 inch thick. No incoming air shall bypass the filter. Ensure that the bottom trough holding the filter is able to drain any accumulated moisture to the outside of the field cabinet.

Equip the ITS field cabinet with dual thermostatically controlled fans located inside at the top of the cabinet. Use UL-listed exhaust fans having a minimum air flow rating of 100 cubic feet per minute. Ensure that the electric fan motors have ball or roller bearings. Provide fans that are rated for continuous duty and have a service life of at least three years. Vent the exhaust air from openings in the roof of the field cabinet.

Ensure the thermostats that activate the fans are mounted on the inside top of the cabinet. Ensure that the thermostat is user adjustable to allow temperature settings ranging from a minimum of 70° Fahrenheit (F) to a maximum of 160° F. Ensure that the thermostat activates the fans within ± 3 degrees of the set temperature.

785-4.2.9 Electrical Requirements: Ensure that all equipment furnished conforms to applicable UL, NEC, EIA, ASTM, ANSI and IEEE requirements. Provide transient voltage surge suppressors (TVSS) for the main AC power input at the service panel assembly and on both sides of all electronics as required by 785-2. Ensure that the TVSS is accessible from the front of any panel used in the cabinet. Connect the TVSS for the cabinet's main AC power input on the load side of the cabinet circuit breaker.

Ensure that the wiring in the ITS field cabinet conforms to NEC requirements. Use only conductors that are stranded copper. Lace all wiring.

785-4.2.9.1 Service Panel Assembly: Provide a service panel assembly to function as the entry point for AC power to the cabinet and the location for power filtering, transient suppression and equipment grounding. Provide branch circuits, TVSS, and grounding only as required for the ITS device-connected load served by the cabinet, including ventilation fans, internal lights, electrical receptacles, etc., as shown on the plans.

785-4.2.9.2 Terminal Blocks: Terminate electrical inputs and outputs on terminal blocks where the voltage and current rating of the terminal block is greater than the voltage and current rating of the wire fastened to it.

Wire into the cabinet's circuitry the connector harnesses for the ITS devices and other accessory equipment to be housed therein.

Terminate conductors on terminal blocks using insulated terminal lugs large enough to accommodate the conductor to be terminated. When two or more conductors are terminated on field wiring terminal block screws, use a terminal ring lug for termination of those conductors. Number all terminal block circuits and cover the blocks with a clear insulating material to prevent inadvertent contact.

785-4.2.9.3 Ground Bus Bar: Ensure that ground bus bars are fabricated from a copper alloy material compatible with copper wire. Use ground bus bars that have at least two positions where a #6 AWG stranded copper wire can be attached.

Mount the ground bus bar on the side of the cabinet wall adjacent to the service panel assembly for the connection of AC neutral wires and chassis ground wires. If more than one ground bus bar is used in a cabinet, use a minimum of a #10 AWG copper wire to interconnect them.

785-4.2.9.4 Power Distribution Assembly: Furnish a power distribution assembly that fits in the EIA 19-inch rack and provides for protection and distribution of 120/240 V_{AC} power.

785-4.2.9.5 Interior Lighting: If shown on the plans, provide the field cabinet with two 20-watt fluorescent lamps and clear shatter-proof shield assemblies which are mounted on the inside front and rear top of the cabinet. Ensure that these lamps are unobstructed and able to cast light on the equipment. Equip the field cabinet with door-actuated switches so that the lamps automatically turn on when either cabinet door is opened and go off when the doors are closed.

785-4.2.9.6 Generator and Auxiliary Power Connection: If shown on the plans, furnish an ITS field cabinet that has provisions for the connection of an external power source, such as a portable generator, through a weatherproof, water-resistant, secure interface. This feature should allow authorized personnel to access, connect, and secure an external power source to the cabinet in order to restore power within 5 minutes of arrival at the ITS field cabinet. Provide the field cabinet with a transfer switch rated equal to or higher than the design load of the cabinet's main breaker and the generator input twist-lock connector rating. Ensure that the transfer switch provides a means of switching between normal utility power and auxiliary backup generator power. Ensure that the switching time between sources is no longer than 250 milliseconds. Ensure that the transfer switch meets UL Standard 1008. Ensure that the transfer switch does not allow simultaneous active power from two sources and does not allow generator backflow into normal utility AC circuits.

785-4.2.9.6.1 Manual Transfer Switch: Ensure the manual transfer switch is a two-position switch. Label the switch positions as "Generator Power" and "Utility Power".

Equip the transfer switch with a "Utility-on" indicator, which will illuminate when normal utility power service is available and the switch is in the "Generator Power" position. The indicator must turn off when the transfer switch is moved to the "Utility Power" position. Ensure that the Utility-on indicator is clearly visible outside the cabinet and that the indicator's on/off state can be visually determined from a distance of 30 feet.

785-4.2.9.6.2 Automatic Transfer Switch: To provide for automatic transition from generator power back to normal utility service after utility power is restored, an automatic transfer switch may be used instead of a manual transfer switch. Ensure

that the automatic transfer switch has indicators that display the status of connected power sources and indicate which power source is actively energizing the cabinet.

If a relay circuit is used to provide switching, the normally closed circuits must be connected to normal utility power. The relay shall be energized only by the generator, not by the electric utility service. When energized, the relay must break the connection to normal utility power and make connection to the generator power input. Any automatic transfer switch or relay operated switch must include a bypass switch that permits the automatic switching function to be disabled and permits manual selection of the power sources connected to the cabinet.

785-4.2.9.6.3 Generator Access Panel: Include a generator connection panel consisting of, at a minimum, the manual transfer switch and three-prong, 30-amp twist-lock connector with recessed male contacts for generator hookup.

The generator interface to be used is Male Base-Nylon White; 15 AMP; 125 V; 2 pole, 3 wire grounding; and NEMA 5-15.

Locate and label the transfer switch and twist lock connector on a panel easily accessible behind a lockable exterior door. Ensure that this access door is labeled as "Generator Access Door", equipped with a tamper-resistant hinge, and that the door assembly is weatherproof and dustproof. The access door shall be provided with a #2 lock unless otherwise specified in the plans. Provide the access door with a weatherproof opening for the generator cable. The generator hookup compartment itself shall be recessed into the cabinet and be deep enough to allow closing and locking of the access door when the generator cable is connected. Limit the generator hookup compartment and access panel's intrusion into the cabinet interior to no more than 6 inches. Avoid blocking access to any other equipment in the cabinet. Locate this generator panel as close as possible to the main AC circuit breaker. Ensure that the bottom of the access panel is no less than 24 inches above the bottom of the cabinet. Never locate the generator access panel on the main cabinet door or back door.

Connect wiring from the Cabinet AC+ Input Terminal to the transfer switch. Connect the alternate power source's wiring on the transfer switch to a receptacle that can accept a 120 VAC generator cord. Install a power service wire between the transfer switch and the existing power distribution panel in the cabinet.

785-4.3 Installation Requirements.

Mount the ITS field cabinet to a concrete base or attach it to the ITS device pole or support structure, as shown in the plans, and provide the cabinet with the necessary base- or pole-mount hardware. Ensure that pole and structure-mounted field cabinets have mounting brackets on the side so that both cabinet doors are fully functional.

Supply the base-mounted field cabinet with a removable base plate. Ensure that the cabinet has welded inside two aluminum plates for anchoring the cabinet to a concrete or composite type base as shown in the plans. Fabricate the plates from aluminum alloy 5052-H32 and ensure they are 4 inches wide by 0.125 inch thick and shall have four 1-inch diameter holes.

Make provisions for all telephone, data, control, and confirmation connections between the ITS device and field cabinet, and for any required wiring harnesses and connectors.

Ensure that the cabinet manufacturer's name and FDOT certification number appear only on the inside of the main cabinet door, along with the year and month of the

cabinet's manufacture. Attach this information to the door by a method that is water resistant. Provide the field cabinet with a unique serial number that is engraved on a metallic plate epoxied to the inside of the cabinet on the upper right-hand side wall.

Mount a heavy-duty resealable plastic bag on the backside of the main cabinet door for containing cabinet prints, a list of terminal block connections, and other documentation that may be subject to damage when exposed to sunlight or moisture.

Place all equipment in the cabinet according to the recommendations of the manufacturers. A minimum clearance of 6 inches shall be provided between the top of the cabinet and the top of any equipment placed on the top shelf of the cabinet. A minimum clearance of 2 inches shall be provided between each side of the cabinet and the equipment placed on the cabinet shelves.

785-7 Method of Measurement.

785-7.1 General: Poles, with or without the lowering devices; ITS field cabinets, and equipment shelters, shall be measured for payment in accordance with the following tasks.

The work specified for grounding and transient voltage surge suppression will not be paid for directly, but will be considered incidental to the installation of ITS devices and systems.

785-7.2 Furnish and Install: The Contract unit price per pole furnished and installed will include furnishing, placement, and testing of all equipment and materials, and for all tools, labor, cables, hardware, operational software package(s) and firmware(s), supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

Except in the case of a retrofit, the work specified for furnishing and installing a lowering device will not be paid for directly, but will be considered incidental to the installation of a steel or concrete pole.

The Contract unit price for each ITS field cabinet, furnished and installed, will include furnishing, placement, and testing of all equipment and materials, and for all tools, labor, hardware, supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

The Contract unit price for each ITS equipment shelter, furnished and installed, will include furnishing, placement, and testing of the shelter, all its materials and equipment, and for all tools, labor, equipment, hardware, site preparation, site restoration, fencing, supplies, shop drawings, documentation, and incidentals necessary to complete the work.

785-7.3 Furnish: The Contract unit price per pole furnished, will include all equipment specified in the Contract Documents, plus all shipping and handling costs involved in delivery as specified in the Contract Documents.

Except in the case of a retrofit, the work specified for furnishing a lowering device will not be paid for directly, but will be considered incidental to the furnishing of a steel or concrete pole.

The Contract unit price per each ITS field cabinet, furnished, will include all equipment specified in the Contract Documents, plus all shipping and handling costs involved in delivery as specified in the Contract Documents.

