



**INVITATION FOR BID
(IFB) #11-2454-OV
Cortez Road (SR 684) @ 43rd Street West
Installation of Mast Arm Signals (FM #425530-1)
Bradenton, FL (Project #6076860/ 6.2)**

Manatee County, a political subdivision of the State of Florida, (hereinafter the "County") will receive sealed bids from individuals, corporations, partnerships, and other legal entities organized under the laws of the State of Florida or authorized to conduct business in the State of Florida.

INFORMATION CONFERENCE

In order to insure that all prospective bidders have sufficient information and understanding of the County's needs, an Information Conference will be held on **January 26, 2012 at 10:30 AM at the Manatee County Public Works Department, Project Management Division, (Conference Room A) at 1022 26th Avenue East, Bradenton, FL 34208.** Attendance is not mandatory, but is highly encouraged.

Reference Bid Article B.04 INSPECTION OF SITE:

Prior to submission of a bid, each bidder shall visit the site to become familiar with all conditions that may affect services that are required to completely execute the full intent of these specifications. Site visit shall be acknowledged in Section 00300, Bid Form, page 00300-1.

DEADLINE FOR CLARIFICATION REQUESTS: February 2, 2012 @ 5:00 PM
(Reference Bid Article A.06)

TIME AND DATE DUE: February 16, 2012 @ 2:00 PM
Manatee County Purchasing, 1112 Manatee Avenue West, Bradenton, FL 34205

Important Note: Lobbying is prohibited (reference Bid Article A.08)

FOR INFORMATION CONTACT:

Olga Valcich (941) 708-7527

Olga.valcich@mymanatee.org

AUTHORIZED FOR RELEASE: 

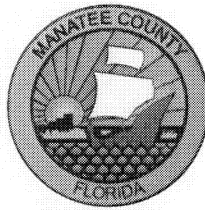


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00700 General Conditions	00700-1- 19
FDOT Supplemental LAP Conditions (Construction Contract).....	61 Total Pages
(Including Attachment "A" Federal-Aid EEO Requirements	
Specification Package (Signed and Sealed 2/25/2011).....	281 Total Pages
Technical Special Provisions for Video Vehicle Detector Assembly.....	11 Total Pages
(Signed and Sealed 2/25/2011)	
Technical Special Provisions for Uninterruptible Power Source.....	7 Total Pages
(Signed and Sealed 2/25/2011)	
Plans Cortez Road @ 43 rd Street West.....	12 Total Pages
(Signed and Sealed 2/25/2011)	

SECTION 00010
INFORMATION TO BIDDERS

A.01 OPENING LOCATION

These bids will be **publicly opened** at **Manatee County Purchasing, 1112 Manatee Avenue West, Suite 803, Bradenton, Florida 34205** in the presence of County officials at the time and date stated, or soon thereafter. All bidders or their representatives are invited to be present.

Any bids received after the stated time and date will not be considered. It shall be the sole responsibility of the bidder to have their bid **delivered to the Manatee County Purchasing Division** for receipt on or before the stated time and date. If a bid is sent by **U.S. Mail**, the bidder shall be responsible for its timely delivery to the Purchasing Division. Bids delayed by mail shall not be considered, shall not be opened at the public opening, and arrangements shall be made for their return at the respondent's request and expense.

A.02 SEALED & MARKED

One original and two copies of your **signed bid** shall be submitted in one **sealed package**, clearly marked on the outside **"Sealed Bid #11-2454-OV, Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals, Bradenton, FL**

Address package to: Manatee County Purchasing Division
1112 Manatee Avenue West, Suite 803
Bradenton, Florida 34205

A.03 SECURING OF DOCUMENTS

Complete individual copies of the bidding documents for the project and/or products can be obtained, free of charge, at the Manatee County Public Works Department located at: 1022 26th Avenue East, Bradenton, FL 34208: **941-708-7450, Extension 7327 or 7334** between the hours of 8:00 AM to 4:00 PM, Monday through Friday, exception of holidays. Complete set of the bidding document must be used in preparing bids. The County assumes no responsibility for errors and misinterpretations resulting from the use of incomplete sets of bidding document.

A.04 BID DOCUMENTS

Bids on **<http://www.mymanatee.org>** , Bid documents and the Notices of Source Selection related to those Bids are available for download in a portable document format (.PDF) file on the Manatee County web page on the Purchasing tab under "Bids." You may view and print these files using Adobe Acrobat software. You may download a free copy of this software (Adobe) from the County's web page if you do not have it. **Manatee County collaborates with the Manatee Chamber of Commerce** on distributing solicitations using the RFP Tool web page on the Chambers website: **<http://www.Manateechamber.com>** to post Bid documents in a portable document

A.04 BID DOCUMENTS (Continued)

format (.PDF) file. This step is in addition to the posting on Manatee County Government web pages.

Manatee County may also use an internet service provider to distribute Bids. A link to that service, <http://www.DemandStar.com>, is provided on this website under the Tab "DemandStar". Participation in the DemandStar system is not a requirement for doing business with Manatee County.

Note: The County posts the Notice of Source Selection seven calendar days prior to the effective date of the award.

IT IS THE RESPONSIBILITY OF EACH VENDOR, PRIOR TO SUBMITTING THEIR BID, TO CONTACT THE MANATEE COUNTY PURCHASING OFFICE (see contact information on page one of this document) TO DETERMINE IF ADDENDA WERE ISSUED AND TO MAKE SUCH ADDENDA A PART OF THEIR BID .

A.05 MODIFICATION OF BID SPECIFICATIONS

If a bidder wishes to recommend changes to the bid specifications, the bidder shall furnish in writing, data and information necessary to aid the County in evaluating the request to modify the specifications. The County is not obligated to make any changes to the bid specifications. Unless an addendum is issued, the bid specifications shall remain unaltered. **Bidders must fully comply with the bid specifications, terms, and conditions.**

A.06 DEADLINE FOR CLARIFICATION REQUESTS

February 2, 2012 at 5:00 pm shall be the deadline to submit all inquiries, suggestions, or requests concerning interpretation, clarification or additional information pertaining to the Invitation for Bids to the Manatee County Purchasing Office.

This deadline has been established to maintain fair treatment for all potential bidders, while maintaining the expedited nature of the Economic Stimulus that the contracting of this work may achieve.

A.07 CLARIFICATION & ADDENDA

Each bidder shall examine all Invitation for Bids documents and shall judge all matters relating to the adequacy and accuracy of such documents. Any inquiries, suggestions or requests concerning interpretation, clarification or additional information pertaining to the Invitation for Bids shall be made through the Manatee County Purchasing Office. The County shall not be responsible for oral interpretations given by any County employee, representative, or others. The issuance of a written addendum is the only official method whereby interpretation, clarification or additional information can be given.

A.09 UNBALANCED BIDDING PROHIBITED (Continued)

presumptive unbalanced bids where the bidder is unable to demonstrate the validity and/or necessity of the unbalanced unit costs.

A.10 FRONT END LOADING OF BID PRICING PROHIBITED

Prices offered for performance and/or acquisition activities to occur early in the project schedule, such as: mobilization, clearing and grubbing; or maintenance of traffic, that are substantially higher than pricing of competitive bidders within the same portion of the project schedule, will be presumed to be front end loaded. Front end loaded bids could reasonably appear to be an attempt to obtain unjustified early payments creating a risk of insufficient incentive for the Contractor to complete the work or otherwise creating an appearance of an under-capitalized bidder.

In the event the County determines that a bid is presumed to be front end loaded, it will request the opportunity to, and reserves the right to, review all source quotes, bids, price lists, letters of intent, etc., which the bidder obtained and upon which the bidder relied upon to develop the pricing or acquisition timing for these bid items. The County reserves the right to reject as non-responsive any presumptive front end loaded bids where the bidder is unable to demonstrate the validity and/or necessity of the front end loaded costs.

A.11 WITHDRAWAL OF OFFERS

Vendors may withdraw offers as follows: a) Mistakes discovered before the opening of a solicitation may be withdrawn by written notice from the bidder submitting the offer. This request must be received in the office designated for receipt of offers in the solicitation document prior to the time set for delivery and opening of the offers. A copy of the request shall be retained and the unopened offer returned to that vendor. b) After the responses to a solicitation are opened or a selection has been determined, but before a contract is signed, a vendor alleging a material mistake of fact may be permitted to withdraw their offer if: (1) the mistake is clearly evident on the solicitation document; or (2) the bidder submits evidence which clearly and convincingly demonstrates that a mistake was made. Request to withdraw and offer must be in writing and approved by the Purchasing Official.

A.12 IRREVOCABLE OFFER

Any bid may be withdrawn up until the date and time set for opening of the bid. Any bid not so withdrawn shall, upon opening, constitute an irrevocable offer for a period of 90 days to sell to Manatee County the goods or services set forth in the attached specifications until one or more of the bids have been duly accepted by the County.

A.13 BID EXPENSES

All expenses for making bids to the County are to be borne by the bidder.

A.14 RESERVED RIGHTS

The County reserves the right to accept or reject any and/or all bids, to waive irregularities and technicalities, and to request resubmission. Also, the County reserves the right to accept all or any part of the bid and to increase or decrease quantities to meet additional or reduced requirements of the County. Any sole response received by the first submission date may or may not be rejected by the County depending on available competition and current needs of the County. For all items combined, the bid of the lowest responsive, responsible bidder will be accepted, unless all bids are rejected. The lowest responsible bidder shall mean **that bidder who makes the lowest bid to sell goods and/or services of a quality which** conforms closest to or most exceeds the quality of goods and/or services set forth in the attached specifications or otherwise required by the County, and who is fit and capable to perform the bid as made.

To be responsive, a bidder shall submit a bid which conforms in all material respects to the requirements set forth in the Invitation For Bid. To be a responsible bidder, the bidder shall have the capability in all respects to perform fully the contract requirements, and the tenacity, perseverance, experience, integrity, reliability, capacity, facilities, equipment, and credit which will assure good faith performance. Also, the County reserves the right to make such investigation as it deems necessary to determine the ability of any bidder to furnish the service requested. Information the County deems necessary to make this determination shall be provided by the bidder. Such information may include, but shall not be limited to: current financial statements, verification of availability of equipment and personnel, and past performance records.

A.15 APPLICABLE LAWS

Bidder must be authorized to transact business in the State of Florida. All applicable laws and regulations of the State of Florida and ordinances and regulations of Manatee County will apply to any resulting agreement. Any involvement with any Manatee County procurement shall be in accordance with Manatee County Purchasing Code of Laws as amended. Any actual or prospective bidder who is aggrieved in connection with the solicitation or award of a contract may protest to the Board of County Commissioners of Manatee County as required in Section 2-26/61 of the Purchasing Code.

A protest with respect to this Invitation For Bid shall be submitted in writing prior to the scheduled opening date of this bid, unless the aggrieved person did not know and could not have been reasonably expected to have knowledge of the facts giving rise to such protest prior to the scheduled opening date of this bid. The protest shall be submitted within seven calendar days after such aggrieved person knows or could have reasonably been expected to know of the facts giving rise thereto.

A.16 COLLUSION

By offering a submission to this Invitation For Bid, the bidder certifies that he has not divulged, discussed or compared their bid with other bidder, and has not colluded with any other bidder or parties to this bid whatsoever. Also, bidder certifies, and in the case

A.16 COLLUSION (Continued)

of a joint bid each party thereto certifies as to their own organization, that in connection with this bid:

- a. any prices and/or cost data submitted have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices and/or cost data, with any other bidder or with any competitor;
- b. any prices and/or cost data quoted for this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder, prior to the scheduled opening, directly or indirectly to any other bidder or to any competitor;
- c. no attempt has been made or will be made by the bidder to induce any other person or firm to submit or not to submit a bid for the purpose of restricting competition;
- d. the only person or persons interested in this bid, principal or principals is/are named therein and that no person other than therein mentioned has any interest in this bid or in the contract to be entered into; and
- e. no person or agency has been employed or retained to solicit or secure this contract upon an agreement or understanding or a commission, percentage, brokerage, or contingent fee excepting bona fide employees or established commercial agencies maintained by bidder for purpose of doing business.

A.17 CODE OF ETHICS

With respect to this bid, if any bidder violates or is a party to a violation of the Code of Ethics of Manatee County per Manatee County Code of Law, Chapter 2-26, Manatee County Purchasing Ordinance, Article 3, Ethics in Public Contracting, and/or the State of Florida per Florida Statutes, Chapter 112, Part III, Code of Ethics for Public Officers and Employees, such bidder may be disqualified from performing the work described in this bid or from furnishing the goods or services for which the bid is submitted and shall be further disqualified from submitting any future bids for work or for goods or services for Manatee County. The County anticipates that all statements made and materials submitted in a bid will be truthful. If a bidder is determined to be untruthful in its bid or any related presentation, such bidder may be disqualified from further consideration regarding this Invitation For Bid.

A.18 BID FORMS

Bids must be submitted on attached County forms, although additional pages may be attached. **Bidders must fully complete all pages of the Bid Forms for both Bid A and Bid B. Bid Forms must be executed by an authorized signatory who has the legal authority to make the offer and bind the company. Bidders must fully comply with all specifications, terms and conditions.** Failure to comply shall result in contract default, whereupon, the defaulting vendor shall be required to pay for any and all re-procurement costs, damages, and attorney fees as incurred by the County.

A.19 LEGAL NAME

Bids shall clearly indicate the legal name, address and telephone number of the bidder. Bids shall be signed above the typed or printed name and title of the signer. The signer must have the authority to bind the bidder to the submitted bid.

A.20 DRUG FREE WORK PLACE

The Manatee County Board of County Commissioners adopted a policy regarding bidders maintaining a Drug Free Work Place, prohibiting the award of bids to any person or entity that has not submitted written certification to the County that it has complied with those requirements. A Drug Free Work Place Certification Form is attached to this bid for this purpose.

A.21 BE GREEN

All Bidders are encouraged to use as many environmentally preferable "green" products, materials, supplies, etc. as possible in order to promote a safe and healthy environment. Environmentally preferable are products or services that have a reduced adverse effect on the environment. Provide detail of your organization's initiative and its ability to meet the goal of environmental sustainability

A.22 PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES

A person or affiliate who has been placed on the State's convicted vendor list following a conviction for a public entity crime, as that term is defined in Florida Statute § 287.133, may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; 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 Florida Statute § 287.017 for CATEGORY TWO for a period of 36 months following the date of being placed on the convicted list.

In addition, the Manatee County Code prohibits the award of any contract to any person or entity who/which has, within the past 5 years, been convicted of, or admitted to in court or sworn to under oath, a public entity crime or of any environmental law that, in the reasonable opinion of the purchasing official, establishes reasonable grounds to believe the person or business entity will not conduct business in a responsible matter. To insure compliance with the foregoing, the Code requires all persons or entities desiring to contract with the County to execute and file with the purchasing official an affidavit, executed under the pain and penalties of perjury, confirming that person, entity

A.07 CLARIFICATION & ADDENDA (Continued)

If any addenda are issued to this Invitation for Bid, the County will Broadcast the addenda on the Demand Star distribution system to "Planholders" on this web service, and post the documents on the Purchasing Division's web page at <http://www.mymanatee.org> which can be accessed by clicking on the "Purchasing" button and then clicking on the "Bids" button. It shall be the responsibility of each bidder, prior to submitting their bid, to contact Manatee County Purchasing (see contact on page 1) to determine if addenda were issued and to make such addenda a part of their bid.

A.08 LOBBYING

After the issuance of any Invitation For Bid, prospective bidders, or any agent, representative or person acting at the request of such bidder shall not contact, communicate with or discuss any matter relating in any way to the Invitation For Bid with any officer, agent or employee of Manatee County other than the Purchasing Director or as directed in the Invitation For Bid. This prohibition begins with the issuance of any Invitation For Bid, and ends upon execution of the final contract or when the invitation has been canceled. Violators of this prohibition shall be subject to sanctions as provided in the Manatee County Purchasing Code.

The County reserves the right to amend or to add to the names listed as persons to contact. All amendments or additions to the names listed as persons to contact shall be issued by the Purchasing Division, in writing.

A.09 UNBALANCED BIDDING PROHIBITED

Manatee County recognizes that large and/or complex projects will often result in a variety of methods, sources and prices; however, where in the opinion of the County such variation does not appear to be justified, given bid specifications and industry and market conditions, the bid will be presumed to be unbalanced. Examples of unbalanced bids will include:

1. Bids showing omissions, alterations of form, additions not specified or required conditional or unauthorized alternate bids.
2. Bids quoting prices that substantially deviate, either higher or lower, from those included in the bids of competitive bidders for the same line item unit costs.
3. Bids where the unit costs offered are in excess of or below reasonable cost analysis values.

In the event the County determines that a bid is presumed unbalanced, it will request the opportunity to, and reserves the right to, review all sources quotes, bids, price lists, letters of intent, etc., which the bidder obtained and upon which the bidder relied upon to develop the bid. The County reserves the right to reject as non-responsive any

A.22 PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES (Continued)

and any person(s) affiliated with the entity, does not have such a record and is therefore eligible to seek and be awarded business with the County.

In the case of a business entity other than a partnership or a corporation, such affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, such affidavit shall be executed by the general partner(s). A Public Contracting and Environmental Crimes Certification is attached for this purpose.

A.23 DISCOUNTS

Any and all discounts must be incorporated in the prices contained in the bid and not shown separately. The prices as shown on the bid form shall be the price used in determining award.

A.24 TAXES

Manatee County is exempt from Federal Excise and State Sales Taxes. (F.E.T. Exempt Cert. No. 59-78-0089K; FL Sales Tax Exempt Cert. NO 85-8012622206C-6); therefore, the vendor is prohibited from delineating a separate line item in his bid for any sales or service taxes. Nothing herein shall affect the vendor's normal tax liability.