The Contract unit price per ITS equipment shelter, furnished, will include all equipment specified in the Contract Documents, plus all shipping and handling costs involved in delivery as specified in the Contract Documents.

785-7.4 Install: The Contract unit price per pole installed will include placement and testing of all equipment and materials, and for all tools, labor, hardware, operational software package(s) and firmware(s), supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work. The Engineer will supply the equipment specified in the Contract Documents.

Except in the case of a retrofit, the work specified for installing a lowering device will not be paid for directly, but will be considered incidental to the installation of a steel or concrete pole.

The Contract unit price per each ITS field cabinet, installed, will include placement and testing of all equipment and materials, and for all tools, labor, hardware, supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work. The Engineer will supply the equipment specified in the Contract Documents.

The Contract unit price per ITS equipment shelter, installed, will include placement, and testing of the shelter, all its materials and equipment, and for all tools, labor, equipment, hardware, site preparation, site restoration, fencing, supplies, shop drawings, documentation, and incidentals necessary to complete the work. The Engineer will supply the equipment shelter specified in the Contract Documents.

785-8 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section.

Payment will be made under:

- | | |
|--------------------|------------------------------|
| Item No. 785-1-13 | ITS Pole, per each. |
| Item No. 785-2-111 | ITS Field Cabinet, per each. |

APPENDICES

TECHNICAL SPECIAL PROVISIONS

Definitions and Acronyms:

The following definitions and Acronyms apply only to this Technical Special Provisions (TSP).

AASHTO

Acronym for the American Association of State Highway and Transportation Officials.

Blank Out Sign (BOS).

A type of DMS that displays a single message, or no message (blank). The message is pre-determined and generally not alterable.

Cable Category (CAT).

Application and bandwidth rating system for UTP cabling. Categories 1 through 6 are based on EIA/TIA-568-B standards. Category is typically abbreviated CAT. UTP Category 5, 5e, and 6 are used for Ethernet data cabling applications. Ethernet wiring distances are limited to a maximum of 100m (328 -ft.), when using UTP wiring.

CCD Format.

Indicates the size of the camera sensor used. In general, the larger the sensor, the more sensitive the camera and the better the image quality.

Charge Coupled Device (CCD).

The most common type of solid state image sensor used in CCTV cameras. The sensor converts light energy into electrical signals.

Closed Circuit Television (CCTV).

CCTV is used to define any camera system that is not part of a video detection system (VID). CCTV is a camera system in which signals are distributed via cables to a closed network of monitors.

Central Controller.

The computer system and related software that, from a remote site (often called "Central"), directs the operation and management of one or more DMS's. It is capable of continuously monitoring each sign and sign status. It offers a workstation interface in client-server type architecture, allowing multiple clients to provide user interfaces to sign operators. The Central Control system shall be based on Microsoft Windows platforms.

CO

Acronym for Central Office Equipment.

CPE

Acronym for Customer Office Equipment.

Changeable Message Sign (CMS).

A type of DMS that displays two or more fixed messages. The messages can be text or graphics such as arrows, 'X', etc. CMS messages are pre-determined and generally not alterable.

Dynamic Message Sign (DMS).

A sign system that can change the message presented to the viewer, such as VMS (Variable Message Sign), CMS (Changeable Message Sign), or BOS (Blank Out Sign). DMS includes the following components: Sign housing & sign face; sign controller and other electronics devices; and, if present, the controller cabinet.

IP

Acronym for Internet protocol.

Local Area Network (LAN).

LAN is a computer network covering a small physical area, like a home, office, or small group of buildings, such as a school, or an airport.

Management Information Base (MIB).

A set of software object definitions that define the attributes, properties and controllable features of devices on a network, that can be remotely monitored, configured and controlled.

Message.

Text or numerals that is to be presented as a message to motorists using a Scrolling Mylar Sign's (SMS) film module display.

MPEG-4.

A digital video encoding and compression standard that uses interframe encoding to significantly reduce the size of the video stream being transmitted.

MJPEG .

A Motion JPEG is a digital video encoding standard where each video frame is separately compressed into a JPEG image.

NEMA.

Acronym for National Electrical Manufacturers Association.

NTCIP.

Acronym for National Transportation Communications for Intelligent Transportation System Protocol.

National Television System Committee (NTSC).

NTSC is the standard for analog television transmission in the United States and many other countries like Japan, South Korea, Taiwan, Burma, and some Pacific island nations and territories.

PAL.

Acronym for Phase Alternating Line, is an analog television encoding system used in broadcast television systems in large parts of the world.

Poll.

The Central Controller and Maintenance Computer communicates with a DMS and collects status information. This process is generally referred to as a "Poll". The Central Controller normally has the ability to automatically Poll the sign at different intervals, such Polls are known as "AutoPolls".

Portable Maintenance Computer.

A laptop computer, with software that enables it to operate both as a remote client to the Central Controller and/or a maintenance terminal at the sign controller location. In its maintenance terminal mode, an operator can connect the laptop computer to the sign controller and run diagnostic tests on the sign; as well as select or program messages for that sign. In its remote client operation, an operator can connect to the Central Controller as a client and gain full access to the functions of the Central Controller.

Preconnectorized Fiber Drop Cable.

Preconnectorized fiber drop cables are factory cut to length with installed connectors.

Pan-Tilt-Zoom (PTZ).

PTZ is the industry standard method to represent the dynamic control system for CCTV cameras. PTZ typically is either a copper or fiber data signal circuit between the controlling source and the camera.

Right of Way (R/W).

This document uses the acronym R/W for public right of way not part of any private property.

Scrolling Mylar Sign (SMS).

For purposes of this specification, a SMS is a special-purpose VMS. It is generally used for posting variable speed limits based on prevailing conditions or events. The messages are not static and can be reprogrammed as necessary from a remote location.

Sign Controller.

A dedicated computer processor that operates the sign electronics autonomously or under central control. It contains all processes and functions to collect sensor information within the sign (and optional sign control cabinets), and operates all devices within the cabinets.

SM fiber.

An Acronym for single mode fiber.

SNR.

An Acronym for Signal to Noise Ratio. A measurement of the noise level in a signal

expressed in dB (decibels).

Traffic Control Cabinet (TCC).

The traffic control cabinet houses the electronic traffic control equipment located at each intersection.

Traffic Controller (TC).

The traffic controller controls the traffic signals at each intersection.

Transient Voltage Surge Suppression (TVSS).

Transient voltage surge suppression or transient voltage surge suppressors (TVSS) are used in this project to provide lightning protection for video, data and power circuits.

TVL or TV Lines.

TVL is a monochrome specification that states how many black and white lines can be seen in a given area. TVL in general terms is a horizontal measurement of how fine a detail from a scene can be resolved on a display.

Uninterruptible Power Source (UPS).

A device that provides battery backup when the electrical power fails or drops to an unacceptable voltage level during.

Unshielded Twisted Pair (UTP).

A common type of cable that consists of two or more unshielded wire twisted around each other in pairs. UTP cable is used extensively for local area networks and telephone applications.

Variable Message Sign (VMS).

A type of DMS that allows a user to create and download a variety of messages to be displayed on the sign

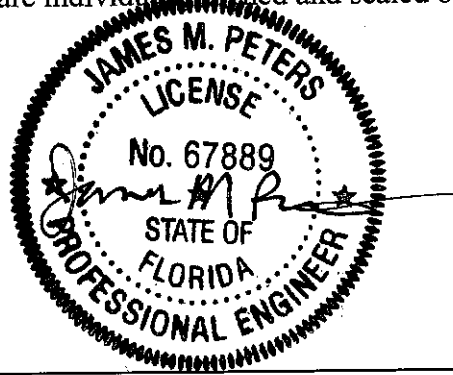
Workstation.

This computer functions as a remote client to the Central Controller. A workstation operator can connect to the Central Controller and gain access to the functions of the Central by using the appropriate access codes.

TECHNICAL SPECIAL PROVISIONS

FOR TRAFFIC MONITORING SITE – TRAFFIC COUNTER AND TRAFFIC CLASSIFICATION EQUIPMENT

The following Technical Special Provisions are individually signed and sealed but are included as part of this Specifications Package.



Prepared By: James M. Peters, P.E.
Florida Registration No. 67889
Date: January 17, 2011
Pages 75 through 85

TRAFFIC MONITORING SITE – TRAFFIC COUNTER AND TRAFFIC CLASSIFICATION EQUIPMENT

743-1 Description.

Furnish and install a Traffic Monitoring Site (TMS) meeting the requirements defined in sections 743-1 through 743-5, and in accordance with the plans, Contract Documents, and City of Ocala standards. Use only Engineer of Record approved new equipment and components that meet the requirements of these minimum specifications. This includes furnishing and installing a permanent traffic monitoring site at the locations shown on the plans, in compliance with FDOT's most current Standard Specifications for Road and Bridge Construction, Design Standards, plans and Contract Documents.

743-2 Materials.

A TMS shall be compatible with city of Ocala standards and existing TMS equipment as documented in the city of Ocala. The TMS is to be designed, manufactured, installed, and operational in conformance with the specifications. This includes the traffic counter with cabinet enclosure (pedestal), electrical power, vehicle detection (loops and piezo), software, and communications, wiring and cabling, including all items and equipment necessary for the satisfactory operation.

743-3 Installation and Construction of Traffic Monitoring System.

Furnish and install a TMS with an automatic data recorder (ADR) meeting the following specifications and criteria.