A.25 DESCRIPTIVE INFORMATION

Unless otherwise specifically provided in the specifications, all equipment, materials and articles incorporated in the work covered by this contract shall be new and of the most suitable grade for the purpose intended. Unless otherwise specifically provided in the specifications, reference to any equipment, material, article or patented process, by trade name, brand name, make or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition.

A.26 AMERICANS WITH DISABILITIES ACT

The Board of County Commissioners of Manatee County, Florida, does not discriminate upon the basis of any individual's disability status. This non-discrimination policy involves every aspect of the County's functions including one's access to, participation, employment, or treatment in its programs or activities. Anyone requiring reasonable accommodation for an **Information Conference** or **Bid Opening** should contact the person named on the first page of this bid document at least twenty-four (24) hours in advance of either activity.

A.27 EQUAL EMPLOYMENT OPPORTUNITY CLAUSE

Manatee County, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 and the Regulations of the Department of Commerce (15 CFR, Part 8) issued pursuant to such Act, hereby notifies all vendors that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this advertisement and will not be discriminated against on the grounds of race, color or national origin in consideration for an award.

A.28 MBE/WBE

The State of Florida, **Office of Supplier Diversity** provides the certification process and the database for identifying certified MBE/WBE firms. This service may be directly accessed at: <http://www.osd.dms.state.fl.us/iframe.htm>

If you have any questions regarding this State service, please contact their office at (850) 487-0915.

A.29 MATHEMATICAL ERRORS

In the event of multiplication/extension error(s), the unit price shall prevail. In the event of addition error(s) the extension totals will prevail. All bids shall be reviewed mathematically and corrected, if necessary, using these standards, prior to additional evaluation.

A.30 DISCLOSURE

Upon receipt, all inquiries and responses to inquiries related to this Invitation for Bid become "Public Records" and are subject to public disclosure consistent with Chapter 119, Florida Statutes.

Bids become "Public Records" thirty (30) days after the bid opening or if an award decision is made earlier than this time as provided by Florida Statute 119.071 (Latest Statute Dated June 2, 2011). No announcement or review of the bid documents shall be conducted at the public opening of the bids.

Based on the above, Manatee County will receive bids at the date and time stated, and will make public at the opening the names of the business entities of all that submitted an offer and any amount presented as a total offer without any verification of the mathematics or the completeness of the offer. Upon the expiration of the statutory term for exemption the actual documents may be inspected or copied. When County staff have completed a mathematic validation and inspected the completeness of the offers, tabulation shall be posted on www.mymanatee.org.

A.31 E-VERIFICATION

Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system, in accordance with the terms governing use of the system, to confirm the employment eligibility of;

1. all persons employed by the Contractor during the term of the Contract to perform employment duties within Florida; and
2. all persons, including subcontractors, assigned by the Contractor to perform work pursuant to the contract with the State Agency.

NOTE: ANY OR ALL STATEMENTS CONTAINED IN THE FOLLOWING SECTIONS: BASIS OF AWARD, TERMS AND CONDITIONS OF THE CONTRACT, OR SPECIFICATIONS, WHICH VARY FROM THE INFORMATION TO BIDDERS, SHALL HAVE PRECEDENCE.

END OF SECTION

SECTION 00020
BASIS OF AWARD

B.01 BASIS OF AWARD

Award shall be to the most responsive, responsible bidder meeting specifications and having the lowest Total Bid Price for **Bid "A"**, or the lowest Total Bid Price for **Bid "B"**, for the requirements listed on the Bid Form for the Work as set forth in this Invitation For Bid. Bid Prices shall include costs for furnishing all labor, equipment and/or materials for the completion of the Work in accordance with and in the manner set forth and described in the Contract Documents to the County's satisfaction within the prescribed time.

Two schedules for Completion of the Work shall be considered. Each bid for completion by the specified stated time shall be offered as a separate "Total Bid Price". The County has the sole authority to select the bid based on the Completion Time which is in the best interest of the County. Only one award shall be made.

In evaluating bids, the County shall consider the qualifications of the bidders; and if required, may also consider the qualifications of the subcontractors, suppliers, and other persons and organizations proposed. County may also consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work.

Whenever two or more bids which are equal with respect to price, quality and service are received, the award shall be determined by a chance drawing conducted by the Purchasing Office and open to the public.

B.02 SUBCONTRACTORS

Subcontractors shall be bound by the terms and conditions of this contract insofar as it applies to their Work, but this shall not relieve the prime contractor from the full responsibility of the County for the proper completion of all Work to be executed under this contract.

The employment of unauthorized aliens by any vendor is considered a violation of Section 274 (e) of the Immigration and Employment Act. If the vendor knowingly employs unauthorized aliens, such violation shall be cause for unilateral cancellation of this agreement.

B.03 QUALIFICATIONS OF BIDDERS

Each bidder must secure all licenses required (in accordance with Chapter 489 Florida Statutes) for the work which is the subject of this bid; and, upon request, shall submit a true copy of all applicable licenses. The License requirement for this project is: **General Contractor. A copy of the License shall be submitted along with the Contractor's Questionnaire.**

To demonstrate qualifications to perform the Work, each bidder must be prepared to submit within five days of County's request; written evidence such as financial data, previous experience, present commitments and other such data as may be requested. Bidder must be able to provide evidence of Bidder's qualification to do business in the state of Florida. Each bidder shall submit as a portion of their bid, a completed Contractor's Questionnaire included as Section 00430.

A complete list of all subcontractors proposed for any portion of the Work may be requested of any Bidder deemed necessary by the Owner. Subcontracts shall be awarded only to those subcontractors considered satisfactory by the Owner.

B.04 INSPECTION OF SITE

Prior to submission of a bid, each bidder shall visit the site to become familiar with all conditions that may affect services that are required to completely execute the full intent of these specifications. Site visit shall be acknowledged in Section 00300, Bid Form, page 00300-1.

B.05 PREPARATION OF CONTRACT

A written notice confirming award or recommendation thereof will be forwarded to the Successful Bidder accompanied by the required number of unsigned counterparts of the Agreement. Within 10 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement with any other required documents to County. (Note: Contract must be approved in accordance with the Manatee County Code of Laws, Chapter 2-26, Manatee County Purchasing Ordinance and the Standard and Procedures approved by the County Administrator).

END OF SECTION

SECTION 00030

GENERAL TERMS AND CONDITIONS OF THE CONTRACT**C.01 CONTRACT FORMS**

The agreement resulting from the acceptance of a bid shall be in the form of the agreement stated in this bid.

C.02 ASSIGNMENT OF CONTRACT

Contractor shall not assign, transfer, convey, sublet or otherwise dispose of this Contract or of his right, title, or interest therein, or his power to execute such Contract, or to assign any monies due or to become due there under to any other person, firm or corporation unless first obtaining the written consent of the County. The giving of such consent to a particular subcontractor assignment shall not dispense with the necessity of such consent to any further or other assignment.

C.03 COMPLETION OF WORK

The Work will be completed and ready for final inspection within the specified calendar days from the date the Contract Time commences to run. Two bids shall be considered based on **Bid "A" 120 calendar days** and **Bid "B" based on 180 calendar days**. The County has the sole authority to select the bid based on the Completion Time which is in the best interest of the County. Only one award shall be made.

C.04 LIQUIDATED DAMAGES

If the Contractor refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will hinder its completion within the time specified, the County may seek damages. The actual damages for delay will be impossible to determine and in lieu thereof, the Contractor shall pay to the Owner the sum of **\$566.00** as fixed, agreed, and liquidated damages for each calendar day of the delay until the Work is finally accepted by the County and the Contractor and his Surety shall be liable for the amount thereof.

C.05 PAYMENT

In accordance with the Prompt Payment Act, Florida Statute 218.71, Contractor may apply for partial payment on monthly estimates, based on the amount of Work done or completed in compliance with the provisions of the Contract. Contractor shall submit an application, on a form provided or approved by the County, of an approximate estimate of the proportionate value of the Work done, items and locations of the Work performed up to and including the last day of the period then ending. The County will then review said estimate and make any necessary revisions so that the estimate can receive approval for payment. If the Contractor and the County do not agree on the approximate estimate of the proportionate value of the Work done for any pay period, the determination of the County will be binding. The amount of said estimate after deducting any required retainage and all previous payments shall be due and payable to the Contractor within 20 days after the pay estimate has been approved by the County. **If Outside Agent approval is required, payment shall be due 25 business days after the pay estimate has been approved by the agent for the County.** It is the Contractor's responsibility for the care of the materials.

C.05 PAYMENT (Continued)

Any damage to or loss of said materials is the full responsibility of the Contractor. Any Periodical Pay Estimate signed by the Contractor shall be final as to the Contractor for any or all work covered by the Periodical Pay Estimate. Any requests for payment of materials stored on site must be accompanied with a paid receipt. The Contractor warrants and guarantees that title to all work, materials and equipment covered by any application for payment, whether incorporated in the project or not, will pass to the County at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereafter referred to as "Liens").

The Contractor agrees to furnish an affidavit stating that all laborers, material men, and subcontractors have been paid on the project for Work covered by the application for payment and that a partial or complete release of lien, as may be necessary, be properly executed by the material men, laborers, subcontractors on the project for Work covered by the application for payment, sufficient to secure the County from any claim whatsoever arising out of the aforesaid Work.

When the Contractor has completed the Work in compliance with the terms of the Contract Documents, he shall notify the County in writing that the project is ready for final inspection. The County will then advise the Contractor as to the arrangements for final inspection and what Work, if any, is required to prepare the project or a portion thereof for final inspection. When the County determines the project or portion thereof is ready for final inspection, the County shall perform same. Upon completion of final inspection, the County will notify Contractor of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies. When all such errors have been corrected, a final re-inspection will be made. The process will be repeated until, in the opinion of the County, the project has been completed in compliance with the terms of the Contract Documents.

When final acceptance has been made by the County, the County will make final payment of the Contract amount, plus all approved additions, less approved deductions and previous payments made. The Contract will be considered complete when all work has been finished, the final inspection made, approved as-builts received, and the project finally accepted in writing by the County. The Contractor's responsibility shall then terminate except as otherwise stated.

C.06 RETAINAGE

A **retainage** of 2.5% of the total contract amount shall be withheld from payments after 75% completion of the Work. Upon substantial completion, this retainage shall be reduced to 1% of the total contract amount plus such amount as the Owner may reasonably deem necessary to repair, replace, complete or correct any damaged, defective, incorrect or incomplete work. Upon final acceptance, the remaining retainage shall be included in the final payment.

C.07 WARRANTY AND GUARANTEE PROVISIONS

All work, materials, and equipment furnished as defined herein shall be guaranteed and warranted by the contractor for a minimum period of three (3) years, unless otherwise specified, from final acceptance by the Owner to be free from defects due either to faulty materials or equipment or faulty workmanship.

All materials, equipment, and workmanship furnished and installed by the contractor is warranted and guaranteed by the contractor to be such as to meet the required standards and to accomplish the purposes and functions required standards and to accomplish the purposes and functions of the project as defined, detailed, and specified herein.

The Owner shall, following discovery thereof, promptly give written notice to the contractor of faulty materials, equipment, or workmanship within the period of the guarantee and the contractor shall promptly replace any part of the faulty equipment, material, or workmanship at his own cost. These warranty and guarantee provisions create no limitations on the Owner as to any claims or actions for breach of guaranty or breach of warranty that the Owner might have against parties other than the contractor, and do not constitute exclusive remedies of the Owner against the contractor.

C.8 ROYALTIES AND PATENTS

The contractor shall pay all royalties and license fees for equipment or processes in conjunction with the equipment and/or services being furnished. Contractor shall defend all suits or claims for infringement of any patent, trademark or copyright, and shall save the County harmless from loss on account thereof, including costs and attorney's fees.

C.9 AUTHORIZED PRODUCT REPRESENTATION

The contractor, by virtue of submitting the name and specifications of a manufacturer's product, will be required to furnish the named manufacturer's product. Failure to perform accordingly may, in the County's sole discretion, be deemed a breach of contract, and shall constitute grounds for the County's immediate termination of the contract.

C.10 REGULATIONS

It shall be the responsibility of the bidder to assure compliance with any OSHA, EPA and/or other federal or state of Florida rules, regulations or other requirements, as each may apply.

C.11 CANCELLATION

Any failure of the contractor to furnish or perform the Work (including, but not limited to, commencement of the Work, failure to supply sufficient skilled workers or suitable materials or equipment) in accordance with the contract, the County may order the stop of the Work, or any portion thereof, until the cause for such order has been eliminated. If the contractor persistently fails to perform the Work in accordance with the contract, the County reserves the right to terminate the contract and select the next qualified bidder or re-advertise this procurement in part or in whole. The County reserves the right to cancel all or any undelivered or unexecuted portion of this contract with or without cause.

C.12 INDEMNIFICATION

The contractor covenants and agrees to indemnify and save harmless the County, its agents and employees, from and against all claims, suits, actions, damages, causes of action, or judgments arising out of the terms of the resulting agreement for any personal injury, loss of life, or damage to the property sustained as a result of the performance or non-performance of services or delivery of goods; from and against any orders, judgments, or decrees, which may be entered against the County, its agents or employees; and from and against all costs, attorney's fees, expenses and other liabilities incurred in the defense of any such claim, suit or action, and the investigation thereof. Nothing in the award, resulting agreement, contract or Purchase Order shall be deemed to affect the rights, privileges and immunities of the County as set forth in Florida Statute Section 768.28.

C.13 MANUALS, SCHEMATICS, HANDBOOKS

All manuals, schematics and handbooks shall be provided which are applicable to the equipment delivered. An operators manual, parts manual and technician manual must also be provided. Parts lists (manuals) must include OEM part numbers for items not manufactured by the bidder. Vendor shall furnish two (2) copies of each.

C.14 INSURANCE

The contractor will not commence work under a contract until all insurance under this section and such insurance coverage as might be required by the County has been obtained. The contractor shall obtain, and submit to Purchasing within 10 calendar days of request, at his expense, the following minimum amounts of insurance (inclusive of any amounts provided by an umbrella or excess policy):

a. Workers' Compensation/Employers' Liability

Part One - There shall be no maximum limit (other than as limited by the applicable statute) for liability imposed by Florida Workers' Compensation Act or any other coverage required by the contract documents which are customarily insured under Part One of the standard Workers' Compensation Policy.

C.14 INSURANCE (Continued)

Part Two - The minimum amount of coverage required by the contract documents which are customarily insured under Part Two of the standard Workers' Compensation Policy shall be:

<u>\$100,000</u>	(Each Accident)
<u>\$500,000</u>	(Disease-Policy Limit)
<u>\$100,000</u>	(Disease-Each Employee)

b. Commercial General Liability

The limits are to be applicable only to work performed under this contract and shall be those that would be provided with the attachment of the Amendment of Limits of Insurance (Designated Project or Premises) endorsement (ISO Form CG 25 03) a Commercial General Liability Policy with the following minimum limits.

General Aggregate:

Products/Completed Operations Aggregate	<u>\$1,000,000</u>
Personal and Advertising Injury	<u>\$1,000,000</u>
Each Occurrence	<u>\$1,000,000</u>
Fire Damage (Any One Fire)	<u>\$Nil</u>
Medical Expense (Any One Person)	<u>\$Nil</u>

c. Business Auto Policy

Each Occurrence Bodily Injury and	
Property Damage Liability Combined	<u>\$300,000</u>
Annual Aggregate (if applicable):	<u>\$1,000,000</u>

d. Owners Protective Liability Coverage

The minimum OPC Policy limits per occurrence and, if subject to an aggregate, annual aggregate to be provided by the contractor shall be the same as the amounts shown above as the minimum per occurrence and general policy aggregate limits respectively required for the Commercial General Liability coverage. The limits afforded by the OPC Policy and any excess policies shall apply only to the Owner and the Owner's officials, officers, agents and employees and only to claims arising out of or in connection with the work under this contract.

e. Property Insurance

If this contract includes construction of or additions to above ground buildings or structures, contractor shall provide "**Builder's Risk**" insurance with the minimum amount of insurance to be 100% of the value of such addition(s), building(s), or structure(s).

C.14 INSURANCE (Continued)**f. Installation Floater**

If this contract does not include construction of or additions to above ground building or structures, **but does involve** the installation of machinery or equipment, contractor shall provide an "**Installation Floater**" with the minimum amount of insurance to be 100% of the value of such addition(s), building(s), or structure(s).

g. Certificates of Insurance and Copies of Policies

Certificates of Insurance in triplicate evidencing the insurance coverage specified in the six above paragraphs a., b., c., d., e., and f., shall be filed with the Purchasing Director before operations are begun. The required certificates of insurance shall name the types of policy, policy number, date of expiration, amount of coverage, companies affording coverage, and also shall refer specifically to the bid number, project title and location of project. Insurance shall remain in force at least one year after completion and acceptance of the project by the County, in the amounts and types as stated herein, with coverage for all products and services completed under this contract.

ADDITIONAL INSURED: The contractor shall name Manatee County as additional insured in each of the applicable policies.

If the initial insurance expires prior to the completion of operations and/or services by the contractor, renewal certificates of insurance and required copies of policies shall be furnished by the contractor and delivered to the Purchasing Director thirty (30) days prior to the date of their expiration.

Nothing herein shall in any manner create any liability of the County in connection with any claim against the contractor for labor, services, or materials, or of subcontractors; and nothing herein shall limit the liability of the contractor or contractor's sureties to the County or to any workers, suppliers, material men or employees in relation to this contract.

C.15 BID BOND/CERTIFIED CHECK

By offering a submission to this Invitation For Bid, the bidder agrees should the bidder's bid be accepted, to execute the form of contract and present the same to Manatee County for approval within 10 days after being notified of the awarding of the contract. The bidder further agrees that failure to execute and deliver said form of contract **within 10 days** will result in damages to Manatee County and as guarantee of payment of same a bid bond/certified check shall be enclosed within the submitted sealed bid in the amount of five (5%) percent of the total amount of the bid.

C.15 BID BOND/CERTIFIED CHECK (Continued)

The bidder further agrees that in case the bidder fails to enter into a contract, as prescribed by Manatee County, the bid bond/certified check accompanying the bid shall be forfeited to Manatee County as agreed liquidated damages. If the County enters into a contract with a bidder, or if the County rejects any and/or all bids, accompanying bond will be promptly returned.

C.16 PERFORMANCE AND PAYMENT BONDS

The successful bidder shall furnish surety bonds as security for faithful performance of the contract awarded as a result of this bid, and for the payment of all persons performing labor and/or furnishing material in connection therewith. Surety of such bonds shall be in an amount equal to the bid award (100% each) and from a duly authorized and nationally recognized surety company, authorized to do business in Florida, satisfactory to this County. The attorney-in-fact who signs the bonds must file with the bonds a certificate and effective dated copy of power-of-attorney. (Reference Florida Statute 255.05)

Furnishing the performance and payment bonds shall be requisite to execution of a contract with the County. Said performance and payment bonds will remain in force for the duration of the contract with the premiums paid by the contractor. Failure of successful bidder to execute such contract and to supply the required bonds shall be just cause for annulment of the award.

The County may then contract with another acceptable bidder or re-advertise this Invitation For Bid. If another bidder is accepted, and notice given within 90 days after the opening of bids, this acceptance shall bind the bidder as though they were originally the successful bidder.

Failure of the County at any time, to require performance by the contractor of any provisions set out in the contract will in no way affect the right of the County, thereafter, to enforce the provisions. Bonds to remain in effect for one year after final payment becomes due.

C.17 NO DAMAGES FOR DELAY

No claim for damages or any claim other than for an extension of time shall be made or asserted against the County by reason of any delays. The Contractor shall not be entitled to an increase in the Total Contract Price or payment or compensation of any kind from the County or direct, indirect, consequential impact or other costs, expenses for damages, including but not limited to costs of acceleration or inefficiency arising because of delay, disruption, interference or hindrance from any

C.17 NO DAMAGES FOR DELAY (Continued)

cause whatsoever; provided, however, that this provision shall not preclude recovery or damages by the Contractor for hindrance or delays due solely to fraud, bad faith, or active interference on part of the County or its agents. Otherwise, the Contractor shall only be entitled to extensions of the Contract Time as the sole and exclusive remedy for such resulting delay, in accordance with and to the extent specifically provided above.

C.18 NO INTEREST

Any monies not paid by the County when claimed to be due to the Contractor under this Contract shall not be subject to interest including prejudgment interest. Any monies not paid by the County when claimed to be due to the Contractor for damages awarded in the case of construction delays shall not be subject to prejudgment interest.

C.19 CONSTRUCTION OF CONTRACT

This Contract and the rights and responsibilities hereunder shall not be construed more strongly against either party, regardless of the extent to which such party may have participated in the preparation hereof.

END OF SECTION

SECTION 00100
BID SUMMARY

D.01 THE WORK

The Work consists of the Removal of all Existing Signal and Equipment and replacing the existing Signal with a Mast Arm Signal and the Installation of New Signal Equipment. **All required MOT shall be provided by the contractor.**

The Work shall be done in accordance with Florida Department of Transportation Standard (FDOT), Articles and Sub articles of the General Requirements and Covenants division (Division I) and all of the Construction Details and Materials divisions (Division II and III) of the 2010 Edition of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, unless otherwise noted and Supplemental Specifications insofar as the same may apply.

The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

D.02 SUBCONTRACTORS, SUPPLIERS AND OTHER

The identity of subcontractors, suppliers, and other persons and organizations (including those who are to furnish the principal items of material and equipment) may be requested by the County for each bid item from any of the Bidders; and the Bidder shall respond within five days after the date of such request. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such subcontractor, supplier, persons or organization if requested by County. If County, after due investigation, has reasonable objection to any proposed subcontractor, supplier, other person or organization, County may, before the Notice of Award is given, request the apparent successful Bidder to submit an acceptable substitute without an increase in Contract Price or Contract Time. If apparent successful Bidder declines to make any such substitution, County may award the contract to the next lowest qualified Bidder that proposes to use acceptable subcontractors, suppliers, and other persons who County does not make written objection to Contractor shall not be required to employ any subcontractor, supplier, other person or organization who Contractor has reasonable objection to.

Subcontractors shall be bound by the terms and conditions of this contract insofar as it applies to their Work, but this shall not relieve the prime contractor from the full responsibility to the County for the proper completion of all Work to be executed under this contract.

D.02 SUBCONTRACTORS, SUPPLIERS AND OTHER (Continued)

No more than 70% of the Total Bid Price, including labor and materials (excluding the Discretionary Work) shall be performed by subcontractors. It is a requirement of FHWA that a minimum of 30% of the Scope of Work shall be performed by the Prime Contractor. Bid Form includes a duplication of bid items where the Bidder shall state the percentage of work and a description of the work (of each item) which shall be performed by a Subcontractor.

D.03 BIDS

Bids are to be submitted in triplicate, one original and two copies, upon the County supplied forms. All blank spaces must be filled in as noted with amounts extended and totaled and no changes shall be made in the wording of the forms or in the items mentioned therein. In the event a change is made in your submittal, the Bidder shall write its initials by the change. Any bid may be rejected which contains any omissions, alterations, irregularities of any kind, or which shall in any manner fail to conform to bid requirements.

A bid made by an individual, either in his/her own or proper person or under a trade or firm name, shall be executed under the individual's signature. If made by a partnership, the bid shall be executed by two or more of the general partners. If made by a corporation, the bid shall be executed by its President or other legally authorized corporate officer or agent.

D.04 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Bid Documents thoroughly (b) visit the site to become familiar with local conditions that may affect cost, progress, performance, or furnishing of the Work; (c) consider federal, state, and local codes, laws, and regulations that may affect costs, progress, performance, or furnishing of the Work; (d) study and carefully correlate Bidder's observations with the Bid Documents; and (e) notify County of all conflicts, errors, or discrepancies in the Bid Document

The accuracy of the existing utility locations shown on the plans is approximate and without express or implied warranty. Each Bidder may, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies, and obtain any additional information and data which pertain to the physical conditions at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine his Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

County will provide each Bidder access to the site to conduct such explorations and tests. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands

D.04 EXAMINATION OF CONTRACT DOCUMENTS AND SITE (Continued)

designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by County unless otherwise provided in the Contract Documents.

D.05 MATERIALS AND WORKMANSHIP

All materials and apparatus required for this Work, except as specifically specified otherwise, shall be new, of first class quality, and shall be furnished, delivered, connected and finished in every detail. Construction shall be prescribed by good industry practice and in accordance with manufacturer's recommendations for the type being installed.

Use skilled workman trained and experienced in the necessary trades and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this section.

D.06 REGULATIONS AND MATERIAL DISPOSAL

It shall be the responsibility of the contractor to assure compliance with any OSHA, EPA, federal, state, and/or local rules, regulations or other requirements as each may apply.

D.07 PROJECT CLOSE-OUT

Clean construction site and remove any and all excess materials. Correct any damages to property that may have occurred as a result of installation and/or delivery. Repair and patch all surfaces cut for installation. The Contractor shall remedy any deficiencies promptly should the County determine any work is incomplete or defective.

When the County determines the Work is acceptable in accordance with this Invitation for Bid, the Contractor shall provide the close out submittals, including but not necessarily limited to the following:

- 1 set – Certificate of warranties
- 1 set - Manufacturer's product literature
- 1 set - Project Record Drawings
- 1 set - Subcontractor / Supplier Information

D.08 DISCRETIONARY WORK

This Bid Item entails minor increases (that may be directed by staff) to existing bid item quantities or minor modification items not bid which were unforeseen and necessary during the construction to provide a safe, complete project in accordance with Bid Documents. (This will not affect the requirement for change orders involving major modifications to the project.) Payment for all Work under this item shall be made only at the County's discretion in order to satisfactorily complete the project. In general, this item is for unanticipated conflicts and/or design changes required during construction which are necessary to complete the project without changing the initial scope of Work and without costly delays.

D.09 PROJECT IDENTIFICATION SIGNS

The Contractor shall be responsible for furnishing, installing and maintaining the Project Identification Sign. Contractor shall be responsible for the removal of same upon completion of the construction. Project Identification Sign shall be constructed and maintained at the Project Site as directed by the Owner. The Contractor shall erect, maintain and relocate the sign as directed for the duration of the Project.

The Contractor shall mount the sign(s) using 4-inch pressure treated lumber or as approved by the Engineer, and other supports as required, at a location mutually agreed by the Engineer and the Contractor.

The identification sign(s) shall not be less than 32 square feet in area. The Contractor shall coordinate with the Owner for the sign(s) verbiage before fabrication. The sign(s) shall be painted with graphic content to include:

- Title of Project
- Name of Owner
- Names and Titles of Authorities, as directed by Owner
- Prime Contractor
- Major Subcontractors
- Construction Costs

The sign(s) shall be erected prior to commencement of work at a lighted location of high public visibility, adjacent to the main entrance at each end of the project, as approved by the Engineer and Owner.

The sign(s) shall be a minimum of 8 feet wide and 4 feet high. The sign(s) shall be constructed of high density ¾" exterior plywood without waves or buckles, mounted and braced with pressure treated lumber as necessary and maintained in a presentable condition for the duration of the project. Hardware shall be galvanized. The surface of the sign(s) shall be of exterior plywood with medium density overlay.

D.09 PROJECT IDENTIFICATION SIGNS (Continued)

Painting shall be constructed with materials to resist weathering and fading during the construction period. Experienced professionals shall perform painting. Graphic design and style shall be in accordance with the following:

- The sign(s) shall be placed in accordance with Manatee County Development Code, Ordinance 90-01, Section 724, Signs and Section 713, Visibility Triangles.

D.10 PERMITS

The Contractor shall procure (unless otherwise stated) all permits and licenses, pay all charges, fees, and taxes and give all notices necessary and incidental to the due and lawful prosecution of the Work.

END OF SECTION

BID FORM
SECTION 00300

For: Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals

TOTAL BID PRICE "A"

(Based on a completion time of 120 Calendar Days) \$ _____

TOTAL BID PRICE "B"

(Based on a completion time of 180 Calendar Days) \$ _____

Two schedules for Completion of the Work shall be considered. Each bid for completion by the specified stated time shall be offered as a separate "Total Bid Price". The County has the sole authority to select the bid based on the Completion Time which is the best interest of the County. Only one award shall be made.

We, the undersigned, hereby declare that we have carefully reviewed the bid documents, and with full knowledge and understanding of the aforementioned herewith submit this bid, meeting each and every specification, term, and condition contained in the Invitation for Bids.

We understand that the bid technical specifications, terms, and conditions in their entirety shall be made a part of any agreement or contract between Manatee County and the successful bidder. Failure to comply shall result in contract default, whereupon, the defaulting contractor shall be required to pay for any and all re-procurement costs, damages, and attorney fees as incurred by the County.

Communications concerning this Bid shall be addressed as follows:

Person's Name: _____

Address: _____ Phone: _____

Date: _____ FLContractorLicense# _____

Bidder is a WBE/MBE Vendor? _____ Certification _____

COMPANY'S NAME: _____

AUTHORIZED SIGNATURE(S): _____

Name and Title of Above Signer(s) _____

CO. MAILING ADDRESS: _____

STATE OF INCORPORATION _____ (if applicable)

TELEPHONE: (____) _____ FAX: (____) _____

EMAIL ADDRESS: _____

Acknowledge Addendum No. ____ Dated: ____ Acknowledge Addendum No. ____ Dated: ____

SIGN AND CONFIRM DATE OF PROJECT VISIT: _____ DATE: _____

BID FORM

IFB# 11-2454-OV

(Submit in Triplicate) Section 00300

Bid "A"

Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860 / 6.2

IFB #11-2454-OV

BID "A" Based on Completion Time of 120 Calendar Days

ITEM #	FDOT ITEM	DESCRIPTION	U/M	QTY.	BID PRICE PER UNIT	TOTAL BID PRICE
1	101-1	MOBILIZATION	LS	1	\$	\$
2	102-1	MAINTENANCE OF TRAFFIC	LS	1	\$	\$
3	110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT, CURB, S/W	SY	93.4	\$	\$
4	520-1-10	CONCRETE CURB & GUTTER, TYPE F	LF	104	\$	\$
5	522-2	6" CONCRETE SIDEWALK	SY	165.5	\$	\$
6	555-1-2	DIRECTIONAL BORE (6" TO <12" (2" HDPE)	LF	315	\$	\$
7	630-1-12	*CONDUIT (F&I) (UNDERGROUND (1.25"))	LF	10	\$	\$
8	630-1-12	*CONDUIT (F&I) (UNDERGROUND (2"))	LF	1,320	\$	\$
9	630-1-13	*CONDUIT (F&I) (UNDERPAVEMENT)	LF	70	\$	\$
10	632-7-1	*CABLE (SIGNAL) (F&I)	PI	1	\$	\$
11	635-1-11	*PULL AND JUNCTION BOXES (F&I) (PULL BOX)	EA	11	\$	\$
12	639-1-22	*ELECTRICAL POWER SERVICE (UNDERGROUND)	AS	1	\$	\$
13	639-2-1	*ELECTRICAL SERVICE WIRE (F&I)	LF	840	\$	\$
14	641-2-12	*PRESTRESSED CONCRETE POLE (F&I) (TYPE P-II POLE)	EA	1	\$	\$
15	649-31-299	*STEEL MAST ARM ASSEMBLY (F&I) (130 MPH (CUSTOM)	EA	4	\$	\$
16	650-51-311	*TRAFFIC SIGNAL (F&I) (3 SECT.) (1-WAY) (LED)	AS	4	\$	\$
17	650-51-511	*TRAFFIC SIGNAL (F&I) (5 SECT.) (1-WAY) (LED)	AS	4	\$	\$
18	653-191	* PEDESTRIAN SIGNALS (F&I) (LED) (1-WAY) (COUNTDOWN)	AS	8	\$	\$
19	659-101	*SIGNAL HEAD AUX. (F&I) (BACK PLATES, 3 SECT.)	EA	4	\$	\$
20	659-106	*SIGNAL HEAD AUX. (F&I) TUNNEL VISORS.)	EA	32	\$	\$
21	659-107	*SIGNAL HEAD AUX. (F&I) (ALUMINUM PEDESTAL)	EA	8	\$	\$

Bidder: _____

Authorized
Signature: _____

Bid A

00300-2

BID FORM

IFB# 11-2454-OV

(Submit in Triplicate) Section 00300

Bid "A"

Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860 / 6.2

IFB #11-2454-OV

BID "A" Based on Completion Time of 120 Calendar Days

ITEM #	FDOT ITEM	DESCRIPTION	U/M	QTY.	BID PRICE PER UNIT	TOTAL BID PRICE
22	659-118	*SIGNAL HEAD AUX. (F&I) (BACK PLATES, 5 SECT.)	EA	4	\$	\$
23	663-74-15	*VEHICLE DETECTOR ASSEMBLIES (F&I) (VIDEO)	EA	4	\$	\$
24	665-13	*PED.DETECTOR (F&I) (DETECTOR WITH SIGN ONLY)	EA	8	\$	\$
25	670-5-110	*TRAFFIC CONTROLLER ASSEMBLY (F&I) (NEMA) (NO PREEMPT)	AS	1	\$	\$
26	685-106	*UNINTERRUPTIBLE POWER SOURCE (UPS)	EA	1	\$	\$
27	690-10	REMOVE SIGNAL HEAD ASSEMBLY	EA	8	\$	\$
28	690-34-1	REMOVE POLE (DEEP) (DIRECT BURIAL)	EA	2	\$	\$
29	690-50	REMOVE CONTROLLER ASSEMBLY	EA	1	\$	\$
30	690-60	REMOVE VEHICLE DETECTOR ASSEMBLY	EA	10	\$	\$
31	690-80	REMOVE SPAN WIRE ASSEMBLY	EA	1	\$	\$
32	690-90	REMOVE CONDUIT & CABLING	PI	1	\$	\$
33	690-100	REMOVE MISCELLANEOUS SIGNAL EQUIPMENT	PI	1	\$	\$
34	699-1-1	*INTERNALLY ILLUMINATED SIGN (F&I) EDGE LIT LED	EA	4	\$	\$
35	700-48-60	SIGN PANEL(REMOVE)	EA	3	\$	\$
36	711-11-111	THERMOPLASTIC PAVEMENT MARKINGS (6" WHITE)	LF	72	\$	\$
37	711-11-123	THERMOPLASTIC PAVEMENT MARKINGS (12" WHITE)	LF	465	\$	\$
38	711-17	REMOVE THERMOPLASTIC PAVEMENT MARKINGS	SF	525	\$	\$
39	780-1-12	*ITS POWER SERVICE WIRE	LF	930	\$	\$

Bidder: _____

Authorized
Signature: _____**Bid A**

00300-3

BID FORM

IFB# 11-2454-OV

(Submit in Triplicate) Section 00300

Bid "A"

Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860 / 6.2

IFB #11-2454-OV

BID "A" Based on Completion Time of 120 Calendar Days

ITEM #	FDOT ITEM	DESCRIPTION	U/M	QTY.	BID PRICE PER UNIT	TOTAL BID PRICE
40	783-1-121	*ITS FIBER OPTIC CABLE (F&I)	LF	115	\$	\$
41	783-2-31	*ITS FIBER OPTIC (INSTALL) (SPLICE)	EA	4	\$	\$
42	784-1-1	*ITS FIELD ETHERNET SWITCH	EA	1	\$	\$
43		DISCRETIONARY WORK	LS	1		\$35,000.00
44	999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)				
TOTAL BID PRICE "A"- Based On Completion Time of 120 Calendar Days						\$

Bidders Note: *Asterisk indicates items requiring Shop Drawing submittals. The Contractor shall be responsible for the preparation and submittal of all Shop Drawings in accordance with FDOT Standard Specifications For Road and Bridge Construction 5-1.4.2 Work Items Requiring Shop Drawings.