1. A TMS shall be performance based compatible existing TMS equipment and with city of Ocala standards.
2. A permanent rack, shelf, or panel mounted automatic data recorder (traffic counter and classifier unit), with cabinet enclosure as shown on the plans
3. The ADR has an integrated control panel with LED readout, and display is capable of 20 digit by 4 line LCD (liquid crystal display), with a front panel keyboard, and front panel reset switch
4. The ADR has at least 24 inputs, and expandable to 64 inputs, with an ability to classify up to 32 multi lanes of traffic, and with the ability for a user defined classification scheme
5. Provide, install and connect high speed communications, telemetry, wiring, cable and connections. Ensure the ADR has selectable RS232-C DB-9 connector port of between 300 and 19,200 (expandable to 115,200) baud for modem connection, and a counter rate up to 200 counts per second
6. The ADR has 2MB memory and capable of PCMCIA (Personal Computer Memory Card International Association) memory expansion
7. The ADR has electrical power source capability of 115VAC (volts alternating current), with battery backup, and is capable of solar power operation
8. The ADR has an internal real time clock maintains time and date, and automatic daylight saving adjustment
9. The ADR has CPU electronics include a replaceable socket mounted fuse, and

- includes an Intel® 80C186 microprocessor
- 10. The ADR has front panel mounted LED's blinking twice indicating a successful start of the microprocessor, and front panel mounted reset switch
- 11. The ADR has LED's capable of warning of system fault, and capable of indicating the communications port action and status
- 12. Each ADR unit is capable of performing up to eight studies, and record per vehicle records, with up to 356 bins of data, and 3,280 days of volume data storage capacity
- 13. Each ADR unit is tested during a computer controller environmental chamber test cycle, based on NEMA (National Electrical Manufacturers Association) TS/2 standards
- 14. Each ADR unit's input circuits are designed and tested to the NEMA TS/2 standards for lightning surge protection

743-3.1 Software.

Furnish and Install software for the ADR TMS in conformance with the following specifications and criteria.

1. Upgrade City's existing Windows® based operating and reporting software, from Traffic Operations & Planning Software (TOPS) Essential version(current City version), to Enterprise version, which supports, controls and formats the data, and capable of multi file processing, stores and shares data files into a single database.
2. Ensure the user can edit, preview and generates daily, weekly and monthly reports.
3. Capable of user defined classification, and capable of exporting to various other traffic software.

743-3.2 General Components.

Provide all other components necessary to operate the TMSs, in addition to the data collection hardware and software.

743-4 Communications.

743-4.1 Wireless Interconnect.

The Work to be done under this Contract consists of the following on Various Roadways in the City of Ocala, Martin County, Florida.

1. Furnish and install a wireless radio interconnect system to provide communication between three traffic monitoring stations (TMS 99, TMS 133, and TMS 148) to neighboring traffic signals. From the existing traffic signal locations(60th Avenue at 20th Street; SE 10th Street at 27th Avenue; and SR 40 at 27th Avenue, the communication method back to the City's Traffic Management Center will be via City's fiber optic cable network.

- I. Furnish, install and make operational antennas, radio modems, lightning protection, antenna cables, serial cables and necessary attachment/mounting hardware at three (3) City of Ocala owned and operated TMSs. Equipment installed by the Contractor will be on new service poles, existing traffic signal poles and new and existing conduits and cabinets.
- II. Configure, program and tune the wireless system to provide reliable communications between the remote radio modems at existing traffic signals and TMSs.

The Contractor shall provide communications to the following locations.

Traffic Monitoring Station 99 –This work consists of the following:

- Furnish, install and make operational 900MHz serial radio modems, antennas, antenna cables, and necessary attachment/mounting hardware between the TMS and the traffic signal cabinet located in southeast corner of SR 40 at 27th Avenue.
- Furnish, install and make operational the connection between radio modem and the Ethernet switch at the intersection of SR 40 at 27th Avenue.
- Configure, program and tune the wireless system to provide reliable communications between the traffic signal cabinet at the southeast corner of SR 40 at 27th Avenue, and the new service pole located at the traffic monitoring station.

Traffic Monitoring Station 133 –This work consists of the following:

- Furnish, install and make operational 900MHz serial radio modems, antennas, antenna cables, and necessary attachment/mounting hardware between the TMS and the traffic signal cabinet located in southeast corner of 10th Street at 27th Avenue.
- Furnish, install and make operational the connection between radio modem and the Ethernet switch at the intersection of 10th Street at 27th Avenue.
- Configure, program and tune the wireless system to provide reliable communications between the traffic signal cabinet at the southeast corner of 10th Street at 27th Avenue, and the new service pole located at the traffic monitoring station.

Traffic Monitoring Station 148 –This work consists of the following:

- Furnish, install and make operational 900MHz serial radio modems, antennas, antenna cables, and necessary attachment/mounting hardware between the TMS and the traffic signal cabinet located in northwest corner of 60th Avenue at 20th Street.
- Furnish, install and make operational the connection between radio modem and the Ethernet switch at the intersection of 60th Avenue at 20th Street.
- Configure, program and tune the wireless system to provide reliable communications between the traffic signal cabinet at the northwest corner of 60th Avenue at 20th Street, and the new service pole located at the traffic monitoring station.

This work consists of furnishing and installing a wireless radio interconnect system that will provide communication between the TMSs and the existing traffic signal cabinet. This will enable transfer of data from the traffic monitoring stations to the city's fiber optic cable network via an Ethernet connection located within the traffic signal cabinet; this work will include:

Equipment shall conform to applicable rules and regulations of the FCC. Cable, cable assemblies and connectors shall meet NEC standards for voltage, current and environmental ratings.

Codes and Standards - Equipment shall conform to applicable rules and regulations of the FCC. Cable, cable assemblies and connectors shall meet NEC standards for voltage, current and environmental ratings.

Material Submittals - When submitting material lists for approval, identify any revisions or changes to manufacturer names, component names, and model numbers listed in these special provisions. Include a brief justification for the revision or change.

Within 30 calendar days after the contract is awarded, submit to the Engineer a complete listing of all major components of the system. Include the manufacturer's name, model numbers, catalog sheets, and/or other descriptive literature of proposed materials. The catalog cut sheets and literature shall include technical data, physical properties and operational description in sufficient detail to demonstrate that the equipment meets these specifications. The Engineer's approval is required prior to the committing of any materials or the commencement of any work.

The Engineer shall either approve or disapprove each submitted item within 10 working days of submittal subject to the completeness of the contractor's submittal. Actual elapsed time for the Engineer's review is dependent upon the completeness and appropriateness of the documentation being submitted. Any deficiencies in the Contractor's submittals shall require additional time for approval. Any delays caused by such deficiencies shall not be grounds for extension of project consideration dates. Anticipate review intervals and schedule submittals accordingly to ensure project progress.

A submittal shall be submitted for every piece of equipment and construction item every aspect of the requirements listed for that item in these special provisions or the project plans.

In addition, keep on the job site one set of project plans showing any work that has been constructed or located differently than shown. Upon completion of the work and prior to acceptance of the project, this "As-Built" set of plans shall be certified by the Contractor or his representative, delivered to the Engineer, and acceptance shall be in the form of a signed receipt. Final payment shall be withheld until receipt of a complete set of record drawings.

There shall be no separate payment for the cost of preparing and processing submittals for each item or group of items in the project. Those costs shall be included in the price bid for the particular item or group of items, and no additional compensation shall be allowed.

Existing System Disruption and Restoration - Use every precaution to ensure that no work of this contract causes disruptions to the existing systems, except those disruptions that are planned and approved in advance, as defined herein.

Existing systems include, but are not limited to, the following:

- (a) City fiber optic cable, Ocala Electric Utility fiber optic cable

The existing City fiber optic cable is currently used for critical communications. This communications link must be maintained at all times.

Site Survey – Perform a site survey to confirm strength of radio path prior to installation of equipment.

743-4.2 Wireless Interconnect Equipment

The wireless radio interconnect system includes the following components and configuration:

Materials:

- (a) **Wireless Radios** – Wireless radios shall meet or exceed all of the following:
 - All radios shall be Frequency Hopping Spread Spectrum (FHSS) Technology. Radios supplied must meet FCC part 15 rules for unlicensed radio operation in the 902-928 MHz band.
 - Radios installed at the traffic monitoring station locations and at the traffic signal controller cabinets shall be shelf mounted.

- The radios shall be supplied with Windows® based radio software that provides configuration template/drivers for Traffic Controller applications.
- Radios shall include a software diagnostic toolset to assist in designing, configuring, monitoring and optimizing the wireless network. The system shall provide real-time diagnostics and set up menu access, without disrupting network communications.
- Any radio must be capable to serve as a Master and/or Remote.

(a-1) Minimum Radio Requirements

- **Frequency Range:**
 - 902 – 928 MHz
- **Range:**
 - Up to 60 miles (Line Of Sight)
- **Operating Modes:**
 - Master and/or Remote
- **Frequency Hopping Spread Spectrum Technology**
 - Customizable Hop Patterns (500,000 total)
- **Receiver:**
 - Receiver Sensitivity: -108dBm
- **Data Transmission:**
 - Throughput: 1200bps – 115Kbps
 - Interface: RS232 (software selectable)
- **Input Voltage:**
 - 6 – 30VDC
- Operating Temperature: -40°C to +75°C

(a-2) Minimum Software Requirements

- Local and Remote Configuration
- Pre-built Radio Drivers/Templates for Traffic Controller applications
- Spectrum Analyzer
- View/Save/Print Configuration Files (PDF format)
- Network-wide Diagnostics
- Noise Levels
- Signal Strength
- Data Packet Testing
- Alarm logging and notification of diagnostic values which exceed user settable thresholds
- VSWR (reflected power)
- Input Voltage readings (Max/Min)
- Temperature readings

(b) Yagi Antennas (mount to new service poles) – Yagi antennas shall meet or exceed all of the following:

- The Antennas and all connecting/mounting hardware shall be designed, rated and constructed for continuous, all-weather outdoor use.
- Shall be designed for use in a 900MHz wireless system.
- Designed for vertical polarization.
- Antenna and mounting system shall be rated for wind velocity >110mph.
- Include a female SMA type cable connector.
- Include the design db gain as shown on the plan set for each location.

(c) Omnidirectional 902-928 MHz Antenna (mount to existing traffic signal poles) – Mount the omnidirectional antenna at the master radio location. The omnidirectional antennae shall meet or exceed all of the following:

- Antenna Gain: 6dB.
- Frequency Range: 902-928 MHz
- Bandwidth: 26MHz.
- Maximum Power Input: 200 Watts.
- Vertical Beamwidth: 17°.
- Downtilt: 0°.
- Polarization: Vertical.
- Lightning Protection: DC Ground.
- Rated Wind Velocity: 125 MPH.

(d) Antenna cable – Antenna cables shall meet or exceed the following:

- Be type LMR.
- Conform to the grade indicated for each installation according to the plan set.
- Include Male SMA connectors on each end.
- Be rated for outdoor use.

(e) Ethernet Serial Server- Ethernet Serial Server devices shall meet or exceed the following:

General

- 10/100 base T Ethernet Serial Server (integrated)
- Allows TCP/IP communication to Serial (RS-232) devices
- Input Power: 6-30 VDC
- Power Consumption: Typical <100mA standby
- Operating Environment: -40° C to 80° C
- Humidity: 0-95% non-condensing
- Dimensions: Shelf mount: 2"W x 5"H x 6.5"D
- Enclosure type: Shelf mount: Milled Aluminum black powder coat

(f) **Lightning Protection** – Lightning protection devices shall meet or exceed the following:

- Rated for outdoor, all-weather use.
- Frequency range 125MHZ to 1000Mhz.
- Insertion loss <0.11db over frequency range.
- Turn-on 1200Vdc +/- 20%.

743-4.3 System Test Plan

Contractor shall perform equipment and system testing to verify and document functionality of the wireless radio interconnect.

All equipment shall be tested to verify proper operations. The testing shall be conducted in conformance with these Specifications. Factory testing need not be repeated; however, provide a Certificates of Compliance to verify factory testing has been conducted and that the installed equipment conforms to specifications.

Perform all adjustments and alignments required for the wireless radio interconnect links to operate. If any equipment or link fails to meet performance requirements, take necessary steps to restore the failure to required performance.

Informal testing shall be conducted as deemed necessary to prepare the wireless radio interconnect for formal testing for measurement and pay.

The testing shall demonstrate that the wireless radio interconnect functionality using the following test cases:

1. Test Cases – Test each radio, and each radio-to-radio wireless link, which uses the wireless radio interconnect:

For all wireless radios used, verify and document the following:

- System configuration and settings
- IP address, gateway, and subnet mask
- Radio modulation
- Master-slave assignment
- Login details

For the (3) wireless radio communication links, verify and document the following:

- Measure wireless signal strength between each traffic signal cabinet and TMS.
- Test Ethernet status using ping to/from each pair of system nodes. Pings shall have a maximum of 1% packet loss, 30 milliseconds round trip time, and 10 milliseconds packet delay variation.
- Demonstrate automatic restoration of communications following power loss.

- Test network communication route using ping to/from to the traffic signal cabinets at (60th Avenue at 20th Street; SE 10th Street at 27th Avenue; and SR 40 at 27th Avenue) to respective TMSs. Pings shall have a maximum 1% packet loss and 100 milliseconds round trip time.
- Test available bandwidth by performing an upload and download to the traffic signal cabinets (60th Avenue at 20th Street; SE 10th Street at 27th Avenue; and SR 40 at 27th Avenue). Upload and download speed shall be at least up to 150 kbps.

2. Equipment Report – Contractor shall provide documentation for all radio equipment and test results which include:

- Test date, tester's name, and reviewer's name.
- Equipment location, label, manufacturer, model, and serial number.
- Equipment configuration including number of antennas, antenna alignment, frequency usage.
- Equipment settings, including but is not limited to: IP address/gateway, radio modulation, master-slave assignments, login details, and a list of all non-default settings.
- Test results, including but is not limited to: wireless signal strength, ping time and destination, ping loss percent, bandwidth test results, all measured values, and pass/fail status.

743-5 Method of Measurement.

The TMS is for each installed and operational system at locations shown on the plans, and in accordance with these specifications.

743-6 Basis of Payment.

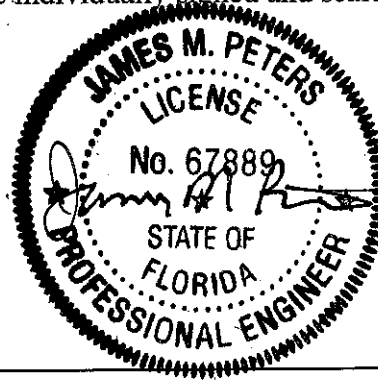
The work and materials are measured under "Method of Measurement", and paid for at the unit price for "Traffic Monitoring Site". This price is full compensation for furnishing and installing all materials and equipment, including all labor, equipment, hardware, software, technical support and personnel training, testing, shop drawings, documentation and incidentals.

Payment will be made under items:

Item No. 741-70-111 TMS VEHICLE SENSOR, CLASS II, TYPE I	-EA
Item No. 743-70-11 TMS VEHICLE SPEED/CLASS. UNIT	-AS
Item No. 745-70-12 TMS INDUCTIVE LOOP ASSEMBLY	-AS
Item No. 746-71-131 TMS, TYPE III CABINET	-EA
Item No. 747-1 TMS SYSTEM COMMUNICATION MODEM	-EA

TECHNICAL SPECIAL PROVISIONS
FOR
SCROLLING MYLAR CHANGEABLE MESSAGE SIGN

The following Technical Special Provisions are individually signed and sealed but are included as part of this Specifications Package.



Prepared By: James M. Peters, P.E.
Florida Registration No. 67889
Date: January 17, 2011
Pages 86 through 105

SECTION 781
INTELLIGENT TRANSPORTATION SYSTEMS
MOTORIST INFORMATION SYSTEMS – SCROLLING MYLAR SIGNS WITH
SOLAR FLASHING BEACON
(ELECTRONIC DISPLAY SIGNS)

781 Electronic Display Signs

781-1 Description

All Electronic Display Signs (EDS) must meet the physical display and operational requirements for warning or regulatory signs described in the FHWA Manual on Uniform Traffic Control Devices (MUTCD) and its companion document, the Standard Highway Signs Book (SHS).

EDS are specialized electronic signs that include dynamic display components. The term EDS refers to a general category of electronically enhanced signs that includes Electronic Warning Signs (EWS), Electronic Regulatory Signs (ERS), and Blank-Out Signs (BOS).

781-2 Material

EWS, ERS, and ESFS must allow a standard, static Highway Sign to be attached above, below, and beside the EDS using a single or double sign post configuration. BOS are not required to include static sign attachment provisions. All electronic assemblies must meet the requirements of FCC, Title 47 Subpart B Section 15.

781-2.1 Requirements common to all EDS

All EDS must be designed to withstand the wind loads defined in the FDOT Structures Manual without deformation or damage. EDS, other than BOS, must provide an option to include flashing beacons. Printed circuit boards shall be conformally coated. Housings that contain electronics shall be constructed of aluminum alloy sheet a minimum of .125 inches thick. Welding used during the construction of EDS must conform to the ANSI/AWS Structural Welding Code – Aluminum.

781-2.1.1 General

EDS other than BOS shall include a Static Sign Panel with an integrated dynamic display. Signs included on the Approved Products List (APL) will be designated with a size and type category and may be listed with restrictions, such as “Requires District Traffic Operations Engineer Approval”, “school zones only”, or “low speed only”.

781-2.1.2 Electronic Display Sign with Static Sign Panel

EDS that include both a static sign and dynamic display may be a modular system comprised of a static sign with an attached electronic display.

781-2.1.2.1 Static Sign Panel

Static sign panels shall meet FDOT requirements for Highway Signing found in section 700 of the Standard Specifications for Road and Bridge Construction.

781-2.1.3 Electronic Display

Electronic displays shall appear completely blank (dark) when not energized. No phantom characters or graphics will be allowed under any ambient light conditions.

781-2.1.3.1 Housing

Cover the electronic display panel with a non-glare transparent polycarbonate face to protect and seal the dynamic display and other internal electronics. The polycarbonate face must be a minimum 90% ultraviolet (UV) opaque and resistant to fading and yellowing. Electronic displays incorporated within static signs must be mounted to the back of the static sign face. The polycarbonate face shall not be recessed more than ¼" from the front of the static sign. The housing shall be NEMA 4x and IP56 rated and include a locking mechanism to prevent unauthorized access. The housing shall include weather tight cable entry or connection points for any required power or data connections.

781-2.1.3.2 Optical, Electrical, and Mechanical Specifications for Display Modules

Display Modules shall have a minimum 2-inch contrasting margin around illuminated digits. Ensure that all LEDs operate within the LED manufacturer's recommendations for typical forward voltage, peak pulsed forward current, and other ratings. Component ratings shall not be exceeded under any operating condition

781-2.1.3.3 LED and Pixel Specifications

Ensure that the LED peak wavelength output varies no more than ± 2 nanometers. Ensure that the LED pixel cone of vision is a minimum of 30 degrees (centered around the optical axis, or zero point, of the pixel). The cone perimeter is defined by the point where light output intensity is 50% of the intensity measured at the zero point of the pixel.

Ensure that the sign display produces an overall luminous intensity of at least 9200 candelas per square meter when operating at 100% intensity. Provide documentation that indicates the LED brightness and color bins that are used in each pixel. Ensure that LEDs are individually mounted directly on a PCB, and are able to be removed and replaced using conventional electronic repair methods. Encapsulated LEDs within a pixel are not allowed. ERS LEDs shall be arranged and powered in a manner that maintains a discernible message in the event of a single LED or pixel failure.

781-2.1.3.4 Character Size, Fonts, and Graphics

The minimum numeral and letter size of the electronic display must meet or exceed the numeral and letter sizes prescribed in the MUTCD and SHS companion document. Fonts and graphics shall mimic the characteristics of fonts and graphics defined in the MUTCD and SHS.

781-2.1.4 Electronic Display Controller

Any electronic display controller required for the operation of the EDS shall be housed within the sign and be equipped with a security lockout feature to prevent unauthorized use. The electronic display shall not be affected by radio transmissions. The controller shall have the capability to provide a stipulated default message upon loss of controller function. A blank message is acceptable.

781-2.1.4.1 Communication

The Electronic Display Controller shall possess a serial port with the ability to connect to a laptop computer. The serial data interface shall support multiple data rates from 9600bps to 115200 bps.