Bidder: _____

Bid AAuthorized
Signature: _____

00300-4

BID FORM - SUBCONTRACTOR PERCENTAGE

IFB#11-2454-OV

(Submit in Triplicate) Section 00300

Bid "A"

Cortez Road @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860. 6.2

IFB #11-2454-OV

BID "A" Based on Completion Time of 120 Calendar Days

ITEM #	FDOT	WORK BY SUBCONTRACTOR			DESCRIPTION OF WORK BY SUBCONTRACTOR
	ITEM	DESCRIPTION	%	MBE/WBE	
1	101-1	MOBILIZATION			
2	102-1	MAINTENANCE OF TRAFFIC			
3	110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT, CURB, S/W			
4	520-1-10	CONCRETE CURB & GUTTER, TYPE F			
5	522-2	6" CONCRETE SIDEWALK			
6	555-1-2	DIRECTIONAL BORE (6" TO <12" (2" HDPE)			
7	630-1-12	*CONDUIT (F&I) (UNDERGROUND (1.25"))			
8	630-1-12	*CONDUIT (F&I) (UNDERGROUND (2"))			
9	630-1-13	*CONDUIT (F&I) (UNDERPAVEMENT)			
10	632-7-1	*CABLE (SIGNAL) (F&I)			
11	635-1-11	*PULL AND JUNCTION BOXES (F&I) (PULL BOX)			
12	639-1-22	*ELECTRICAL POWER SERVICE (UNDERGROUND)			
13	639-2-1	*ELECTRICAL SERVICE WIRE (F&I)			
14	641-2-12	*PRESTRESSED CONCRETE POLE (F&I) (TYPE P-II POLE)			
15	649-31-299	*STEEL MAST ARM ASSEMBLY (F&I) (130 MPH (CUSTOM)			
16	650-51-311	*TRAFFIC SIGNAL (F&I) (3 SECT.) (1-WAY) (LED)			
17	650-51-511	*TRAFFIC SIGNAL (F&I) (5 SECT.) (1-WAY) (LED)			
18	653-191	*PEDESTRIAN SIGNALS (F&I) (LED) (1-WAY) (COUNTDOWN)			
19	659-101	*SIGNAL HEAD AUX. (F&I) (BACK PLATES, 3 SECT.)			

Bidder: _____

Authorized
Signature: _____**Subcontractor**
Bid A

00300-5

BID FORM - SUBCONTRACTOR PERCENTAGE

IFB#11-2454-OV

(Submit in Triplicate) Section 00300

Bid "A"

Cortez Road @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860. 6.2

IFB #11-2454-OV

BID "A" Based on Completion Time of 120 Calendar Days

ITEM #	FDOT ITEM	WORK BY SUBCONTRACTOR			DESCRIPTION OF WORK BY SUBCONTRACTOR
		DESCRIPTION	%	MBE/WBE	
20	659-106	*SIGNAL HEAD AUX. (F&I) TUNNEL VISORS.)			
21	659-107	*SIGNAL HEAD AUX. (F&I) (ALUMINUM PEDESTAL)			
22	659-118	*SIGNAL HEAD AUX. (F&I) (BACK PLATES, 5 SECT.)			
23	663-74-15	*VEHICLE DETECTOR ASSEMBLIES (F&I) (VIDEO)			
24	665-13	*PED.DETECTOR (F&I) (DETECTOR WITH SIGN ONLY)			
25	670-5-110	*TRAFFIC CONTROLLER ASSEMBLY (F&I) (NEMA) (NO PREEMPT)			
26	685-106	*UNINTERRUPTIBLE POWER SOURCE (UPS)			
27	690-10	REMOVE SIGNAL HEAD ASSEMBLY			
28	690-34-1	REMOVE POLE (DEEP) (DIRECT BURIAL)			
29	690-50	REMOVE CONTROLLER ASSEMBLY			
30	690-60	REMOVE VEHICLE DETECTOR ASSEMBLY			
31	690-80	REMOVE SPAN WIRE ASSEMBLY			
32	690-90	REMOVE CONDUIT & CABLING			
33	690-100	REMOVE MISCELLANEOUS SIGNAL EQUIPMENT			
34	699-1-1	*INTERNALLY ILLUMINATED SIGN (F&I) EDGE LIT LED)			
35	700-48-60	SIGN PANEL(REMOVE)			
36	711-11-111	THERMOPLASTIC PAVEMENT MARKINGS (6" WHITE)			
37	711-11-123	THERMOPLASTIC PAVEMENT MARKINGS (12" WHITE)			
38	711-17	REMOVE THERMOPLASTIC PAVEMENT MARKINGS			
39	780-1-12	*ITS POWER SERVICE WIRE			

Bidder: _____

Authorized
Signature: _____

Subcontractor
Bid A

00300-6

BID FORM - SUBCONTRACTOR PERCENTAGE

IFB#11-2454-OV

(Submit in Triplicate) Section 00300

Bid "A"

Cortez Road @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860. 6.2

IFB #11-2454-OV

BID "A" Based on Completion Time of 120 Calendar Days

ITEM #	FDOT ITEM	WORK BY SUBCONTRACTOR			DESCRIPTION OF WORK BY SUBCONTRACTOR
		DESCRIPTION	%	MBE/WBE	
40	783-1-121	*ITS FIBER OPTIC CABLE (F&I)			
41	783-2-31	*ITS FIBER OPTIC (INSTALL) (SPLICE)			
42	784-1-1	*ITS FIELD ETHERNET SWITCH			
This is a duplication of the bid items where the Bidder shall state the percentage of work (of each item listed) and a description of the work which shall be performed by a subcontractor.					

Bidder: _____

Authorized
Signature: _____**Subcontractor**
Bid A

00300-7

BID FORM

IFB# 11-2454-OV

(Submit in Triplicate) Section 00300

Bid "B"

Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860 / 6.2

IFB #11-2454-OV

BID "B" Based on Completion Time of 180 Calendar Days

ITEM #	FDOT ITEM	DESCRIPTION	U/M	QTY.	BID PRICE PER UNIT	TOTAL BID PRICE
1	101-1	MOBILIZATION	LS	1	\$	\$
2	102-1	MAINTENANCE OF TRAFFIC	LS	1	\$	\$
3	110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT, CURB, S/W	SY	93.4	\$	\$
4	520-1-10	CONCRETE CURB & GUTTER, TYPE F	LF	104	\$	\$
5	522-2	6" CONCRETE SIDEWALK	SY	165.5	\$	\$
6	555-1-2	DIRECTIONAL BORE (6" TO <12" (2" HDPE)	LF	315	\$	\$
7	630-1-12	*CONDUIT (F&I) (UNDERGROUND (1.25"))	LF	10	\$	\$
8	630-1-12	*CONDUIT (F&I) (UNDERGROUND (2"))	LF	1,320	\$	\$
9	630-1-13	*CONDUIT (F&I) (UNDERPAVEMENT)	LF	70	\$	\$
10	632-7-1	*CABLE (SIGNAL) (F&I)	PI	1	\$	\$
11	635-1-11	*PULL AND JUNCTION BOXES (F&I) (PULL BOX)	EA	11	\$	\$
12	639-1-22	*ELECTRICAL POWER SERVICE (UNDERGROUND)	AS	1	\$	\$
13	639-2-1	*ELECTRICAL SERVICE WIRE (F&I)	LF	840	\$	\$
14	641-2-12	*PRESTRESSED CONCRETE POLE (F&I) (TYPE P-II POLE)	EA	1	\$	\$
15	649-31-299	*STEEL MAST ARM ASSEMBLY (F&I) (130 MPH (CUSTOM)	EA	4	\$	\$
16	650-51-311	*TRAFFIC SIGNAL (F&I) (3 SECT.) (1-WAY) (LED)	AS	4	\$	\$
17	650-51-511	*TRAFFIC SIGNAL (F&I) (5 SECT.) (1-WAY) (LED)	AS	4	\$	\$
18	653-191	*PEDESTRIAN SIGNALS (F&I) (LED) (1-WAY) (COUNTDOWN)	AS	8	\$	\$
19	659-101	*SIGNAL HEAD AUX. (F&I) (BACK PLATES, 3 SECT.)	EA	4	\$	\$
20	659-106	*SIGNAL HEAD AUX. (F&I) (TUNNEL VISORS.)	EA	32	\$	\$
21	659-107	*SIGNAL HEAD AUX. (F&I) (ALUMINUM PEDESTAL)	EA	8	\$	\$

Bidder: _____

Bid BAuthorized
Signature: _____

00300-8

BID FORM

IFB# 11-2454-OV

(Submit in Triplicate) Section 00300

Bid "B"

Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860 / 6.2

IFB #11-2454-OV

BID " B" Based on Completion Time of 180 Calendar Days

ITEM #	FDOT ITEM	DESCRIPTION	U/M	QTY.	BID PRICE PER UNIT	TOTAL BID PRICE
22	659-118	*SIGNAL HEAD AUX. (F&I) (BACK PLATES, 5 SECT.)	EA	4	\$	\$
23	663-74-15	*VEHICLE DETECTOR ASSEMBLIES (F&I) (VIDEO)	EA	4	\$	\$
24	665-13	*PED.DETECTOR (F&I) (DETECTOR WITH SIGN ONLY	EA	8	\$	\$
25	670-5-110	*TRAFFIC CONTROLLER ASSEMBLY (F&I) (NEMA) (NO PREEMPT)	AS	1	\$	\$
26	685-106	*UNINTERRUPTIBLE POWER SOURCE (UPS)	EA	1	\$	\$
27	690-10	REMOVE SIGNAL HEAD ASSEMBLY	EA	8	\$	\$
28	690-34-1	REMOVE POLE (DEEP) (DIRECT BURIAL)	EA	2	\$	\$
29	690-50	REMOVE CONTROLLER ASSEMBLY	EA	1	\$	\$
30	690-60	REMOVE VEHICLE DETECTOR ASSEMBLY	EA	10	\$	\$
31	690-80	REMOVE SPAN WIRE ASSEMBLY	EA	1	\$	\$
32	690-90	REMOVE CONDUIT & CABLING	PI	1	\$	\$
33	690-100	REMOVE MISCELLANEOUS SIGNAL EQUIPMENT	PI	1	\$	\$
34	699-1-1	*INTERNALLY ILLUMINATED SIGN (F&I) EDGE LIT LED)	EA	4	\$	\$
35	700-48-60	SIGN PANEL(REMOVE)	EA	3	\$	\$
36	711-11-111	THERMOPLASTIC PAVEMENT MARKINGS (6" WHITE)	LF	72	\$	\$
37	711-11-123	THERMOPLASTIC PAVEMENT MARKINGS (12" WHITE)	LF	465	\$	\$
38	711-17	REMOVE THERMOPLASTIC PAVEMENT MARKINGS	SF	525	\$	\$
39	780-1-12	*ITS POWER SERVICE WIRE	LF	930	\$	\$

Bidder:_____

Authorized
Signature:_____**Bid B**

00300-9

BID FORM

IFB# 11-2454-OV

(Submit in Triplicate) Section 00300

Bid "B"

Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860 / 6.2

IFB #11-2454-OV

BID " B" Based on Completion Time of 180 Calendar Days

ITEM #	FDOT ITEM	DESCRIPTION	U/M	QTY.	BID PRICE PER UNIT	TOTAL BID PRICE
40	783-1-121	*ITS FIBER OPTIC CABLE (F&I)	LF	115	\$	\$
41	783-2-31	*ITS FIBER OPTIC (INSTALL) (SPLICE)	EA	4	\$	\$
42	784-1-1	*ITS FIELD ETHERNET SWITCH	EA	1	\$	\$
43		DISCRETIONARY WORK	LS	1		\$35,000.00
44	999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)				
TOTAL BID PRICE "B"- Based On Completion Time of 180 Calendar Days						\$

Bidders Note: *Asterisk indicates items requiring Shop Drawing submittals. The Contractor shall be responsible for the preparation and submittal of all Shop Drawings in accordance with FDOT Standard Specifications For Road and Bridge Construction 5-1.4.2 *Work Items Requiring Shop Drawings.*

Bidder: _____

 Authorized
 Signature: _____
Bid B

00300-10

BID FORM - SUBCONTRACTOR PERCENTAGE

IFB#11-2454-OV

(Submit in Triplicate) Section 00300

Bid "B"

Cortez Road @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860. 6.2

IFB #11-2454-OV

BID "B" Based on Completion Time of 180 Calendar Days

ITEM #	FDOT	WORK BY SUBCONTRACTOR			DESCRIPTION OF WORK BY SUBCONTRACTOR
	ITEM	DESCRIPTION	%	MBE/WBE	
1	101-1	MOBILIZATION			
2	102-1	MAINTENANCE OF TRAFFIC			
3	110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT, CURB, S/W			
4	520-1-10	CONCRETE CURB & GUTTER, TYPE F			
5	522-2	6" CONCRETE SIDEWALK			
6	555-1-2	DIRECTIONAL BORE (6" TO <12" (2" HDPE)			
7	630-1-12	*CONDUIT (F&I) (UNDERGROUND (1.25"))			
8	630-1-12	*CONDUIT (F&I) (UNDERGROUND (2"))			
9	630-1-13	*CONDUIT (F&I) (UNDERPAVEMENT)			
10	632-7-1	*CABLE (SIGNAL) (F&I)			
11	635-1-11	*PULL AND JUNCTION BOXES (F&I) (PULL BOX)			
12	639-1-22	*ELECTRICAL POWER SERVICE (UNDERGROUND)			
13	639-2-1	*ELECTRICAL SERVICE WIRE (F&I)			
14	641-2-12	*PRESTRESSED CONCRETE POLE (F&I) (TYPE P-II POLE)			
15	649-31-299	STEEL MAST ARM ASSEMBLY (F&I) (130 MPH (CUSTOM)			
16	650-51-311	*TRAFFIC SIGNAL (F&I) (3 SECT.) (1-WAY) (LED)			
17	650-51-511	*TRAFFIC SIGNAL (F&I) (5 SECT.) (1-WAY) (LED)			
18	653-191	*PEDESTRIAN SIGNALS (F&I) (LED) (1-WAY) (COUNTDOWN)			
19	659-101	*SIGNAL HEAD AUX. (F&I) (BACK PLATES, 3 SECT.)			

Bidder: _____

Authorized
Signature: _____

Subcontractor
Bid B

00300-11

BID FORM - SUBCONTRACTOR PERCENTAGE

IFB#11-2454-OV

(Submit in Triplicate) Section 00300

Bid "B"

Cortez Road @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860. 6.2

IFB #11-2454-OV

BID "B" Based on Completion Time of 180 Calendar Days

ITEM #	FDOT ITEM	WORK BY SUBCONTRACTOR			DESCRIPTION OF WORK BY SUBCONTRACTOR
		DESCRIPTION	%	MBE/WBE	
20	659-106	*SIGNAL HEAD AUX. (F&I) TUNNEL VISORS.)			
21	659-107	*SIGNAL HEAD AUX. (F&I) (ALUMINUM PEDESTAL)			
22	659-118	*SIGNAL HEAD AUX. (F&I) (BACK PLATES, 5 SECT.)			
23	663-74-15	*VEHICLE DETECTOR ASSEMBLIES (F&I) (VIDEO)			
24	665-13	*PED.DETECTOR (F&I) (DETECTOR WITH SIGN ONLY)			
25	670-5-110	*TRAFFIC CONTROLLER ASSEMBLY (F&I) (NEMA) (NO PREEMPT)			
26	685-106	*UNINTERRUPTIBLE POWER SOURCE (UPS)			
27	690-10	REMOVE SIGNAL HEAD ASSEMBLY			
28	690-34-1	REMOVE POLE (DEEP) (DIRECT BURIAL)			
29	690-50	REMOVE CONTROLLER ASSEMBLY			
30	690-60	REMOVE VEHICLE DETECTOR ASSEMBLY			
31	690-80	REMOTE SPAN WIRE ASSEMBLY			
32	690-90	REMOVE CONDUIT & CABLING			
33	690-100	REMOVE MISCELLANEOUS SIGNAL EQUIPMENT			
34	699-1-1	*INTERNALLY ILLUMINATED SIGN (F&I) EDGE LIT LED)			
35	700-48-60	SIGN PANEL(REMOVE)			
36	711-11-111	THERMOPLASTIC PAVEMENT MARKINGS (6" WHITE)			
37	711-11-123	THERMOPLASTIC PAVEMENT MARKINGS (12" WHITE)			
38	711-17	REMOVE THERMOPLASTIC PAVEMENT MARKINGS			
39	780-1-12	*ITS POWER SERVICE WIRE			

Bidder: _____

Authorized
Signature: _____**Subcontractor**
Bid B

00300-12

BID FORM - SUBCONTRACTOR PERCENTAGE

IFB#11-2454-OV

(Submit in Triplicate) Section 00300

Bid "B"

Cortez Road @ 43rd Street West / Installation of Mast Arm Signals / Bradenton, FL

LAP Agreement #425530-1 / Project No. 6076860. 6.2

IFB #11-2454-OV

BID "B" Based on Completion Time of 180 Calendar Days

ITEM #	FDOT ITEM	WORK BY SUBCONTRACTOR			DESCRIPTION OF WORK BY SUBCONTRACTOR
		DESCRIPTION	%	MBE/WBE	
40	783-1-121	*ITS FIBER OPTIC CABLE (F&I)			
41	783-2-31	*ITS FIBER OPTIC (INSTALL) (SPLICE)			
42	784-1-1	*ITS FIELD ETHERNET SWITCH			
This is a duplication of the bid items where the Bidder shall state the percentage of work (of each item listed) and a description of the work which shall be performed by a subcontractor.					