781-2.1.4.2 Configuration and Management

Ensure that the sign is provided with computer software from its manufacturer that allows a user to program, operate, exercise, diagnose, and read current status of all sign features and functions using a laptop or handheld computer.

781-2.1.5 Operation and Performance

Ensure that the EDS is visible from a distance of at least ¼ mile and legible from a distance of 400 feet for applications on roads with a speed limit less than 45MPH and visible from a distance of at least 1/2 mile and legible from a distance of at least 650 feet for roads with speed limits 45MPH or higher. In both cases, the requirements must be met under both day and night conditions.

The electronic display shall automatically adjust brightness for day and night operation in order to meet or exceed visibility requirements. The EDS shall be equipped with a photocell that accurately measures ambient light level conditions at the sign location. The EDS shall automatically adjust LED intensity based on the ambient light conditions in small enough increments that the sign's brightness changes smoothly, with no perceivable brightness change between adjacent levels. Stray headlights shining on the photoelectric sensor at night shall not cause LED brightness changes.

Message dwell time and message flash rate shall be individually programmable.

781-2.1.6 Mechanical Specifications

EDS mounting provisions and mounting hardware must accommodate sign weight and wind loading requirements of the FDOT Structures Manual. BOS must be designed to accommodate overhead attachment using a tri-stud signal hanger. Multiple tri-stud attachment points may be used to meet weight and wind loading requirements. Tri-stud attachment points must be weather-tight and structurally reinforced.

781-2.1.6.1 Fasteners and Attachment Hardware

Use only nuts, bolts, washers, and other fasteners meeting industry standards.

781-2.1.7 Electrical Specifications

All power inputs shall be fuse and reverse polarity protected.

781-2.1.7.1 Solar Power

Solar powered signs shall be capable of fully autonomous operation 24 hours per day, 365 days per year. System shall utilize 12-volt solar panels. Battery shall be a standard 12 volt deep cycle battery suitable for the application and operating environment. Charging system shall use a solar charge controller with temperature compensation. The system shall provide for automatic battery charging, overcharge protection, and have indications that display current status and faults. Signs must operate normally at voltages as low as 10.8 volts DC.

781-2.1.7.2 AC Power

AC powered signs shall be capable of operation from 89-135 volts with a frequency of 60 Hz +/- 3. The system shall not exceed a maximum power consumption of 25 watts. Fluctuations in line voltage shall have no visible effect on the appearance of the display.

781-2.2 Electronic Warning Signs

The EWS must be designed to alert road users to conditions that might call for a reduction of speed or an action in the interest of safety and efficient traffic operations. EWS shall include a secure wireless connection to communicate with a nearby laptop or other portable device.

781-2.2.1 EWS Foreground/Background Colors

The EWS display background must be flat black (Federal Standard 595A-37038) with a reflectance value not exceeding 25 percent. EWS must utilize yellow LEDs with a peak wavelength of either 585 or 590 nanometers. Ensure that the LED peak wavelength output varies no more than ± 2 nanometers.

781-2.3 Electronic Regulatory Signs

The ERS must be designed to give notice of traffic laws or regulations, such as the posted speed limit. ERS used for variable speed limit (VSL) applications must be able to display speed limits from 5-70MPH in 5MPH increments and mimic the physical appearance of a static regulatory speed limit sign as shown in the MUTCD and SHS. ERS for VSL applications shall use black characters on a white background. ERS for VSL applications must log the time and date of any speed limit change to internal non-volatile memory. The log must be able to record a minimum of 1000 events in a first-in, first-out fashion.

781-2.3.1 ERS Foreground/Background Colors and Display Types

The dynamic display of ERS used for variable speed limit applications must display black characters on a white background. Display Modules for all ERS

shall have a minimum 2-inch contrasting margin around digits, text, or graphics. Type 1 ERS must utilize LED technology for the dynamic display. Type 2 ERS must utilize scrolling-film technology for the dynamic display.

781-2.3.1.1 LED and Pixel Specifications for Type 1 ERS

Type 1 ERS shall meet the LED and Pixel specifications defined in section A698-2.1.3.3.

781-2.3.1.2 Scrolling Film Mechanism for Type 2 ERS

The dynamic display for Type 2 ERS shall utilize scrolling film module comprised of a transparent film with black characters meeting the size and shape requirements shown in the MUTCD and SHS.. The transparent film and characters shall move in front of a background panel covered with reflective sheeting identical to that used on the static sign panel. The transparent film must be constructed of material that will not yellow, fade, deform, or otherwise deteriorate over the lifetime of the sign.

781-2.3.1.3 ERS Character Size and Font

Fonts and graphics for Type 1 ERS shall mimic the characteristics of fonts and graphics defined in the MUTCD and SHS. Fonts and graphics for Type 2 ERS shall exactly match the characteristics of fonts and graphics defined in the MUTCD and SHS.

781-2.3.2 Variable Speed Limit ERS Controller Communications

ERS for variable speed applications shall be equipped with a sign controller that includes a minimum of one Ethernet 10/100 Base TX 8P8C port.

781-2.3.3 Configuration and Management Requirements for Variable Speed Limit ERS

Ensure that ERS for VSL applications can be managed remotely from a TMC or managed locally using a laptop computer. Ensure that the TMC or a laptop computer can be used to remotely reset VSL sign controllers. Ensure that ERS for variable speed limit applications will log and report status, errors, and failures, including data transmission errors, receipt of invalid data, communication failure recoveries, alternating current power failures, power recoveries, display errors, fan and airflow status, temperature status, power supply status, and information on the operational status of the temperature, photocell, airflow, humidity, and LED power supply sensors.

Ensure that the sign controller is addressable through an Ethernet communication network using software that complies with the NTCIP requirements published online by the FDOT Traffic Engineering Research Laboratory at: <http://www.dot.state.fl.us/trafficoperations>. Ensure that the sign implements any NTCIP standards required to achieve interoperability

and interchangeability. Ensure that any additional objects implemented by the software do not interfere with the standard operation of any mandatory objects. ERS must be compatible with the FDOT SunGuide[®] software.

781-2.3.4 Blank-Out Signs

ERS designed for BOS applications shall have a black exterior finish (Federal Standard 595A-37038) with a reflectance value not exceeding 25 percent. BOS shall include a visor.

781-2.3.5 ERS Battery Backup System

AC powered signs shall include a battery backup system that maintains full operation of the sign for a minimum of 2 hours in the event of utility power loss. Operation on battery backup shall have no visible effect on the appearance of the display.

781-3 Environmental Requirements

The electronic display shall be designed and constructed in a manner that prohibits fogging, frost, or condensation from forming within the dynamic portion of the sign.

781-4 Warranty

Ensure that the EDS systems and equipment furnished have a manufacturer's warranty covering defects in assembly, fabrication, and materials for a minimum of five years.

781-5 Scrolling Mylar Changeable Message Sign:

Furnish and install all electronic components, except printed circuit boards, shall be commercially available, easily accessible, replaceable and individually removable using conventional electronics repair methods. All workmanship shall comply with IPC-A-610D, Class 2 titled "Acceptability of Electronic Assemblies", ANSI/IPC-7711 titled "Rework of Electronic Assemblies" and ANSI/IPC-7721 titled "Rework and Modification of Printed Boards and Electronic Assemblies". All electronic components shall comply with Section Electronic Materials and Construction Methods specified in this document.

781-5.1 Printed Circuit Boards: Printed circuit board (p.c.b.) design will allow removal and replacement without damage to boards, traces, or tracks. Use only FR-4 material, 0.062 inch minimum thickness. Intercomponent wiring to be copper clad track, having a minimum weight of 2 ounces per square foot, and with adequate cross-section for the specified current. Jumper wires will not be permitted, except through plated through-holes. The maximum number of jumper wires allowed per circuit board is two per board. All p.c.b.'s, except for the modem p.c.b.'s, shall be completely coated with a silicone resin. The material used to coat the p.c.b.'s shall meet the military specification MIL-I-46058C Type SR, and IPC-CC-830. All p.c.b.'s shall be finished with a solder mask and component identifier silk screen.

781-5.2 Components: All components shall be of such design, fabrication, nomenclature, or other identification to be purchased from a wholesale electronics

distributor, or from the component manufacturer, except for printed circuit board assemblies:

1. Circuit design shall be such that all components of the same generic type, regardless of manufacturer, shall function equally, per the specifications.
2. All discrete components, such as resistors, capacitors, diodes, transistors and integrated circuits shall be individually replaceable. Components shall be arranged so they are easily accessible for testing and replacement.

781-5.3 Capacitors: The D.C. and A.C. voltage ratings, as well as the dissipation factor of a capacitor, shall exceed the worst case design parameters of the circuitry by 50%. A capacitor, which can be damaged by shock or vibration, shall be supported mechanically by a clamp or fastener. Capacitor encasements shall be resistant to cracking, peeling, and discoloration.

781-5.3 Resistors: Any resistor shall not be operated in excess of 50% of its power rating.

781-5.4 Semiconductor Devices: All transistors, integrated circuits, and diodes shall be a standard type listed by the EIA, and clearly identifiable.

781-5.5 Connectors: All display circuits, p.c.b. edge connectors, and cable connectors, except for those found in the power supply, battery charger, modem and sign controller, shall be base plated with nickel, and finished with 30 micro-inches of gold.

781-6 Sign Controller:

The sign controller is a microprocessor-based, fully NTCIP-compliant DMS Controller, and located inside the sign cabinet. The DMS Controller's functional settings and NTCIP options to be configured through a locally-connected laptop, when the controller is in its Local mode. The DMS Controller shall provide the following operating features:

1. Communicate through the NTCIP protocol. NTCIP natively supported. Do not use protocol converters or translator devices
2. Memory for selecting six custom speed limit values of 25, 35, 45, 55, 65, 75, and a blank position, and other necessary items for controller operation
3. DMS-specific control firmware (embedded software) to monitor all external and internal sensors, communication inputs, and controls the display modules, as directed by external control software (Central or laptop).
4. Include three NTCIP compliant RS232 communication ports.
5. Include one NTCIP compliant Ethernet port with RJ45 connector.
6. Compatible with an external Hayes-compatible modem or other communications equipment.