Bidder: _____

Authorized
Signature: _____**Subcontractor**
Bid B

00300-13

**SWORN STATEMENT
THE FLORIDA TRENCH SAFETY ACT**

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR BY AN OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This Sworn Statement is submitted with IFB No. #11-2454-OV
2. This Sworn Statement is submitted by _____
whose business address is _____
and, if applicable, its Federal Employer Identification Number (FEIN) is _____. If
the entity has no FEIN, include the Social Security Number of the individual signing this
sworn statement _____.
3. Name of individual signing this Sworn Statement is: _____,
Whose relationship to the above entity is: _____.
4. The Trench Safety Standards that will be in effect during the construction of this project shall
include, but are not limited to: Laws of Florida, Chapters 90-96, TRENCH SAFETY ACT, and
OSHA RULES AND REGULATIONS 29 CFR 1926.650 Subpart P, effective October 1, 1990.
5. The undersigned assures that the entity will comply with the applicable Trench Safety Standards
and agrees to indemnify and hold harmless the Owner and Engineer, and any of their agents or
employees from any claims arising from the failure to comply with said standard.
6. The undersigned has appropriated the following costs for compliance with the applicable
standards:

<u>Trench Safety Measure (Description)</u>	<u>Units of Measure (LF, SY)</u>	<u>Unit Quantity</u>	<u>Unit Cost</u>	<u>Extended Cost</u>
a. _____	_____	_____	\$ _____	_____
b. _____	_____	_____	\$ _____	_____
c. _____	_____	_____	\$ _____	_____
d. _____	_____	_____	\$ _____	_____

7. The undersigned intends to comply with these standards by instituting the following procedures:

_____.

THE UNDERSIGNED, in submitting this Bid, represents that they have reviewed and considered all available geotechnical information and made such other investigations and tests as they may deem necessary to adequately design the trench safety system(s) to be utilized on this project.

(AUTHORIZED SIGNATURE / TITLE)

SWORN to and subscribed before me this ____ day of _____, 20____.
(impress official seal)

Notary Public, State of Florida
My commission expires: _____

SECTION 00430
CONTRACTOR'S QUESTIONNAIRE
 (Submit in Triplicate)

The Bidder warrants the truth and accuracy of all statements and answers herein contained.
 (Include additional sheets if necessary.)

THIS QUESTIONNAIRE MUST BE COMPLETED AND SUBMITTED WITH YOUR BID.

1. LICENSE # and COMPANY'S NAME: _____
 CO. PHYSICAL ADDRESS: _____
 TELEPHONE NUMBER: (____) _____ FAX (____) _____

2. Bidding as an; individual; a partnership; a corporation; a joint venture; ____

3. If a partnership: list names and addresses of partners; if a corporation: list names of officers, directors, shareholders, and state of incorporation; if joint venture: list names and address of ventures' and the same if any venture are a corporation for each such corporation, partnership, or joint venture:

4. Your organization has been in business (under this firm's name) as a _____
 For how many years? _____

5. Describe and give the date and owner of the last three government projects you've completed which are similar in cost, type, size, and nature as the one proposed (for a public entity). Include contact name and phone number:

6. Have you ever been assessed liquidated damages under a contract during the past five (5) years? If so, state when, where (contact name, address, and phone number) and why.

7. Have you ever failed to complete work awarded to you? If so, state when, where (Contact name, address, phone number) and why?

8. Have you ever been debarred or prohibited from bidding on a governmental entity's construction project? If yes, name the entity and describe the circumstances:

9. Name three individuals, governmental entities, or corporations for which you have performed similar work and to which you refer. Include contact name and phone number:

1.

2.

3.

10. What specific steps have you taken to examine the physical conditions at or contiguous to the site, including but not limited to, the location of existing underground facilities?

11. What specific physical conditions, including, but not limited to, the location of existing underground facilities have you found which will, in any manner, affect cost, progress, performance, or finishing of the work?

12. Will you subcontract any part of this Work? If so, describe which major portion(s):

13. If any, list (with contract amount) WBE/MBE to be utilized:

14. What equipment do you own to accomplish this Work?

15. What equipment will you purchase/rent for the Work? (Specify which)

16. Provide detail of your organization's initiative to meet the goal of encouraging and promoting environmentally preferable "green" products. **Reference Article A. 21, "Be Green", Section 00010 "Information to Bidders."**

17. List the following in connection with the Surety which is providing the Bond(s):

Surety's Name: _____

Surety's Address: _____

Name, address and phone number of Surety's resident agent for service of process in Florida:

Phone: (_____) _____

Email: _____

SECTION 00491
Drug Free Work Place Certification
 SWORN STATEMENT PURSUANT TO RESOLUTION 6-101 (7) (B),
MANATEE COUNTY PURCHASING CODE

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

This sworn statement is submitted to the Manatee County Board of County Commissioners by _____

[Print individual's name and title]

_____ for _____

Whose business address is _____

?

and (if applicable) its Federal Employer Identification Number (FEIN) is _____

(If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____)

I understand that no person or entity shall be awarded or receive a county contract for public improvements, procurement of goods or services (including professional services) or a county lease, franchise, concession or management agreement, or shall receive a grant of county monies unless such person or entity has submitted a written certification to the County that it will provide a drug free work place by:

(1) providing a written statement to each employee notifying such employee that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance as defined by .893.02(4), Florida Statutes, as the same may be amended from time to time, in the person's or entity's work place is prohibited specifying the actions that will be taken against employees for violation of such prohibition. Such written statement shall inform employees about:

- (i) the dangers of drug abuse in the work place;
- (ii) the person's or entity's policy of maintaining a drug free environment at all its work places, including but not limited to all locations where employees perform any task relating to any portion of such contract, business transaction or grant;
- (iii) any available drug counseling, rehabilitation, and employee assistance programs; and
- (iv) the penalties that may be imposed upon employees for drug abuse violations.

2) Requiring the employee to sign a copy of such written statement to acknowledge his or her receipt of same and advice as to the specifics of such policy. Such person or entity shall retain the statements signed by its employees. Such person or entity shall also post in a prominent place at all of its work places a written statement of its policy containing the foregoing elements (i) through (iv).

(3) Notifying the employee in the statement required by subsection (1) that as a condition of employment the employee will:

- (i) abide by the terms of the statement; and
- (ii) notify the employer of any criminal drug statute conviction for a violation occurring in the work place no later than five (5) days after such a conviction.

(4) Notifying the County within ten (10) days after receiving notice under subsection (3) from an employee or otherwise receiving actual notice of such conviction.

(5) Imposing appropriate personnel action against such employee up to and including termination; or requiring such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement, or other appropriate agency.

(6) Making a good faith effort to continue to maintain a drug free work place through implementation of sections (1) through (5) stated above.

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR MANATEE COUNTY IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT ANY CONTRACT OR BUSINESS TRANSACTION SHALL PROVIDE FOR SUSPENSION OF PAYMENTS, OR TERMINATION, OR BOTH, IF THE CONTRACTING OFFICER OR THE COUNTY ADMINISTRATOR DETERMINES THAT:

- (1) Such person or entity has made false certification.
- (2) Such person or entity violates such certification by failing to carry out the requirements of sections (1), (2), (3), (4), (5), or (6) or Resolution R-01-36 Section 4, E (1) (a) or
- (3) Such a number of employees of such person or entity have been convicted of violations occurring in the work place as to indicate that such person or entity has failed to make a good faith effort to provide a drug free work place as required by Resolution R-01-36 Section 4, E (1) (a).

(Signature)

STATE OF FLORIDA

COUNTY OF _____

Sworn to and subscribed before me this _____ day of _____, 2010

by _____.

Personally known _____ OR produced identification _____

[Type of identification]

My commission expires _____

Notary Public Signature

[Print, type or stamp Commissioned name of Notary Public]

Signatory Requirement: In the case of a business entity other than a partnership or a corporation, this affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, this affidavit shall be executed by the general partner(s). In the case of a corporation, this affidavit shall be executed by the corporate president

PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES CERTIFICATION

SWORN STATEMENT PURSUANT TO ARTICLE 5, MANATEE COUNTY PURCHASING CODE

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

This sworn statement is submitted to the Manatee County Board of County Commissioners by

_____ [print individual's name and title]

_____ for _____
[print name of entity submitting sworn statement]

Whose business is: _____

and (if applicable) its Federal Employer Identification Number (FEIN) is _____ If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____

I understand that no person or entity shall be awarded or receive a county contract for public improvements, procurement of goods or services (including professional services) or a county lease, franchise, concession or management agreement, or shall receive a grant of county monies unless such person or entity has submitted a written certification to the County that it has not:

(1) been convicted of bribery or attempting to bribe a public officer or employee of Manatee County, the State of Florida, or any other public entity, including, but not limited to the Government of the United States, any state, or any local government authority in the United States, in that officer's or employee's official capacity; or

(2) been convicted of an agreement or collusion among bidders or prospective bidders in restraint of freedom of competition, by agreement to bid a fixed price, or otherwise; or

(3) been convicted of a violation of an environmental law that, in the sole opinion of the County's Purchasing Official, reflects negatively upon the ability of the person or entity to conduct business in a responsible manner; or

(4) made an admission of guilt of such conduct described in items (1), (2) or (3) above, which is a matter of record, but has not been prosecuted for such conduct, or has made an admission of guilt of such conduct, which is a matter of record, pursuant to formal prosecution. An admission of guilt shall be construed to include a plea of nolo contendere; or

(5) where an officer, official, agent or employee of a business entity has been convicted of or has admitted guilt to any of the crimes set forth above on behalf of such and entity and pursuant to the direction or authorization of an official thereof (including the person committing the offense, if he is an official of the

business entity), the business shall be chargeable with the conduct herein above set forth. A business entity shall be chargeable with the conduct of an affiliated entity, whether wholly owned, partially owned, or one which has common ownership or a common Board of Directors. For purposes of this Form, business entities are affiliated if, directly or indirectly, one business entity controls or has the power to control another business entity, or if an individual or group of individuals controls or has the power to control both entities. Indicia of control shall include, without limitation, interlocking management or ownership, identity of interests among family members, shared organization of a business entity following the ineligibility of a business entity under this Article, or using substantially the same management, ownership or principles as the ineligible entity.

Any person or entity, who claims that this Article is inapplicable to him/her's/it because a conviction or judgement has been reversed by a court of competent jurisdiction, shall prove the same with documentation satisfactory to the County's Purchasing Director. Upon presentation of such satisfactory proof, the person or entity shall be allowed to contract with the County.

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR MANATEE COUNTY IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT ANY CONTRACT OR BUSINESS TRANSACTION SHALL PROVIDE FOR SUSPENSION OF PAYMENTS, OR TERMINATION, OR BOTH, IF THE CONTRACTING OFFICER OR THE COUNTY ADMINISTRATOR DETERMINES THAT **SUCH PERSON OR ENTITY HAS MADE FALSE CERTIFICATION.**

[Signature]

STATE OF FLORIDA
COUNTY OF _____

Sworn to and subscribed before me this _____ day of _____, 2012 by

_____.

Personally known _____ OR produced _____
[Type of identification]

_____ My commission expires _____

Notary Public Signature

[Print, type or stamp Commissioned name of Notary Public]

Signatory Requirement - In the case of a business entity other than a partnership or a corporation, this affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, this affidavit shall be executed by the general partner(s). In the case of a corporation, this affidavit shall be executed by the corporate president.

SECTION 00500
**FORM OF AGREEMENT
 BETWEEN THE
 COUNTY OF MANATEE, FLORIDA
 AND THE CONTRACTOR AS IDENTIFIED BELOW
 ON THE BASIS OF A STIPULATED UNIT COST CONTRACT PRICE**

THIS AGREEMENT is made and entered into by and between the COUNTY OF MANATEE, a political subdivision of the state of Florida, hereinafter referred to as the "COUNTY" and _____, hereinafter referred to as the "CONTRACTOR," duly authorized to transact business in the state of Florida, with offices located at _____; mailing address: _____.

Article 1. WORK

CONTRACTOR shall furnish all labor, materials, supplies, and other items required to complete the Work for IFB No. **IFB#11-2454-OV, Cortez Road (SR 684) @ 43rd Street West / Installation of Mast Arm Signals, Bradenton, FL** in strict accordance with Contract Documents and any duly authorized subsequent addenda thereto, all of which are made a part hereof.

Article 2. ENGINEER

The County of Manatee, is responsible as the COUNTY and as "ENGINEER," designed this project and is responsible for technical/engineering reviews and decisions. The ENGINEER is a member of the COUNTY'S project management team which is collectively responsible in ensuring the Work is completed in accordance with the Contract Documents. All communications involving this project will be addressed to Mr. Walter Sowa, Sr. Engineering Specialist and Mr. Larry R. Mau, Project Manager, Cardno, TBE. **All invoices will be addressed to Mr. Walter Sowa with copies of invoices to Mr. Larry R. Mau, Project Manager, Cardno, TBE.**

County of Manatee
 Public Works Department
 Project Management Division
 Attn: Ms. Eyra Cash, P.E.
 Project Engineer II
 IFB#11-2454-OV
 1022 26th Avenue East
 Bradenton, FL 34208
 Phone (941) 708-7450 / Ext. 7344

Cardno TBE
 Attn: Mr. Larry R. Mau, PE
 Project Manager
 22 Sarasota Center Blvd.
 Sarasota, FL 34240
 Phone: (941) 377-9084 / Ext. 233

Where the terms ENGINEER and/or COUNTY are used in the Contract Documents, it shall mean the COUNTY'S project management team.

Article 3. CONTRACTOR'S REPRESENTATIONS

In order to induce COUNTY to enter into this Agreement, CONTRACTOR makes the following representations:

- 3.1 CONTRACTOR has familiarized itself with the nature and extent of the Bid Documents, Work, site, locality and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
- 3.2 CONTRACTOR has studied carefully all drawings of the physical conditions upon which CONTRACTOR is entitled to rely.
- 3.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies which pertain to the physical conditions at or contiguous to the site or which otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Bid Documents; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.
- 3.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Bid Documents with respect to existing underground facilities at or contiguous to the site and assumes responsibility for the accurate location of said underground facilities. Any additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said underground facilities conducted by the CONTRACTOR will be done at the CONTRACTOR'S expense.

- 3.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Bid.
- 3.6 CONTRACTOR has given COUNTY written notice of all conflicts, errors or discrepancies that have been discovered in the Bid Documents and the written resolution thereof by OWNER is acceptable to CONTRACTOR.
- 3.7 CONTRACTOR shall schedule and perform the Work subject to COUNTY'S approval and shall hold COUNTY harmless from all liabilities incurred due to CONTRACTOR'S failure to coordinate with the COUNTY.

Article 4. CONTRACT DOCUMENTS

The Contract Documents which comprise the entire Agreement between COUNTY and CONTRACTOR concerning the Work consist of the following:

- 4.1 This Agreement and Bid Document **IFB#11-2454-OV**
- 4.2 Performance and/or other Bonds and Insurance Certificate(s)
- 4.3 Drawings (not attached)
- 4.4 Addendum number ___ to ___ inclusive.
- 4.5 CONTRACTOR'S Bid Form and any other information submitted by Contractor prior to Notice of Award.

- 4.6 The following which may be delivered or issued after the effective date of the Agreement and are not attached hereto: all written Change Orders and other documents amending, modifying, or supplementing the Contract Documents.
- 4.7 The documents listed in paragraphs above are attached to this Agreement (except as noted otherwise above). There are no Contract Documents other than those listed above in this Article 4.

Article 5. MISCELLANEOUS

- 5.1 Terms used in this Agreement are defined in Article 1 of the General Conditions.
- 5.2 No assignment by a party hereto of any rights under or interest in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law); and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignee from any duty or responsibility under the Contract Documents.
- 5.3 COUNTY and 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 of all covenants, agreements and obligations contained in the Contract Documents.

The OWNER will pay, and the CONTRACTOR will accept in full consideration for the performance of the Work (**IFB No. #11-2454-OV, Cortez Road (SR 684) 43rd Street West / Installation of Mast Arm Signals, Bradenton, FL** subject to additions and deductions as provided therein, the sum of _____Cents (**\$XXXXXX.xx**) for **Bid "X"** based on Completion Time of **XX calendar days** and the sum of **\$X,XXXX.XX** as liquidated damages for each calendar day of delay.

CONTRACTOR

BY: _____
Signature

Name and Title of Signer (printed)

Date: _____

MANATEE COUNTY GOVERNMENT

BY: _____For the County
Signature

Melissa Assha, CPPO, Interim Purchasing Official
Name and Title of Signer

Date: _____

SECTION 00700
GENERAL CONDITIONS

ARTICLE I - DEFINITIONS

Whenever used in the Bid Documents, the following terms have the meaning indicated which are applicable to both the singular and plural thereof:

Addendum - Written or graphic instruments issued prior to the opening of bids which clarify or change the bidding documents or the contract documents.

Agreement - The written Agreement between County and Contractor covering the Work to be performed; other contract documents are attached to the Agreement and made a part thereof as provided therein.

Written Amendment - A written amendment of the contract documents, signed by County and Contractor on or after the effective date of the Agreement and normally dealing with the non-engineering or non-technical rather than strictly work related aspects of the contract documents.

Application for Payment - The form accepted by Project Representative which is to be used by Contractor in requesting progress or final payments and which is to include such supporting documentation as is required by the contract documents.

Award - Acceptance of the bid from the person, firm, or corporation which in the County's sole and absolute judgment will under all circumstances best serve the public interest. Award shall be made by a majority vote of a quorum of Manatee County Board of County Commissioners in open session; or by the Purchasing Official in accordance with Ordinance 09-52, Manatee County Purchasing Ordinance.

Bid - The offer of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

Bidder - One who submits a bid directly to the County, as distinct from a sub-bidder, who submits a bid to a Bidder.

Bidding Documents - Consists of the Invitation For Bid, which includes but is not limited to: the bid form, drawings, Contract Documents, terms and conditions, and the proposed contract documents (including all Addenda issued prior to receipt of bids); and becomes a part of the Agreement.

Bonds - Performance and payment bonds and other instruments of security.

Change Order - A document recommended by Project Representative which is signed by Contractor and County and authorizes an addition, deletion, or revision in the Work or an adjustment in the contract price or the contract time, issued on or after the effective date of the Agreement.

Compensable Delay - Any delay beyond the control and without the fault or negligence of the Contractor resulting from County-caused changes in the Work, differing site conditions, suspensions of the Work, or termination for convenience by County.

Contract Documents - The Agreement, Addenda (which pertain to the contract documents), Contractor's bid (including documentation accompanying the bid and any post-bid documentation submitted prior to the Notice of Award), the bonds, the specifications and the drawings, together with all amendments, modifications and supplements issued on or after the effective date of the Agreement.

Contract Price - The monies payable by County to Contractor under the contract documents as stated in the Agreement.

Contract Time - The number of days or the date stated in the Notice to Proceed for the completion of the Work.

Contractor - The person, firm or corporation with whom County has entered into an Agreement.

Days - All references to days are to be considered calendar days except as specified differently.

Defective - An adjective which when modifying the work refers to work that is unsatisfactory, faulty or deficient, or does not conform to the contract documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the contract documents, or has been damaged prior to Project Representative's recommendation of final payment (unless responsibility for the protection thereof has been assumed by County).

Discretionary - Payment for all work that shall be made only at the County's discretion in order to satisfactorily complete the project in accordance with the Plans and Specifications.

Drawings - The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by Engineer and are referred to in the bidding and contract documents.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective (date of execution).

Excusable Delay - Any delay beyond the control and without the negligence of the Contractor, the County, or any other contractor caused by events or circumstances such as, but not limited to, acts of God or of the public enemy, fires, floods, freight embargoes, acts of government other than County, or epidemics. Labor disputes and above average rainfall shall give rise only to excusable delays.

Float or Slack Time - The time available in the progress schedule during which an unexpected activity can be completed without delaying substantial completion of the Work.

Inexcusable Delay - Any delay caused by events or circumstances within the control of the Contractor, such as inadequate crewing, slow submittals, etc., which might have been avoided by the exercise of care, prudence, foresight, or diligence on the part of the Contractor.

Non-prejudicial Delay - Any delay impacting a portion of the Work within the available total float or slack time and not necessarily preventing completion of the Work within the contract time.

Notice of Award - The written notice to the successful bidder stating Award has been approved by the Board of County Commissioners; or by the Purchasing Official in accordance with Ordinance 09-52, Manatee County Purchasing Code.

Notice of Intent to Award - The written notice to the successful contractor stating Award has been approved by the Purchasing Official in accordance with Manatee Code of Law, Chapter 2-26, Manatee County Purchasing Ordinance.

Notice to Proceed - Written notice by County (after execution of contract) to Contractor fixing the date on which the contract time will commence to run and on which Contractor shall start to perform (ten (10) days from date of such notice) Contractor's obligations under the contract documents.

Owner – Manatee County, Florida, Board of County Commissioners.

Preconstruction Conference - Prior to starting the Work, a meeting scheduled by County with Contractor to review the Work schedules, to establish procedures for handling shop drawings and other submissions, for processing periodical pay estimates, and such other matters as may be pertinent to the project.

Prejudicial Delay - Any excusable or compensable delay impacting the Work and exceeding the total float available in the progress schedule, thus preventing completion of the Work within the contract time unless the Work is accelerated.

Pre-operation Testing - All field inspections, installation checks, water tests, performance tests and necessary corrections required of Contractor to demonstrate that individual components of the work have been properly constructed and do operate in accordance with the contract documents for their intended purposes.

Project - The total construction of which the Work to be provided under the contract documents may be the whole or a part as indicated elsewhere in the contract documents.

Project Representative - The authorized representative of County who is assigned to the project or any part thereof.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Contractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a supplier and submitted by Contractor to illustrate material or equipment for some portion of the Work.

Specifications - Those portions of the contract documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

Subcontractor - An individual or corporation having a direct contact with Contractor or with any other subcontractor for the performance of a part of the Work at the site. Such person or firm has contractual relations with the Contractor, not with the County.

Substantial Completion - The Work (or a specified part thereof) has progressed to the point when, in the opinion of the Engineer as evidenced by Engineer's definitive certificate of Substantial Completion, it is sufficiently complete in accordance with contract documents so that the work can be utilized for the purposes for which it is intended; or if there be no such certificate issued, when final payment is due.

Successful Bidder - The lowest qualified, responsible and responsive bidder to whom an award is made.

Supplier - A manufacturer, fabricator, supplier, distributor, materialman or vendor.

Underground Facilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments and any encasement containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work - Work to be paid for on the basis of unit prices.

Work - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the contract documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the contract documents.

Work Directive Change - A written directive to contractor, issued on or after the effective date of the Agreement and signed by County and recommended by Project Representative ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed or to emergencies. A work directive change may not change the contract price or the contract time; but is evidence that the parties expect that the change directed or documented by a work directive change will be incorporated in a subsequently issued change order following negotiations by the parties as to its effect, if any, on the contract price or contract time.

ARTICLE 2 - PRELIMINARY MATTERS

Computation of Time: When time is referred to in the contract documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or legal holiday, such day will be omitted from the computation.

- 2.1 The Contractor must submit a proposed schedule of the Work at the preconstruction conference. The purpose of this schedule is to enable the County to govern the Work, to protect the functions of the local government and its citizens and to aid in providing appropriate surveillance. The County shall have the right to reschedule work provided such rescheduling is in accord with the remainder of terms of the contract. The schedule shall show, as a minimum, the approximate dates on which each segment of the work is expected to be started and finished, the proposed traffic flows during each month, the anticipated earnings by the Contractor for each month and the approximate number of crews and equipment to be used. The County, after necessary rescheduling and obtaining additional information for specific purposes, shall review and approve the schedule. The Contractor shall also forward to the County, as soon as practicable after the first day of each month, a summary report of the progress of the various parts of the work under the contract, in fabrication and in the field, stating the existing status, estimated time of completion and cause of delay, if any. Together with the summary report, the Contractor shall submit any necessary revisions to the original schedule for the County's review and approval. In addition, more detailed schedules may be required by the County for daily traffic control.
- 2.2 A Notice to Proceed may be given at any time within thirty (30) days after the effective date of the Agreement. The contract time will commence at the time specified in such notice. Contractor shall start to perform the Work on the date specified in the notice to proceed, but no work shall be done at the site prior to the date on which the contract time commences to run.
- 2.3 If at any time the materials and appliances to be used appear to the County as insufficient or improper for securing the quality of work required or the required rate of progress, the County may order the Contractor to increase his efficiency or to improve the character of his work and the Contractor shall conform to such an order. The failure of the County to demand any increase of such efficiency or any improvement shall not release the County from his obligation to secure the quality of work or the rate of progress necessary to complete the Work within the limits imposed by the contract. The County may require the Contractor to remove from the Work such employees as the County deems incompetent, careless, insubordinate or otherwise objectionable, or whose continued employment on the Work is deemed to be contrary to the County's interest.
- 2.4 The County reserves the right to let other Contracts in connection with this Work. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and execution of their Work, and promptly connect and coordinate the Work with theirs.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, RE-USE

- 3.1 The contract documents comprise the entire Agreement between County and Contractor concerning the work. The contract documents are complementary; what is called for by one is as binding as if called for by all. The contract documents will be construed in accordance with the laws and ordinances of the State of Florida and the County of Manatee.

Should a conflict exist within the contract documents, the precedence in ascending order of authority are as follows: 1) Standard Printed Contract Documents, 2) Special Conditions, 3) General Conditions and 4) Drawings. Note: Computed dimensions shall govern over scaled dimensions.

- 3.2 It is the intent of the contract documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the contract documents. Any work, materials or equipment that may reasonably be inferred from the contract documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe work, materials, or equipment, such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of opening of bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the contract documents) shall be effective to change the duties and responsibilities of County, Contractor or Engineer, or any of their agents or employees from those set forth in the Contract Documents.

- 3.3 The contract documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

- 3.3.1 A Formal Written Amendment
- 3.3.2 A Change Order
- 3.3.3 Administrative Contract Adjustment (ACA)

- 3.4 In addition, the requirements of the contract documents may be supplemented and minor variations and deviations in the Work may be authorized in one or more of the following ways:

- 3.4.1 Discretionary Work – Field Directive
- 3.4.2 Engineer's approval of a Shop Drawing or sample.

ARTICLE 4 - CONTRACTOR'S RESPONSIBILITIES

- 4.1 Contractor shall keep on the Work at all times during its progress a competent resident superintendent; who shall be the Contractor's representative at the site and shall have authority to act on behalf of Contractor. All communications given to the superintendent shall be as binding as if given to Contractor.
- 4.2 Contractor shall provide competent, suitable qualified personnel to survey and lay out the Work and perform construction as required by the contract documents. Contractor shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto and except as otherwise indicated in the contract documents, all Work at the site shall be performed during regular working hours and Contractor will not permit overtime work or the performance of work on Saturday, Sunday or legal holiday without County's written consent given after prior notice to Engineer (at least 72 hours in advance).
- 4.2.1 Contractor shall pay for all additional engineering charges to the County for any overtime work which may be authorized. Such additional engineering charges shall be a subsidiary obligation of Contractor and no extra payment shall be made by County on account of such overtime work. At County's option, overtime costs may be deducted from Contractor's monthly payment request or Contractor's retainage prior to release of final payment.
- 4.3 Unless otherwise specified, Contractor shall furnish and assume full responsibility for all bonds, insurance, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.
- 4.4 All materials and equipment shall be of good quality and new, except as otherwise provided in the contract documents. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instruction of the applicable supplier except as otherwise provided in the contract documents.
- 4.5 Contractor shall be fully responsible to County for all acts and omissions of the subcontractors, suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between County or Engineer and any such subcontractor, supplier or other person or organization, nor shall it create any obligation on the part of County to pay or to see to the payment of any monies due any such subcontractor, supplier or other person or organization.

- 4.6 Permits: Unless otherwise provided, Contractor shall obtain and pay for all construction permits and licenses. County shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work.
- 4.7 During the progress of the Work, Contractor shall keep the premises free from accumulation of waste materials rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials and shall leave the site clean and ready for occupancy by County. Contractor shall restore to original conditions all property not designated for alteration by the Contract Documents.
- 4.8 Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.
- 4.9 **Safety and Protection:** Contractor shall comply with the Florida Department of Commerce Safety Regulations and any local safety regulations. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to:
- 4.9.1 all employees on the work and other persons and organizations who may be affected thereby;
 - 4.9.2 all the work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
 - 4.9.3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of construction.

Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall provide and maintain all passageways, guard fences, lights and other facilities for the protection required by public authority or local conditions. Contractor shall provide reasonable maintenance of traffic way for the public and preservation of the County's business, taking into full consideration all local conditions. Contractor's duties and responsibilities for the safety and protection of the work shall continue until such time as all the work is completed.

- 4.10 Emergencies: In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, Contractor, without special instruction or authorization from Engineer or County, is obligated to act to prevent threatened damage, injury or loss. Contractor shall give County prompt written notice if Contractor believes that any significant changes in the work or variations from the contract documents have been caused thereby. If Owner determines that a change in the contract documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variation.
- 4.11 For substitutes not included with the bid, but submitted after the effective date of the Agreement, Contractor shall make written application to Engineer for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will also contain an itemized estimate of all costs and delays or schedule impacts that will result directly or indirectly from review, acceptance and provisions of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by the Engineer in evaluating the proposed substitute. Engineer may require Contractor to furnish at Contractor's expense, additional data about the proposed substitute. In rendering a decision, County/Engineer and Contractor shall have access to any available float time in the construction schedule. In the event that substitute materials or equipment not included as part of the bid, but proposed after the effective date of the agreement, are accepted and are less costly than the originally specified materials or equipment, then the net difference in cost shall be credited to the County and an appropriate change order executed.
- 4.11.1 If a specific means, method, technique, sequence of procedure of construction is indicated in or required by the contract documents, Contractor may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to Engineer if Contractor submits sufficient information to allow Engineer to determine that the substitute proposed is equivalent to that indicated or required by the contract documents.
- 4.11.2 Engineer will be allowed a reasonable time within which to evaluate each proposed substitute. Engineer will be the sole judge of acceptability and no substitute will be ordered, installed or utilized without Engineer's prior written acceptance which will be evidenced by either a change order or an approved shop drawing. County may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- 4.11.3 Contractor shall reimburse County for the charges of Engineer and Engineer's Consultants for evaluating each proposed substitute submitted after the effective date of the Agreement and all costs resulting from any delays in the work while the substitute was undergoing review.

- 4.12 The Contractor shall furnish, free of charge, all labor, stakes, surveys, batter boards for structures, grade lines and other materials and supplies and shall set construction stakes and batter boards for establishing lines, position of structures, slopes and other controlling points necessary for the proper prosecution of the construction work. Where rights-of-way, easements, property lines or any other conditions which make the lay-out of the project or parts of the project critical are involved, the Contractor will employ a competent surveyor who is registered in the State of Florida for lay-out and staking. These stakes and marks shall constitute the field control by and in accord with which the Contractor shall govern and execute the work. The Contractor will be held responsible for the preservation of all stakes, marks and if for any reason any of the stakes or marks or batter boards become destroyed or disturbed, they will be immediately and accurately replaced by the Contractor.
- 4.13 The Contractor has, by careful examination, satisfied himself as to the nature and location of the work and all other matters which can in any way affect the work under this contract, including, but not limited to details pertaining to boring, as shown on the drawings, are not guaranteed 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. In no event shall an extension of time be considered for any conditions that existed at the time of bidding, nor shall the Contractor receive extra compensation for completion of the project as intended by the drawings and in keeping with the contract documents. No verbal agreement or conversation with any officer, agent or employee of the County, before or after the execution of this contract, shall affect or modify any of the terms or obligations herein contained.
- 4.14 If the Contractor, in the course of the work, finds that the drawings and/or Contract Documents cannot be followed, he shall immediately inform the County in writing, and the County shall promptly check the accuracy of the information. Any work done after such discovery, until any necessary changes are authorized, will be done at the Contractor's risk.

ARTICLE 5 - OWNER'S RESPONSIBILITIES

- 5.1 County shall furnish the data required of County under the contract documents promptly and shall make payments to the Contractor within a reasonable time (no more than 45 days) after the Work has been accepted by the County. The form of all submittals, notices, change orders and other documents permitted or required to be used or transmitted under the contract documents shall be determined by the County/Engineer. Standard County forms shall be utilized.
- 5.2 The County shall provide the lands upon which the Work under this contract is to be done, except that the Contractor shall provide all necessary additional land required for the erection of temporary construction facilities and storage of his materials, together with right of access to same.

- 5.3 The County shall have the right to take possession of and use any completed portions of the work, although the time for completing the entire work or such portions may not have expired, but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents.

ARTICLE 6 - CHANGES IN THE WORK

- 6.1 Without invalidating the Agreement and without notice to any surety, County may, at any time, order additions, deletions or revisions in the Work. These will be authorized by a written amendment, a change order, or a work directive change. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the contract documents (except as otherwise specifically provided).
- 6.2 Contractor shall not be entitled to an increase in the contract price or an extension of the contract time with respect to any Work performed that is not required by the contract documents as amended, modified and supplemented.
- 6.3 County and Contractor shall execute appropriate change orders (or written amendments) covering changes in the Work which are ordered by County, or which may be required because of acceptance of defective Work.
- 6.4 At any time Engineer may request a quotation from Contractor for a proposed change in the Work and within twenty-one (21) calendar days after receipt, Contractor shall submit a written and detailed proposal for an increase or decrease in the contract price or contract time for the proposed change. Engineer shall have 21 calendar days after receipt of the detailed proposal to respond in writing. The proposal shall include an itemized estimate of all costs and time for performance that will result directly or indirectly from the proposed change. Unless otherwise directed, itemized estimates shall be in sufficient detail to reasonably permit an analysis by Engineer of all material, labor, equipment, subcontracts, overhead costs and fees, and shall cover all Work involved in the change, whether such Work was deleted, added, changed or impacted. Notwithstanding the request for quotation, Contractor shall carry on the Work and maintain the progress schedule. Delays in the submittal of the written and detailed proposal will be considered non-prejudicial.

ARTICLE 7 - CHANGE OF CONTRACT PRICE

- 7.1 The contract price constitutes the total compensation (subject to authorized adjustments) payable to Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at his expense without change in the contract price.
- 7.2 The contract price may only be changed by change order or by a written amendment. Any claim for an increase or decrease in the contract price shall be based on written notice delivered by the party making the claim to the other party. Notice of the amount of the claim with supporting data shall be delivered within ten (10) days from the beginning of such occurrence and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event.

- 7.3 The value of any Work covered by a change order or of any claim for an increase or decrease in the contract price shall be determined in one of the following ways (at County's discretion):
- 7.3.1 Where the Work involved is covered by unit prices contained in the contract documents, cost will be determined by application of such unit prices to the quantities of the items involved.
 - 7.3.2 By mutual acceptance of lump sum.
 - 7.3.3 On the basis of the cost of the Work, plus a 20% Contractor's fee for overhead and profit. (Contractor shall submit an itemized cost breakdown together with supporting data.)
- 7.4 Either County or Contractor may make a claim for an adjustment in the contract price. The unit price of an item of unit price Work shall be subject to re-evaluation and adjustment under the following conditions:
- 7.4.1 If the total cost of a particular item of unit price Work amounts to 5% or more of the contract price and the variation in the quantity of the particular item of unit price Work performed by Contractor differs by more than 15% from the estimated quantity of such item indicated in the Agreement; and
 - 7.4.2 If there is no corresponding adjustment with respect to any other item of Work; and
 - 7.4.3 If a Contractor believes that it has incurred additional expense as a result thereof; or
 - 7.4.4 If County believes that the quantity variation entitles it to an adjustment in the unit price; or
 - 7.4.5 If the parties are unable to agree as to the effect of any such variations in the quantity of unit price Work performed.