The DMS Controller shall be provided with the following user interface devices:

1. A "Local and Remote" switch to place the controller into its "Local" mode to

allow control from a laptop computer; or, into its "Remote" mode, to allow control through the primary NTCIP communication channel, the Central controller

2. "Local/Remote" LED, to indicate the controller's "Local/Remote" status
3. "Reset" pushbutton to quickly restart the controller
4. "Active" LED to blink when the controller is operating correctly
5. "Comm" LED's to indicate when any of the DMS Controller's NTCIP communication channels are active.

781-6.1 Sign Controller Location: The sign controller shall be mounted inside the sign cabinet with the following:

1. 5Vdc D.C.-D.C. power supply
2. Incoming communications surge protection
3. Modem
4. RS-232 cable, a minimum four feet to connect the laptop computer to the sign controller

781-6.2 Sign Controller Modem: Communication between the Central controller and the sign controller capable of operating with the modems described below.

781-6.2.1 Dial-up Modem: The dial-up modem shall be a GDI Model SM336SA modem, with a transmission speed of 33.6Kbps.

781-6.2.2 Multi-Drop Modem: The multi-drop modem shall be a GDI Model 496SA, with a transmission speed of 9600bps, and shall match the communications characteristics of the multi-drop modem at the Central office. The multi-drop modem (e.g., radio or cellular) will be provided by the FDOT.

781-6.2.3 Fiber Optic Modem: The fiber optic modem shall be a Model FO212 Multimode modem, and compatible with the fiber and communications of the fiber optic modem at the Central office. The fiber optic modem shall be provided by The City.

781-6.2.4 Switching between Dial-Up, Multi-Drop and Optic Operation: Switching between dial-up, multi-drop and fiber optic operation will require no software, hardware modifications, or tools, other than a standard screw driver. Use no jumpers or switches, except for front-panel switches to set the baud rate, or other communication parameters. The only changes will be to remove and replace the existing modem. The sign's communication parameters to be easily reconfigured from the sign controller's front panel.

781-7 Sign Controller Communication Interface:

The sign controller will include three NTCIP compliant RS232 communication ports for communication with the Central Controller and with the Portable Maintenance Computer. The

Central communication line circuit shall be full duplex asynchronous data transmission, at standard baud rates between 1,200 and 38.4kbps. One of the three NTCIP-compliant RS-232 serial ports shall be available for local communications with the Portable Maintenance Computer, which shall be full duplex asynchronous data transmission, at standard baud rates between 1,200 and 38.4kbps. The communications between the sign controller and the Central Controller or Portable Maintenance Computer shall comply with the National Transportation Communications for ITS Protocol (NTCIP), as shown in Appendix A. The software to comply with the latest versions, unless otherwise stated, of the NTCIP standards. The sign controller shall support all NTCIP mandatory objects and conformance groups, and minimum storage sizes and ranges specified. In addition to the standard MIB objects, the sign shall include any manufacturer MIB objects required to support the sign and Central software functionality.

781-8 Modes of Operation:

Ensure the modes of operation determine which level of control for the SMS message selection as follows:

1. Central mode, the sign is configured for Central mode, and the Central Controller controls and monitors the sign.
2. Local mode, the sign is configured for local mode, and a Portable Maintenance Computer controls the sign locally. The Central Controller only monitors the sign (status polls).
3. Local override mode. The SMS's local mode is overridden by the Central Controller, in order to allow the Central to control the sign. This is used where the SMS was unintentionally left configured for Local mode.

781-9 Environmental Operating Criteria: Ensure the SMS is capable of operating without any decrease in performance within a temperature range of -40°C to +74°C (-40°F to +165°F), with a relative humidity of up to 100%, condensing.

781-10 Lift-Face Cabinet: The lift-face cabinet dimensions and total weight shall be as shown in this specification, or shown on the plans. The lift-face cabinet shall be weather tight. The sign cabinet finish shall be constructed of aluminum alloy 5052-H32, not less than 1/8" thick, unless otherwise specified in this document. Framing structural members shall be made of aluminum alloys 6061-T6. The equipment within the sign cabinet shall be protected from moisture, dust, dirt and corrosion. The lift-face cabinet shall meet NEMA 3R enclosure criteria as defined in NEMA Standards Publication 250-1997, *"Enclosures for Electrical Equipment (1000 Volts Maximum)"*.

781-10.1 Surface Finish: The static portion of the sign shall be fabricated using High Intensity Prismatic retro-reflective sheeting material (Series 3930), in colors meeting the 2003 MUTCD. All other surfaces shall be aluminum mill finish with no painted surfaces.

781-10.2 Welding Requirements: All welding by an inert gas process in conformance with the American Welding Society (AWS), 2003 ANSI/AWS D1.2/D1.2M Structural

Welding Code for aluminum. The Film Module SMS manufacturer's welders and welding procedures to be certified by an ANSI/AWS Certified Welding Inspector to the 2003 ANSI/AWS D1.2/D1.2M Structural Welding Code for Aluminum. Submit proof of certification of all the Film Module SMS manufacturer's welders and applicable welding procedures, including the name, phone number and address of the ANSI/AWS Certified Welding Inspector certifying the Film Module SMS manufacturer's welders and welding procedures.

781-10.3 Exterior Finish: The exterior finish of the cabinet shall be 5052-H32 aluminum alloy sheet, 0.125 inch thick minimum. The number of seams shall be kept to a minimum. All exterior seams and joints shall be sealed to form a rain tight and weather tight enclosure. The skin material shall be stitch welded to the internal structural members, to form a unitized structure.

781-10.4 Internal Structure: The interior cabinet structural members shall be 6061-T6 aluminum alloy extrusions.

781-10.5 Mounting: The cabinet shall be designed to accommodate mounting on the vertical plane on the rear of the cabinet. The exterior mounting assemblies shall be 6061-T6 aluminum alloy extrusions, 3/16 inch thick minimum.

781-10.6 Cabinet Face: There shall be no exposed fasteners or welds on the cabinet face.

781-10.7 Drain Holes: The bottom panel of the cabinet shall have a minimum of 4 drain holes, with snap-in, drain filter plug inserts, in each section formed by internal structural members. The water drain filter plug inserts shall be replaceable.

781-10.8 Lens Panel: Ensure the lens panel is a clear glazing that protects the film module material and retroreflective background assembly from the external environment.

781-10.9 Glazing: The lens panel clear glazing shall be 90% UV opaque polycarbonate G.E. Lexan XL10. The minimum required glazing properties as follows:

1. A 1/8 inch thick minimum
2. Clear in color
3. Guaranteed for ten years against yellowing, loss of light transmission and breakage
4. Tensile Strength, Ultimate: 9,500psi
5. Tensile Strain at Yield: 6%
6. Tensile Modulus: 340,000psi
7. Flexural Modulus: 340,000psi
8. Impact Strength, Izod (up to 125 mils, notched): 12-16 ft-lbs/inch
9. Rockwell Hardness: M70, R118
10. Heat Deflection Temperature Under Load: 270°F (264psi); 288°F (66psi)
11. Coefficient of Thermal Expansion: 3.75×10^{-5} in/in/°F
12. Initial Light Transmittance: 88% (average)

13. Change in Light Transmittance, five years exposure: less than 5%
14. Change in Yellowness Index, five years exposure: less than 5%

781-10.10 Cabinet Accessibility: The sign cabinet shall be front access, and stainless steel hinged at the top. Provide the sign cabinet with a single lift-face for accessibility to all internal components of the sign. All components shall be readily accessible for maintenance when the lift face is open. Use two fixed-force gas springs that easily open the lift face and hold it open at an angle of 60 degrees from vertical, capable of being opened from a bucket truck by a single person. Provide a gasket for a weather-tight seal when the lift face is closed. Use a minimum of two closure devices, one of which shall be lockable, to secure the lift face to the sign cabinet.

781-10.11 Sealed Cabinet: Ensure the cabinet is sealed, with the exception of screened drain holes at the bottom of the cabinet. The sealed cabinet is to prevent blowing water, dust, and debris from entering and collecting inside the enclosure.

781-10.12 Temperature Sensor: The cabinet will include a temperature sensor, used by the DMS Controller, to control and energize the defog and defrost heating elements.

781-10.12.1 Defog and Defrost: Provide for defogging, defrosting and condensation of the face by electrical heating method, between the glazing and the film modules. Ensure the electrical heating is controlled by the sign controller, and powered by the system's primary D.C. power source. Pencil-type or similar heating elements are not acceptable. The sign controller shall read the internal temperature sensor to turn on the heating elements, so to reduce both frost on the face of the sign, as well as condensation on the display modules and other electronic circuitry.

781-11

Film Module: The two film modules shall be easily removable from the sign cabinet and contain the following components:

1. Extruded aluminum frame
2. Mylar® Film
3. Drive motor
4. Aluminum tubes and associated bearings
5. Film guides
6. Position and limit micro switches
7. Film tensioning system, including a stainless steel tension band
8. Tracking adjustment system for film alignment
9. The film module shall be capable of displaying up to six custom speed limit values, and one blank position.

781-11.1 Film: The film shall be 0.005 inch thick, treated polyethylene terephthalate (Mylar®) polyester film, with the messages screened directly onto the film. The layout and colors of each message shall be as shown in the plans.

781-11.2 Drive Motor: The film module drive motors shall be 12Vdc motors.

781-11.3 Micro switches: Position-sensing switches shall be sealed, single-pole, double-throw micro switches, with gold-plated contacts that are rated at 0.1A @ 30Vdc, from -40°C to +74°C (-40°F to +165°F). Limit-sensing switches shall be single-pole, double-throw micro switches, with silver-plated contacts that are rated at 11A @ 30Vdc, from -40°C to +74°C (-40°F to +165°F).

781-12

Power: Ensure the power source and the sign controller is a single solar cell panel, with battery backup integral to this system and the internal D.C. power bus. The presence of power transients or electromagnetic fields, including those created by any components of the system, shall have no adverse effect on the performance of the system. The system shall not conduct or radiate signals, which will adversely affect other electrical or electronic equipment including, but not limited to, other control systems, data processing equipment, audio, radio and industrial equipment.

781-13

Internal Power Bus and 48 hour Battery Backup: Ensure the system's internal power bus consists of a professional-grade solar panel and solar charge controller set, in conjunction with two Alpha Technologies 210 GXL AGM batteries. These components are for a 48-hour Battery Backup for the entire SMS system, including the anti-fog heat components, and operating the sign during day and night. This system shall provide sufficient power for the sign to operate for a minimum of 48 continuous hours, under the following conditions:

1. Film module message changes for 15 minutes
2. The operating temperature range of -40°C to +60°C
3. The defog and defrost heating elements are on
4. The solar charge controller and batteries shall be located in an external, ground-mounted cabinet
5. The voltage to the drive motors shall not exceed 17Vdc.

781-14

Solar Power Subsystem: The system shall include a solar cell power source. This power source subsystem shall consist of one 12V, 125W solar panel, manufactured by B-P, Model No. BP 3125, and one Morningstar "ProStar" PS-30 Solar Charge Controller. The solar power source shall be capable of simultaneously powering the system and charging the batteries during daylight hours, with the battery backup batteries providing power for up to 48 continuous hours with a full charge. The solar cell panel shall be mounted to the ground-mount battery cabinet, the SMS's sign support structure, or a separate pole structure, with interconnecting cable to the battery cabinet as required by the NEC.

781-14.1 Batteries: The batteries shall be 12V, sealed, deep cycle, zero-maintenance, absorbed glass mat batteries. They shall feature pressure regulated, non-removable safety vent valves. Under any charging conditions, the batteries shall produce low amounts of

hydrogen gas under all operational conditions.

781-14.2 Monitoring the Batteries: The voltage of the system's two batteries shall be continuously monitored by the sign controller, and algorithm to estimate the remaining total battery life. The sign controller will report this estimate to the Central controller, or laptop computer, upon being polled. When a battery's voltage drops below a critical value, the condition shall be reported on the next poll.

781-14.3 Battery Cabinet: The battery cabinet shall be a 1/8 inch fully welded aluminum 336 series cabinet, containing the following:

1. Two full size doors, one door on the front, and one door on the rear
2. A 100 CFM fan and thermostatic control
3. A three-point locking system with Corbin locks and stainless steel handles
4. A two-position bar stop on the bottom of each door
5. A removable self-standing 19 inch rack assembly
6. A solar charge controller
7. A shelf, as many as needed to accommodate the batteries
8. Two batteries
9. The battery backup system operation within the environmental ranges listed

781-14.4 Sign to Battery Cabinet Interconnection: Ensure cables between the sign and the battery backup cabinet are provided for the operation of the sign. Signal control and data cables are to be multiple stranded, twisted pairs, 300 V dielectric, shielded cable. The power cable interconnections are to be 300 V rated, and sized for the current. The A.C. power cables are to be routed to the sign enclosure through conduit that is separate from D.C. power and control and data cables.

781-15 Surge Protection: Provide surge protection for the communications lines to this system by a UL497A listed, self-contained device that provides the following protection characteristics:

1. Rated for 200Vac operating voltage
2. Provides two-stage protection
3. Tested to IEC 61000-4-5 EMC surge standard
4. Tested to CCITT K17 communications surge standard
5. Integral RJ11/RJ45 connector
6. A 3kA surge current capability
7. A -40° F to +185° F operating range
8. A 95% relative humidity RH (non-condensing) operating range

781-16 Transient Test Requirements:

The sign cabinet electronics and the control cabinet shall be separately capable of withstanding a high-energy transient repeatedly applied to the incoming power terminals, having the following characteristics. A 10µF oil-filled capacitor, charged to 1kVdc ±5% shall be discharged into the incoming power terminals, a minimum of three times for each polarity. Immediately following

this test, the unit under test shall perform all of its defined functions upon the restoration of normal incoming power.

781-17 Sign Monitoring Functions: Ensure the SMS, including sign hardware, controller firmware and controller software is capable of reporting errors and failures, including:

1. Incoming Power failure
2. Film module failure
3. Temperature overheating
4. Airflow failure
5. Solar charge controller failure
6. Battery failure
7. Message and status monitoring

781-17.1 Message Functions: Ensure the sign controller responds to the Central controller when it receives a request for status (a poll). The return message shall be capable of providing the following information:

1. Present film module message position
2. Control mode; Central, Local or Local Override modes
3. Temperature measurement
4. Origin of display message; Central, laptop or sign controller)
5. Defog and defrost heating elements status
6. Battery charger status
7. Severe error condition response
8. In dial-up mode, the sign controller shall initiate a call to the Central controller and report any severe error conditions
9. In multi-drop mode, the sign controller shall report severe error conditions to the Central controller upon the next poll

781-17.2 Error Conditions: The severe error conditions are as follows:

1. Both batteries failed
2. Each time the sign controller is polled by the Central Controller or Portable Maintenance Computer, the sign controller shall test the operational status of the following sensors, and return this information to the Central Controller. This operational status test shall determine if each of the following sensors are functioning properly:
 1. Temperature sensor
 2. Battery voltage sensors

781-17.3 Failure Functions: In the event the Central controller fails to communicate with the sign controller within a programmable time limit, the sign shall activate a programmable default message, which can be selected to be the "blank" message. This

function shall apply only when the sign controller is in the Central mode. Failure of any sign shall not affect the operation of any other sign in the system. The sign controller shall perform a consistency check of messages downloaded from the Central controller or Portable Maintenance Computer, in order to ensure that the message will fit in the sign's display area. If any part of the message fails this check, the downloaded message shall not be displayed. The sign controller internal time clock shall ensure that the correct message is displayed at the correct time, even in the event of a communications loss. The sign controller shall maintain its internal time clock during power outages of less than 255 minutes, and display the proper message when power is restored. The sign controller shall be capable of a remote reset from the Central controller.

781-17.4 Temperature and Condensation: The SMS sign system equipment shall successfully perform all the functionality requirements listed in the specification, under the following conditions, and in the order specified below.

1. The equipment shall be temperature stabilized at -40°F (-40°C). After stabilization, the equipment shall be operated without degradation of operating characteristics, as defined in this specification, for two hours; then,
2. Moisture shall be condensed on the equipment by allowing it to warm up to room temperature in an atmosphere having relative humidity of at least 40%, followed by the equipment satisfactorily operating for two hours while wet; then,
3. The equipment shall be stabilized at 165°F (74°C). Upon stabilization, the equipment shall be satisfactorily operated for two hours without degradation of operating characteristics, as defined in this specification, or experiencing operational failures.

781-17.5 Primary Power Variation: The equipment shall meet the specified performance requirements when the nominal input voltage is $115 \pm 15\text{Vac}$. The equipment shall be operated at these voltage limits for at least 15 minutes, during which the operational portion of the FDT shall be successfully performed.

781-17.6 Power Service Transients: The equipment shall meet the performance requirements specified, when subjected to the power service transient specified in NEMA TS-4 Section 2.1.6, "Transient, Power Service".

781-17.7 Relative Humidity: The equipment shall meet the performance requirements specified, when subjected to a temperature range of 40°F to 110°F (4.4°C to 43.3°C), and a relative humidity not to exceed 95% non-condensing, specified in NEMA TS-4 Section 2.1.5.2, "Humidity".

781-17.8 Vibration: The equipment (excluding cabinets) shall show no failure to the mechanical structure, soldered components, or plug-in components, and shall operate in accordance with the manufacturer's equipment specifications after being subjected to the vibration tests described in NEMA TS-4 Section 2.2.5, "Vibration Test".

781-18 Technical Assistance:

The SMS manufacturer's technical representative shall provide telephone technical assistance for the following areas:

1. Sign cabinet to ground control cabinet cable termination
2. Initial sign turn on and stand alone test

781-19 Documentation:

Supply the software and firmware with full documentation, including 3.5" floppy disks and CD-ROM containing ASCII versions of the following Management Information Base (MIB) files in Abstract Syntax Notation 1 (ASN.1) format. The relevant version of each official NEMA Standard MIB Module referenced by the device functionality. If the device does not support the full range of any given object within a NEMA Standard MIB Module, a manufacturer specific version of the official NEMA Standard MIB Module with the supported range indicated in ASN.1 format in the SYNTAX field of the OBJECT-TYPE macro. The filename shall be the same as the standard MIB filename with the extension ".man". Any manufacturer-specific objects supported by the device in a manufacturer specific MIB with accurate and meaningful "description" fields and supported ranges indicated in the "syntax" field of the "object type" macros.

781-20 Method of Measurement:

The Film Module SMS is for each unit that successfully passed the FDT, delivered and inspected in accordance with this specification.

781-21 Basis of Payment:

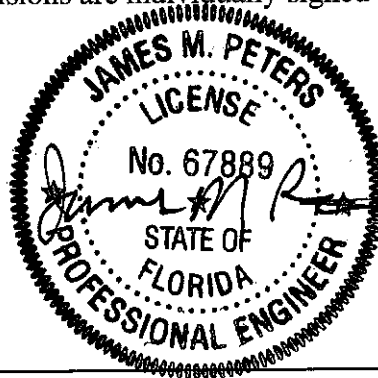
The work performed, and materials furnished, in accordance with this Item, and measured as provided under "Method of Measurement", shall be paid for at the unit price bid for "SINGLE POST WITH SCROLLING MYLAR SIGN". This price shall be full compensation for furnishing, installing and testing all materials and equipment, and for all tools, labor, equipment, hardware, operational software packages, supplies, support, personnel training, shop drawings, documentation and incidentals necessary to complete the work.

Payment will be made under:

Item No. 700-20-19 SINGLE POST WITH SCROLLING MYLAR SIGN -Each

**TECHNICAL SPECIAL PROVISIONS
FOR
CCTV CAMERA**

The following Technical Special Provisions are individually signed and sealed but are included as part of this Specifications Package.



Prepared By: James M. Peters, P.E
Florida Registration No. 67889
Date: January 17, 2011
Pages: 103 through 108

SECTION 782
INTELLIGENT TRANSPORTATION SYSTEMS
VIDEO EQUIPMENT – CCTV CAMERA

782-1 CCTV CAMERA.