ARTICLE 8 - CHANGE OF CONTRACT TIME

- 8.1 Contract time may only be changed by a change order or a written amendment. Any claim for an extension or shortening of the contract time shall be based on written notice delivered by the party making the claim to the other party. Notice of the extent of the claim with supporting data shall be delivered within fifteen (15) days from detection or beginning of such occurrence and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event.

- 8.2 The contract time will be extended in an amount equal to time lost due to delays beyond the control of Contractor. Such delays shall include, but not be limited to, acts or neglect by County or others performing additional work; or to fires, floods, epidemics, abnormal weather conditions or acts of God.
- 8.3 All time limits stated in the contract documents are of the essence.

ARTICLE 9 - WARRANTY, TEST/INSPECTION, CORRECTION

- 9.1 Contractor warrants (for a minimum period of three years or as otherwise stated herein) and guarantees to County that all work will be in accordance with the contract documents and will not be defective; that County, representatives of County, governmental agencies with jurisdictional interests will have access to the work at reasonable time for their observation, inspecting and testing (Contractor shall give Engineer timely notice of readiness of the work for all required approvals and shall assume full responsibility, including costs, in obtaining required tests, inspections, and approval certifications and/or acceptance, unless otherwise stated by County).
- 9.2 If any work (including work of others) that is to be inspected, tested, or approved is covered without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation. Such uncovering shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice. Neither observations by Engineer nor inspections, tests, or approvals by others shall relieve Contractor from Contractor's obligations to perform the work in accordance with the contract documents.
- 9.3 If the work is defective, or Contractor fails to supply sufficient skilled workers, or suitable materials or equipment, or fails to furnish or perform the work in such a way that the completed work will conform to the contract documents, County may order Contractor to stop the work, or any portion thereof and terminate payments to the Contractor until the cause for such order has been eliminated. Contractor shall bear all direct, indirect and consequential costs for satisfactory reconstruction or removal and replacement with non-defective work, including, but not limited to fees and charges of engineers, architects, attorneys and other professionals and any additional expenses experienced by County due to delays to other Contractors performing additional work and an appropriate deductive change order shall be issued. Contractor shall further bear the responsibility for maintaining schedule and shall not be entitled to an extension of the contract time and the recovery of delay damages due to correcting or removing defective work.
- 9.3.1 If Contractor fails within seven (7) days after written notice to correct defective work, or fails to perform the work in accordance with the contract documents, or fails to comply with any other provision of the contract documents, County may correct and remedy any such deficiency. To the extent necessary to complete corrective and remedial action, County may exclude Contractor from all or part of the site, take possession of all or part of the work, Contractor's tools, construction equipment and machinery at the site or for which County has paid

Contractor but which are stored elsewhere. All direct, indirect and costs of County in exercising such rights and remedies will be charged against Contractor in an amount approved as to reasonableness by Engineer and a change order will be issued incorporating the necessary revisions.

- 9.3.2 If within three years after the date of completion or such longer period of time as may be prescribed by laws or regulations or by the terms of any applicable special guarantee required by the contract documents, any work is found to be defective, Contractor shall promptly, without cost to County and in accordance with County's written instructions, either correct such defective work or if it has been rejected by County, remove it from the site and replace it with non-defective work. If Contractor does not promptly comply with the terms of such instruction, County may have the defective work corrected/removed and all direct, indirect and consequential costs of such removal and replacement will be paid by Contractor.

ARTICLE 10 - SUSPENSION/TERMINATION OF WORK

- 10.1 County may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety (90) days by written notice to Contractor, which will fix the date on which work will be resumed. Contractor shall be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to any suspension if Contractor makes an approved claim therefore.
- 10.2 County may terminate the contract if Contractor commences a voluntary case under any chapter of the Bankruptcy Code or any similar action by filing a petition under any other federal or state law relating to the bankruptcy or insolvency; if a petition is filed against the Contractor under any chapter of the Bankruptcy Code or similar relief under any other federal or state law; if Contractor persistently fails to perform the work in accordance with the contract documents; if Contractor disregards laws or regulations of any public body having jurisdiction or the Engineer; or otherwise violates in any substantial way any provisions of the contract.
- 10.2.1 County may, after giving Contractor (and the surety, if there is one) seven (7) days written notice and to the extent permitted by laws and regulations, terminate the services of Contractor; exclude Contractor from the site and take possession of the work and of all Contractor's tools, construction equipment and machinery at the site and use the same to the full extent they could be used (without liability to Contractor for trespass or conversion); incorporate in the work all materials and equipment stored at the site or for which county has paid Contractor but which are stored elsewhere, and finish the work as County may deem expedient. In such case, Contractor shall not be entitled to receive any further payment beyond an amount equal to the value of material and equipment not incorporated in the work, but delivered and suitably stored, less the aggregate of payments previously made. If the direct and indirect costs of completing the work exceed the unpaid balance of the contract price, Contractor shall pay the difference to County. Such costs incurred by County shall be verified by County and incorporated in

a change order; but in finishing the work, County shall not be required to obtain the lowest figure for the work performed. Contractor's obligations to pay the difference between such costs and such unpaid balance shall survive termination of the Agreement.

- 10.3 If, through no act or fault of Contractor, the work is suspended for a period of more than ninety (90) days by County or under an order of court or other public authority, or Engineer fails to act on any application or fails to pay Contractor any sum finally determined to be due; then Contractor may, upon seven (7) days written notice to County terminate the Agreement and recover from County payment for all work executed, any expense sustained plus reasonable termination expenses. In lieu of terminating the Agreement, if Engineer has failed to act on any application of payment or County has failed to make any payment as aforesaid, Contractor may upon seven (7) days written notice to County stop the work until payment of all amounts then due.

ARTICLE 11 - CONTRACT CLAIMS

- 11.1 The rendering of a decision by Engineer with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment) will be a condition precedent to any exercise by County or Contractor of such right or remedies as either may otherwise have under the contract documents or by laws or regulations in respect of any such claim, dispute or other matter. No action, either at law or at equity, shall be brought in connection with any such claim, dispute or other matter later than thirty (30) days after the date on which County/Engineer has rendered such written decision in respect thereof. Failure to bring an action within said thirty (30) day period shall result in Engineer's decision being final and binding on the Contractor. In no event may any such action be brought after the time at which instituting such proceedings would be otherwise barred by the applicable statute of limitations.
- 11.2 Before bringing any action in court pertaining to any claim, dispute or other matter in question(s) arising out of or relating to the contract documents or the breach thereof, or Engineer's final decision, except for claims which have been waived by the making and acceptance of final payment, the Contractor shall first submit written notice(s) of contract claims to the Purchasing Official for a decision within the earlier of sixty (60) days after the last date on which the contractor provided any goods or services required by the contract or after the date on which the contractor knew or should have known such a claim existed. The Manatee County Code of Law section 2-26-63 Contract Claims details the requirements and process for such a claim.

ARTICLE 12 - RESIDENT PROJECT REPRESENTATIVE - DUTIES, RESPONSIBILITIES

- 12.1 Resident Project Representative is Engineer/County's Agent, who will act as directed by and under the supervision of the Engineer, and who will confer with County/Engineer regarding his actions. Resident Project Representative's dealing in matters pertaining to the on-site work shall, in general, be only with the County/Engineer and Contractor and dealing with subcontractors shall only be through or with the full knowledge of Contractor.

12.2 Resident Project Representative will:

- 12.2.1 Review the progress schedule, schedule of shop drawing submissions and schedule of values prepared by Contractor and consult with County/Engineer concerning their acceptability.
- 12.2.2 Attend preconstruction conferences. Arrange a schedule of progress meetings and other job conferences as required in consultation with County/Engineer and notify those expected to attend in advance. Attend meetings and maintain and circulate copies of minutes thereof.
- 12.2.3 Serve as County/Engineer's liaison with Contractor, working principally through Contractor's superintendent and assist him in understanding the intent of the contract documents. As requested by County/Engineer, assist in obtaining additional details or information when required at the job site for proper execution of the Work.
- 12.2.4 Receive and record date of receipt of shop drawings and samples, receive samples which are furnished at the site by Contractor and notify County/Engineer of their availability for examination.
- 12.2.5 Advise County/Engineer and Contractor or his superintendent immediately of the commencement of any work requiring a shop drawing or sample submission if the submission has not been approved by the County/Engineer.
- 12.2.6 Conduct on-site observations of the work in progress to assist County/Engineer in determining if the work is proceeding in accordance with the contract documents and that completed work will conform to the contract documents.
- 12.2.7 Report to County/Engineer whenever he believes that any work is unsatisfactory, faulty or defective or does not conform to the contract documents, or does not meet the requirements of any inspections, tests or approvals required or if work has been damaged prior to final payment; and advise County/Engineer when he believes work should be corrected or rejected or should be uncovered of observation or requires special testing, inspection or approval.
- 12.2.8 Verify that tests, equipment and system start-ups and operating and maintenance instructions are conducted as required by the contract documents and in the presence of the required personnel, and that Contractor maintains adequate records thereof; observe, record and report to Engineer appropriate details relative to the test procedures and start-ups.

- 12.2.9 Accompany visiting inspectors representing public or other agencies having jurisdiction over the project; record the outcome of these inspections and report to County/Engineer.
- 12.2.10 Transmit to Contractor, County/Engineer's clarifications and interpretations of the contract documents.
- 12.2.11 Consider and evaluate Contractor's suggestions or modifications in drawings or Contract Documents and report them with recommendations to County/Engineer.
- 12.2.12 Maintain at the job site orderly files for correspondence, reports of job conferences, shop drawings and sample submissions, reproductions of original contract documents including all addenda, change orders, field orders, additional drawings issued subsequent to the execution of the contract, County/Engineer's clarifications and interpretations of the contract documents, progress reports and other project related documents.
- 12.2.13 Keep a diary or log book, recording hours on the job site, weather conditions, data relative to questions of extras or deductions; list of visiting officials and representatives or manufacturers, fabricators, suppliers and distributors; daily activities, decisions, observations in general and specific observations in more detail as in the case of observing test procedures. Send copies to County/Engineer.
- 12.2.14 Record names, addresses and telephone numbers of all Contractors, subcontractors and major suppliers of materials and equipment.
- 12.2.15 Furnish County/Engineer periodic reports as required of progress of the work and Contractor's compliance with the approved progress schedule and schedule of shop drawing submissions.
- 12.2.16 Consult with County/Engineer in advance of scheduling major tests, inspections or start of important phases of the work.
- 12.2.17 Report immediately the occurrence of any accident.
- 12.2.18 Review applications for payment with Contractor for compliance with the established procedure for their submission and forward them with recommendations to County/Engineer, noting particularly their relation to the schedule of values, work completed and materials and equipment delivered at the site but not incorporated in the work.
- 12.2.19 During the course of the work, verify that certificates, maintenance and operations manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed, and deliver this material to County/Engineer for his review prior to final acceptance of the work.

- 12.2.20 Before County/Engineer issues a Certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.
- 12.2.21 Conduct final inspection in the company of County/Engineer and Contractor and prepare a final list of items to be completed or corrected.
- 12.2.22 Verify that all items on final list have been completed or corrected and make recommendations to County/Engineer concerning acceptance.
- 12.3 Except upon written instructions of County/Engineer, Resident Project Representative.
- 12.3.1 Shall not authorize any deviation from the contract documents or approve any substitute materials or equipment;
- 12.3.2 Shall not exceed limitations on County/Engineer's authority as set forth in the contract documents;
- 12.3.3 Shall not undertake any of the responsibilities of Contractor, Subcontractors or Contractor's Superintendent, or expedite the work;
- 12.3.4 Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in the contract documents;
- 12.3.5 Shall not advise on or issue directions as to safety precautions and programs in connection with the work;
- 12.3.6 Shall not authorize County to occupy the project in whole or in part; and
- 12.3.7 Shall not participate in specialized field or laboratory tests.

ARTICLE 13 - APPRENTICES

- 13.1 In accordance with the requirement of Section 446.011, Florida Statutes, the following requirements to safeguard the welfare of apprentices and trainees shall be a part of this contract, if applicable.
 - 13.1.1 Contractor agrees to hire for the performance of the contract, a number of apprentices or trainees in each occupation which bears to the average number of the journeymen in that occupation to be employed in the performance of the contract, the ratio of at least one apprentice or trainee to every five journeymen.
 - 13.1.2 Contractor agrees, when feasible to assure that 25% of such apprentices or trainees are in their first year of training, except when the number of apprentices or trainees to be hired is fewer than four.

- 13.1.3 Contractor agrees to submit, at three month intervals, to the Bureau of Apprenticeship of the Division of Labor, records of employment by trade of the number of apprentices or trainees employed; race of all apprentices; the number of apprentices or trainees in their first year of training; and total hours of work of all apprentices, trainees, and journeymen.
- 13.1.4 Contractor agrees to submit to the Bureau of Apprenticeship of the Division of Labor, at three month intervals, a statement describing steps taken toward making a diligent effort in the hiring of apprentices and trainees and containing a breakdown by craft of hours worked and wages paid for first year apprentices or trainees, other apprentices or trainees and journeymen.

NOTE: The form of all submittals, notices, change orders and other documents permitted or required to be used or transmitted under the Contract shall be determined by the County. Standard County forms shall be utilized.

END OF SECTION

Name: Cortez Road @ 43rd Street West / Project #:425530-1
IFB No. 11-2454-OV (Project File: 6076860 / 6.2)
Revised: August 4, 2011 / November 2, 2011

FLORIDA DEPARTMENT OF TRANSPORTATION
(Construction Contract)
LOCAL AGENCY PROGRAM SUPPLEMENTAL CONDITIONS

The supplemental conditions contained in this section are intended to cooperate with, to supplement, and to modify the general conditions and other specifications. In case of disagreement with any other section of this contract, the Supplemental Conditions shall govern.

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1. Bonding and Prequalification

Upon award, furnish to the Agency, and maintain in effect throughout the life of the Contract, an acceptable surety bond in a sum at least equal to the amount of the Contract. Execute such bond on the form furnished by the Agency. Obtain a surety that has a resident agent in the State of Florida, meets all of the requirements of the laws of Florida and the regulations of the Agency, and has the Agency's approval. Ensure that the surety's resident agent's name, address and telephone number is clearly stated on the face of the Contract Bond.

A contractor desiring to bid for the performance of any construction contract located on the National Highway System (NHS) or the State Highway System (SHS) in excess of \$250,000 must be certified by the Department of Transportation as qualified in accordance with Section 337.14(1), Florida Statutes and Rule 14-22, Florida Administrative Code. Any bid for the performance of any construction contract in excess of \$250,000 submitted by a contractor not certified by the Department of Transportation as qualified shall be declared "IRREGULAR" and will be REJECTED.

2.&10. Buy America and Foreign Contractor and Supplier Restriction

6-12.2 Source of Supply - Steel (Federal-Aid Contracts Only): For Federal-aid Contracts, only use steel and iron produced in the United States, in accordance with the Buy America provisions of 23 CFR 635.410, as amended. Ensure that all manufacturing processes for this material occur in the United States. As used in this specification, a manufacturing process is any process that modifies the chemical content, physical shape or size, or final finish of a product beginning with the initial melting and mixing and continuing through the bending and coating stages. A manufactured steel or iron product is complete only when all grinding, drilling, welding, finishing and coating have been completed. If a domestic product is taken outside the United States for any process, it becomes foreign source material. When using steel and iron as a component of any manufactured product incorporated into the project (e.g., concrete pipe, pres-stressed beams, corrugated steel pipe, etc.), these same provisions apply, except that the manufacturer may use minimal quantities of foreign steel and iron when the cost of such foreign materials does not exceed 0.1% of the total Contract amount or \$2,500.00, whichever is greater. These requirements are applicable to all steel and iron materials incorporated into the finished work, but are not applicable to steel and iron items that the Contractor uses but does not incorporate into the finished work. Provide a certification from the producer of steel or iron, or any product containing steel or iron as a component, stating that all steel or iron furnished or incorporated into the furnished product was manufactured in the United States in accordance with the requirements of this specification and the Buy America provisions of 23 CFR 635.410, as amended. Such certification shall also include (1) a statement that the product was produced entirely within the United States, or (2) a statement that the product was produced within the United States except for minimal quantities of foreign steel and iron valued at \$(actual value). Furnish each such certification to the Engineer prior to incorporating the material into the project. When FHWA allows the use of foreign steel on a project, furnish invoices to document the cost of such material, and obtain the Engineer's written approval prior to incorporating the material into the project.

3. Change Orders

Contractor shall not be entitled to an increase in the contract price or an extension of the contract time with respect to any Work performed that is not required by the contract documents as amended, modified and supplemented.

Owner and Contractor shall execute appropriate change orders (or written amendments) covering changes in the Work which are ordered by Owner, or which may be required because of acceptance of defective Work.

At any time Engineer may request a quotation from Contractor for a proposed change in the Work and within twenty-one (21) calendar days after receipt, Contractor shall submit a written and detailed proposal for an increase or decrease in the contract price or contract time for the proposed change. Engineer shall have 21 calendar days after receipt of the detailed proposal to respond in writing. The proposal shall include an itemized estimate of all costs and time for performance that will result directly or indirectly from the proposed change. Unless otherwise directed, itemized estimates shall be in sufficient detail to reasonably permit an analysis by Engineer of all material, labor, equipment, subcontracts, overhead costs and fees, and shall cover all Work involved in the change, whether such Work was deleted, shall carry on the Work and maintain the progress schedule. Delays in the submittal of the written and detailed proposal will be considered non-prejudicial. The contract price constitutes the total compensation (subject to authorized adjustments) payable to Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at his expense without change in the contract price.

The contract price may only be changed by change order or by a written amendment. Any claim for an increase or decrease in the contract price shall be based on written notice delivered by the Party making the claim to the other party. Notice of the amount of the claim with supporting data shall be delivered within ten (10) days from the beginning of such occurrence and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event.