782-1.1 Description. Furnish, install, configure, and test all materials and equipment necessary to complete the CCTV Camera installation in accordance with the plans, the FDOT Standard Specifications, and these Technical Special Provisions. Furnish and install a closed-circuit television (CCTV) camera at the locations shown on the plans. Ensure that the installed equipment provides unobstructed video images of the roadway, traffic, and other current conditions around a roadside CCTV field site; that it responds to camera control signals from the operator; and that the video images can be transmitted to remote locations for observation.

782-1.2 Materials:

782-1.2.1 Camera: Furnish an IP CCTV camera that is compatible with the City of Ocala communication network, and any camera operating software indicated on the plans or in the contract documents.

Ensure that the camera produces National Television System Committee (NTSC) composite video output of 1 volt peak-to-peak (Vp-p) at 75 ohms (Ω). In addition, ensure the camera provides the following features and capabilities:

1. IP camera dome camera with interchangeable modules for the CPU, camera, housing, communications, and power supply, which will provide the ability to adapt a camera system to changing needs quickly and economically.
2. Ability to support high-performance PTZ day and night function.
3. Image stabilization feature to eliminate movement caused by unstable camera mounts.
4. Ability to support video and data transmission using TCP/IP protocol over Ethernet.
5. Privacy masking functionality that allows for programming of complex shapes smoothly and quickly-ensuring that the covered object cannot be seen.
6. Capable of using the latest MPEG-4 compression technology to provide DVD-quality 4CIF video at frame rates up to 25/30 PAL/NTSC images per second.
7. Tri-streaming video feature to generate two independent MPEG-4 streams and a JPEG stream simultaneously.

782-1.2.2 Lens: Ensure that the CCTV camera will have a 36X (3.4-122.4 mm) day and night PTZ motorized optical zoom with automatic iris with manual override. The focus shall be automatic, but includes manual override. Other related features shall be as listed below.

1. Imager: 1/4 inch Exview HAD CCD (752x582 PAL)/(768x494 NTSC)
2. Lens: F1.6 to F4.5
3. Field of view: 1.7° to 57.8°
4. Video Output: 1.0 Vp-p, 75 Ohm
5. Gain Control: Off/Auto (with adjustable limit)

6. Aperture Correction: Horizontal and vertical
7. Digital Zoom: 12x
8. Horizontal Resolution: 540 TVL (NTSC, PAL) typical
9. Electronic Shutter Speed: 1 to 1/10,000
10. SNR: > 50 db
11. White Balance: 2000 K to 10,000 K

782-1.2.4, 782-1.2.5 & 782-1.2.6 Pan/Tilt Mechanism, Mechanical &

Electrical: Ensure that the total weight of the camera (including the housing, sunshield, and all internal components) is less than 10 lb. Ensure that the camera provides a continuous pan range of 360° with a tilt angle of 18° above horizon and with a variable speed range of 0.1°/s to 120°/s. Ensure the power for the camera is 21-30 VAC with 50/60 Hz.

Surge Suppression:

1. Protection on video: Peak current 10 kA, peak power 1000W (10/1000 μ)
2. Protection on relay outputs: peak current 7.3 A, peak power 600W (10/1000 μ)
3. Protection on power input (dome): peak current 7.3 A, peak power 600W (10/1000 μ)
4. Protection on power output (arm power supply): peak current 21.4 A, peak power 1500W (10/1000 μ)

782-1.2.7 Communication: Ensure that the CCTV camera supports communication protocols such as TCP/IP, Biphase, Pelco P and Pelco D. Make sure the TCP/IP module is capable of providing complete network-based control of all dome functionality including pan/tilt/zoom operation, presets and tours as well as web-based configuration of all dome settings.

Ensure there are at least 50 prepositions with 16-character titles. Ensure that the camera support two types of tours, recorded and preset. At least one recorded tour with a total duration of 15 minutes. Ensure that there is at least one present tour consisting of at least 50 scenes, consecutively, and one customized up to at least 50 scenes. Ensure that the camera provides at a minimum of two supporting languages, English and Spanish. Ensure that the CCTV camera supports the communication links shown on the plans.

782-1.2.8 Environmental Specifications: Ensure that the CCTV camera performs all required functions within an ambient operating temperature range of -30°F to 122°F and shall withstand storage temperature range of -30°F to 140°F. The camera shall operate normally when subjected to a relative humidity range of 0% to 100%, condensing. Verify that the CCTV camera manufacturer certifies its device has successfully completed environmental testing as defined in the environmental requirements section of the NEMA TS 2 standard.

782-1.3 Installation Requirements: Install CCTV cameras in the field on existing and proposed poles at roadside locations as per the plans. The proposed poles shall be pre-stressed concrete poles 46' high and weigh 4691 lb. Design, furnish, and install the pole according to the requirements of FDOT Standard Specification, Section 785, and, as depicted in the FDOT Design Standards.

Furnish and install the power supplies, local control equipment and any other camera related field electronic equipment, and transient voltage surge suppressors within the existing base-mounted traffic control cabinet as shown on the plans. The power to the cameras shall be tapped from the power outlets in the existing traffic control cabinets. Use Ethernet UV rated shielded cable (CAT-5e) for video/control of the cameras with length of cables as shown on the plans. Use 6 wire/ 18 gauge shielded cable for powering the cameras. Use wire size (AWG#) of the copper cable as shown on the plans. Both power and video/control cables to be encapsulated in 1 pvc UV rated cable. Use field hardened luminaire brackets for mounting cameras to existing or proposed poles as shown on the plans.

Provide a pole mounted cabinet (type 336) to the camera when the distance between the camera to the field Ethernet switch (housed in the existing traffic control cabinet), is more than 328 ft. Install camera cables through this pole mounted cabinet to the existing traffic control cabinet as per the plans. Install TVSS for camera cables in the pole mounted cabinet. Install an Ethernet extender to enable passage of uninterrupted data and control transmission between the CCTV camera and field Ethernet switch. The cost for furnishing, installing and testing the Ethernet extender is included under the cost for the CCTV camera. The specification for Ethernet extender is as follows.

782-1.3.1 Ethernet Extender:

Ensure the Ethernet extender supports extension of the Ethernet cable for data and control transmission by at least a distance of 700 ft. (beyond the 328 ft. limitation), for a 24V Ethernet device, at a 100 Mbps data transfer rate. Provide an Ethernet extender that is capable of extending data line over CAT 5e wiring. Ensure the extender supports LAN device such as a switch, router, gateways and end nodes. Ensure the extender is easily installed (no programming required) using RJ-45 LAN interface and cabling. Let the extender equipment be network equipment independent and therefore transparent to protocols/applications. Ensure that the Ethernet extender can be installed quickly with no programming and no firmware to upgrade.

Ensure that the extender consists of a CPE unit and a CO unit to transmit data and control beyond restricted 328 ft. Ensure the extender unit comes with an AC/DC power adaptor and LAN patch cables for making connections to the LAN switch. Install the CPE unit in the pole mounted cabinet and the CO unit in the existing traffic control cabinet. Use CAT 5e (4-pairs/8 wires) to crimp a RJ-45 Male Head to each end of the contiguous wire run and using the pins (1 & 2) straight through. Make sure this will deliver Ethernet data over the required distance. Insert the completed RJ-45 ends into the Interlink port on each unit (CPE & CO). Attach the remote Ethernet device (CCTV Camera) to the CPE unit LAN port using an Ethernet patch cord. Attach local LAN to the CO unit's LAN port with an Ethernet patch cord. Ensure that the power adaptor is attached to the CO unit. Other key Ethernet extender related specifications are listed below.

Functionality:

1. Data Rates up to 100 Mbps Full Duplex
2. Full Duplex/Half Duplex status/Collisions
3. Protocol Independent

Indicators:

1. Power Indicator
2. 100 Mbps Link status/Activity
3. VDSL2 Link Status/Activity

Interfaces:

1. 5v DC power Adaptor CO unit
2. RJ-45 100 MB LAN Auto negotiate

Environment:

3. Operating temp. : -20°C to 70°C/-4°F-160°F
4. Storing temp. : -25°C to 70°C/-13°F -160°F
5. Humidity 5% to 95%, non-condensing

782-1.3.2 Outside Plant (OSP) Cable

Broad Band (BBD) Category 5e Outside Plant cables are designed to provide extension of the Local Area Network beyond the premises. The core is filled with PFM thixotropic filling compound or equivalent to prevent water ingress. PFM gel will not drip at elevated temperatures. All designs are suitable for buried application.

Key OSP cable specifications are listed below.

Pair Count: 4

Conductor: Solid annealed copper

AWG (mm): 24 (.51)

Filling Compound: PFM thixotropic gel or equivalent

Insulation: Solid polyolefin

Shield: Broad Band Enhanced (BBDE): Unshielded

Broad Band Non Enhanced (BBDNE): Electrically continuous .008 in (.20 mm) polymer coated smooth aluminum tape, applied with an overlap

BBDGE: Electrically continuous .005 in (.13 mm) corrugated copper-clad armor, applied with an overlap shield and flooded with a flooding compound.

Jacket: Black, sunlight and weather resistant polyethylene

Characteristic Impedance(Ohms): 100+-15

Nominal Velocity of Propagation(%): 62

Standards Compliance: ANSI/TIA/EIA-568-B.2

ANSI/TIA-568-C.2

ANSI/ICEA S-107-704-2006

RoHS-compliant

782- 2 Method of Measurement

782-2.1 General: Measurement for payment will be in accordance with the following task.

782-2.2 Furnish and Install: The Contract unit price for each CCTV camera furnished and installed, will include furnishing, placement, and testing of all equipment and materials including all camera cables, Ethernet extender units, TVSS for camera cables, pole mounted cabinet, camera mounting arm/bracket and for all tools, labor, operational software package(s) and firmware(s), supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

782-3 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section. Payment will be made under:

Item No. 782-1-11 CCTV CAMERA - Each.

**THIS COMPLETES
THIS
SPECIFICATIONS
PACKAGE**