The value of any Work covered by a change order or for any claim for an increase or decrease in the contract price shall be determined in one of the following ways (at County's discretion):

Where the Work involved is covered by unit prices contained in the contract documents, cost will be determined by application of such unit prices to the quantities of the items involved.

By mutual acceptance of lump sum.

On the basis of the cost of the Work, plus a 20% Contractor's fee for overhead and profit. (Contractor shall submit an itemized cost breakdown together with supporting data.)

Either Owner or Contractor may make a claim for an adjustment in the contract price. The unit price of an item of unit price Work shall be subject to re-evaluation and adjustment under the following conditions:

If the total cost of a particular item of unit price Work amounts to 5% or more of the contract price and the variation in the quantity of the particular item of unit price Work performed by Contractor differs by more than 15% from the estimated quantity of such item indicated in the Agreement; and

If there is no corresponding adjustment with respect to any other item of Work; and

If a Contractor believes that it has incurred additional expense as a result thereof; or

If Owner believes that the quantity variation entitles it to an adjustment in the unit price; or

If the parties are unable to agree as to the effect of any such variations in the quantity of unit price Work performed.

4. Claims

The rendering of a decision by Engineer with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment) will be a condition precedent to any exercise by Owner or Contractor of such right or remedies as either may otherwise have under the contract documents or by laws or regulations in respect of any such claim, dispute or other matter. No action, either at law or at equity, shall be brought in connection with any such claim, dispute or other matter later than thirty (30) days after the date on which Owner/Engineer has rendered such written decision in respect thereof. Failure to bring an action within said thirty (30) day period shall result in Engineer's decision being final and binding on the Contractor. In no event may any such action be brought after the time at which instituting such proceedings would be otherwise barred by the applicable statute of limitations. Before bringing any action in court pertaining to any claim, dispute or other matter in question(s) arising out of or relating to the contract documents or the breach thereof, or Engineer's final decision, except for claims which have been waived by the making and acceptance of final payment, the Contractor shall first submit written notice(s) of contract claims to the Purchasing Director for a decision' the Contractor may request a conference with the Purchasing Director. Claims include, without limitation, disputes arising under the contract and those based upon breach of contract, mistake, misrepresentation, or other cause for contract modification or revision. The Purchasing Director is authorized to resolve any claim prior to the filing of a request for a hearing

with the Board of County Commissioners or the commencement of an action in a court of competent jurisdiction; but may not settle any such claim for consideration of \$10,000.00 or more in value without the prior approval of the Board of County Commissioners.

The decision of the Purchasing Director shall be promptly issued in writing to the Contractor. If an adverse decision has been rendered, the notice of decision shall inform the Contractor of his right to request a hearing with the Board of County Commissioners.

The Purchasing Director's decision shall be final and conclusive unless, within ten (10) calendar days from the date of receipt of the decision, the Contractor files a written request for hearing with the Board of County Commissioners.

If the Purchasing Director does not issue a written decision regarding any contract controversy within fourteen (14) days after receipt of a written request for a final decision, or within such longer period as may be agreed upon between the parties, then the aggrieved party may proceed as if an adverse decision had been issued.

5. Contractor Purchased Equipment for State or Local Ownership

The OWNER does not allow.

6. Disadvantage Business Enterprise (DBE)

General: Prior to award of the Contract, have an approved Disadvantaged Business Enterprise (DBE) Affirmative Action Program Plan filed with the Equal Opportunity Office. Update and resubmit the plan every three years. No Contract will be awarded until the Department (FDOT) approves the plan. The DBE Affirmative Action Program Plan and commitment to carry out the Plan must be incorporated into and become a part of the awarded Contract. **Effective October 1, 2011, the new DBE goal will be 8.60%. This will be in place until September 30, 2014.**

Required Contract and Subcontract DBE Assurance Language: Per 49 CFR 26.13 (b) each Contract FDOT signs with a Contractor (and each subcontract the prime contractor signs with a subcontractor) must include the following assurance: "The Contractor, sub-recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted Contracts. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the recipient deems appropriate."

Plan Requirements: Include the following in the DBE Affirmative Action Program Plan:

(a) A policy statement, expressing a commitment to use DBEs in all aspects of contracting to the maximum extent feasible. The policy making body must issue a policy statement signed by the chairperson, which expresses its commitment to utilize DBEs,

outlines the various levels of responsibility, and states the objectives of the program. Circulate the policy statement throughout the Contractor's organization.

(b) The designation of a Liaison Officer within the Contractor's organization, as well as support staff, necessary and proper to administer the program, and a description of the authority, responsibility, and duties of the Liaison Officer and support staff. The Liaison Officer and staff are responsible for developing, managing, and implementing the program on a day-to-day basis for carrying out technical assistance activities for DBEs and for disseminating information on available business opportunities so that DBEs are provided an equitable opportunity to participate in Contracts let by the Department.

Use techniques to facilitate DBE participation in contracting activities which include, but are not limited to:

1. Soliciting price quotations and arranging a time for the review of plans, quantities, specifications, and delivery schedules, and for the preparation and presentation of quotations.

2. Providing assistance to DBEs in overcoming barriers such as the inability to obtain bonding, financing, or technical assistance.

3. Carrying out information and communication programs or workshops on contracting procedures and specific contracting opportunities in a timely manner, with such programs being bilingual where appropriate.

4. Encouraging eligible DBEs to apply for certification with the FDOT.

5. Contacting Minority Contractor Associations and city and county agencies with programs for disadvantaged individuals for assistance in recruiting and encouraging eligible DBE contractors to apply for certification with the FDOT.

DBE Records and Reports: Submit the Anticipated DBE Participation Statement at or before the Pre-Construction Conference. Report monthly, through the Equal Opportunity Reporting System on the FDOT's Website, actual payments, (including retainage) made to DBEs for work performed with their own workforce and equipment in the area in which they are certified. Report payments made to all DBE and Minority Business Enterprise (MBE) subcontractors and DBE and MBE construction material and major suppliers. The Equal Opportunity Office will provide instruction on accessing this system. Develop a record keeping system to monitor DBE affirmative action efforts which include the following:

- (a) the procedures adopted to comply with these Specifications;

- (b) the number of subordinated Contracts on FDOT projects awarded to DBEs;

- (c) the dollar value of the Contracts awarded to DBEs;

- (d) the percentage of the dollar value of all subordinated Contracts awarded to DBEs as a percentage of the total Contract amount;

- (e) a description of the general categories of Contracts awarded to DBEs; and

- (f) the specific efforts employed to identify and award Contracts to DBEs.

Upon request, provide the records to the FDOT for review.

All such records are required to be maintained for a period of five years following acceptance of final payment and have them available for inspection by the FDOT and the Federal Highway Administration.

Counting DBE Participation and Commercially Useful Functions: 49 CFR Part 26.55 specifies when DBE credit shall be awarded for work performed by a DBE. DBE credit can only be awarded for work actually performed by DBEs themselves for the types of work for which they are certified. On the Anticipated DBE Participation Statement only include the dollars that a DBE is expected to earn for work they perform with their own workforce and equipment. Submit a revised Anticipated DBE Participation State to reflect changes to the initial Anticipated DBE Participation Statement within 14 business days from the date of the change.

When a DBE participates in a contract, the value of the work is determined in accordance with 49 CFR Part 26.55, for example:

- (a) The Department will count only the value of the work performed by the DBE toward DBE goals. The entire amount of the contract that is performed by the DBE's own forces (including the cost of supplies, equipment and materials obtained by the DBE for the contract work) will be counted ad DBE credit.
- (b) The Department will count the entire amount of fees or commissions charged by the DBE firm for providing bona fide service, such as professional, technical, consultant, or managerial services or for providing bonds or insurance specifically required for the performance of a Department-assisted contract, toward DBE goals, provided that the Department determines the fees to be reasonable and not excessive as compared with fees customarily followed for similar services.
- (c) When the DBE subcontracts part of the work of its contract to another firm, the Department will count the value of the subcontracted work only if the DBE's subcontractor is itself a DBE. Work that a DBE subcontracts to a non-DBE firm does not count toward DBE goals.
- (d) When a DBE performs as a participant in a joint venture, the Department will count the portion of the dollar value of the contract equal to the distinct, clearly defined portion of the work the DBE performs with its own forces toward DBE goals.
- (e) The Contractors shall ensure that only expenditures to DBEs that perform a commercially useful function in the work of a contract may be counted toward the voluntary DBE goal.
- (f) A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price,

- determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself.
- (g) To determine whether a DBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work and other relevant factors.
 - (h) A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.
 - (i) If a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of its contract with its own workforce, or if the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, the DBE has not performed a commercially useful function.

7. On-The Job Training Requirements

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeymen in the type(s) of trade or job classification(s) involved in the work. In the event the Contractor subcontracts a portion of the contract work, he/she shall determine how many, if any, of the trainees are to be trained by the subcontractor provided, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this Section. The Contractor shall apply the requirements of this Section to such subcontract. Where feasible, 25% of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees will be estimated on the number of calendar days of the contract, the dollar value, and the scope of work to be performed. The trainee goal will be finalized at the Post-Preconstruction Trainee Evaluation Meeting and the goal will be distributed among the work classifications based on the following criteria:

- 1) Determine the number of trainees on Federal Aid Contract:
 - (a) No trainees will be required for contracts with a contract time allowance of less than 225 calendar days.
 - (b) If the contract time allowance is 225 calendar days or more, the number of trainees shall be established in accordance with the following chart:

Estimated Contract Amount	Trainees Required
Under \$1,000,000	0
Over \$1,000,000 to \$4,000,000	2
Over \$4,000,000 to \$6,000,000	3
Over \$6,000,000 to \$12,000,000	5
Over \$12,000,000 to \$18,000,000	7
Over \$18,000,000 to \$24,000,000	9
Over \$24,000,000 to \$31,000,000	12
Over \$31,000,000 to \$37,000,000	13
Over \$37,000,000 to \$43,000,000	14
Over \$43,000,000 to \$49,000,000	15
Over \$49,000,000 to \$55,000,000	16
Over \$55,000,000 to \$62,000,000	17
Over \$62,000,000 to \$68,000,000	18
Over \$68,000,000 to \$74,000,000	19
Over \$74,000,000 to \$81,000,000	20
Over \$81,000,000 to \$87,000,000	21
Over \$87,000,000 to \$93,000,000	22
Over \$93,000,000 to \$99,000,000	23
Over \$99,000,000 to \$105,000,000	24
Over \$105,000,000 to \$112,000,000	25
Over \$112,000,000 to \$118,000,000	26
Over \$118,000,000 to \$124,000,000	27
Over \$124,000,000 to \$130,000,000	28
Over \$130,000,000*	
*One additional trainee per \$6,000,000 of estimated Construction Contract amount over \$130,000,000	

Further, if the Contractor or subcontractor requests to utilize banked trainees as discussed later in this Section, a Banking Certificate will be validated at this meeting allowing credit to the Contractor for previously banked trainees. Banked credits of prime Contractors working as Subcontractors may be accepted for credit. The Contractor's Project Manager, the Construction Project Engineer and the Department's District Contract Compliance Manager will attend this meeting. Within ten days after the Post-Preconstruction Training Evaluation Meeting, the Contractor shall submit to the Department for approval an On-The Job Training Schedule indicating the number of trainees to be trained in each selected classification and the portion of the contract time during which training of each trainee is to take place. This schedule may be subject to change if the following occur:

1. When a start date on the approved On-The-Job Training Schedule has been missed by 14 or more days;
2. When there is a change(s) in previously approved classifications;
3. When replacement trainees are added due to voluntary or involuntary termination

The revised schedule will be resubmitted to and approved by the Department's District Contract Compliance Manager. The following criteria will be used in determining whether or not the Contractor has complied with this Section as it relates to the number of trainees to be trained:

1. Full credit will be allowed for each trainee that is both enrolled and satisfactorily completes training on this Contract. Credit for trainees, over the established number for this Contract, will be carried in a "bank" for the Contractor and credit will be allowed for those surplus trainees in subsequent, applicable projects. A "banked" trainee" is described as an employee who has been trained on a project, over and above the established goal and for which the Contractor desires to preserve credit for utilization on a subsequent project.
2. Full credit will be allowed for each trainee that has been previously enrolled in the Department's approved training program on another contract and continues training in the same job classification for significant period and completes his/her training on this Contract.
3. Full credit will be allowed for each trainee who, due to the amount of work available in his/her classification, is given the greatest practical amount of training on the contract regardless of whether or not the trainee completes training.
4. Full credit will be allowed for any training position indicated in the approved On-The-Job Training Schedule, if the Contractor can demonstrate that he/she has made his/her a good faith effort to provide training in that classification.
5. No credit will be allowed for trainee whose employment by the Contractor is involuntarily terminated unless the Contractor can clearly demonstrate good cause for this action.

The Contractor shall, as far as is practical, comply with the time frames established in the approved On-The-Job Training Schedule. When this proves to be impractical, a revised schedule shall be submitted and approved as provided above.

Training and upgrading of minorities, women and economically disadvantaged persons toward journeyman status is a primary objective of this Section. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. If a non-minority male is enrolled into On-The-Job Training, the On-The-Job Training Notification of Personnel Action Form notifying the District Contract Compliance Manager of such action shall be accompanied by a disadvantaged certification or justification for such action acceptable to the Department's District Contract Compliance Manager. The Contractor will be given an opportunity and will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Section. This training is not intended and shall not be used, to discriminate against any applicant for training, whether a minority, woman or disadvantaged person.

No employee shall be employed as a trainee in any classification in which he/she has successfully completed a training course leading to journeyman status, has been employed as a journeyman, or had had extensive experience in the classification being considered for training. The Contractor shall satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be established at the Post-Preconstruction Trainee Evaluation Meeting and approved by the Department. Graduation to journeyman status will be based upon satisfactory completion of Proficiency Demonstration set up at the completion of training and established for the specific training classification, completion of the minimum hours in a training classification range, and the employer's satisfaction that the trainee does meet journeyman status in the classification of training. Upon reaching journeyman status, the following documentation must be forwarded to the District Contract Compliance Office:

Trainee Enrollment and Personnel Action form

Proficiency Demonstration Verification Form indicating completion of each standard established for the classification signed by representatives of both the contractor and the Department; and,

A letter stating that the trainee has sufficiently progressed in the craft and is being promoted to journeyman status.

The Department and the Contractor shall establish a program that is tied to the scope of the work in the project and the length of operations providing it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classifications concerned, by at least, the minimum hours prescribed for a training classification. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training or with a State Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal Aid highway construction contract. Approval or acceptance of training schedule shall be obtained from the Department prior to commencing work on the classifications covered by the program.

A voluntary On-The-Job Training Program is available to a Contractor which has been awarded a state funded project. Through this program, the Contractor will have the option to train employees on state funded projects for "banked credit" as discussed previously in this provision, to be utilized on subsequent Federal Aid Projects where training is required. Those Contractors availing themselves of this opportunity to train personnel on state funded projects and bank trainee hours for credit shall comply with all training criteria set forth in this Section for Federal Aid Projects; voluntary banking may be denied by the Department if staff is not available to monitor compliance with the training criteria.

It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial type positions. Training is permissible in positions such as office engineers, estimators, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by

the District Contract Compliance Office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not compromise a significant part of the overall training.

When approved in advance by the District Contract Compliance Manager, credit will be given for training of persons in excess of the number specified herein under the current contract or a Contractor will be allowed to bank trainees who have successfully completed a training program and may apply those trainees to a training requirement in subsequent project(s) upon approval of the Department's District Contract Compliance Manager. This credit will be given even though the contractor may receive training program funds from other sources, provided such other source do not specifically prohibit the Contractor from receiving other form of compensation. Credit for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal Aid Project; contributes to the cost of the training, provides the instruction to the trainee and pays the trainee's wages during the offsite training period.

No credit shall be given to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman for a period ample enough to allow the employee time to gain experience in the training classification or failure to continue training the employee time to gain experience in the training classifications is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Section.

The Contractor shall compensate the trainee at no less than the laborer rate established in the Contract at the onset of training. This compensation rate will be increased to the journeyman's wage for that classification upon graduation from the training program.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed. The Contractor shall enroll a trainee in one training classification at a time to completion before the trainee can be enrolled in another classification on the same project.

The Contractor shall maintain records to document the actual hours each trainee is engaged in training on work being performed as a part of this Contract.

The Contractor shall submit to the District contract Compliance Manager a copy of an On-The-Job Training Notification of Personnel Action form no later than seven days after the effective date of the action when the following occurs: a trainee is transferred on the project, transferred from the project to continue training on another contract, completes training, is upgraded to journeyman status or voluntary terminates or is involuntary terminated from the project.

The Contractor shall furnish to the District Contract Compliance Manager a copy of a Monthly Time Report for each trainee. The Monthly Time Report for each month shall be submitted no later than the tenth day of the subsequent month. The Monthly Time Report shall indicate the phases and sub-phases of the number of hours devoted to each.

Highway or Bridge Carpenter Helper, Mechanic Helper, Rodman/Chainman, Timekeeper, trainees will not be approved for the On-The-Job Training Program.

Painters, Electricians and Mechanics are identified as crafts under-utilized by minorities. All training classifications except Laborers are identified as under-utilized by females.

Priority selection should also include those crafts under-utilized and/or void of minorities and/or female by the particular company's workforce.

If the Contractor does not select a training classification that has been targeted as an under-utilized craft, and those classifications can be used for the selection of training for this project, the On-The-Job Training Schedule will not be approved unless written justification for exceptions is attached.

8. Equal Employment Opportunity

Equal Employment Opportunity Policy: Accept as the operating policy, the following statement which is designed to further the provision of equal employment opportunity to all persons without regard to their age, race, color, religion, national origin, sex, or disability and to promote the full realization of equal employment opportunity through a positive continuing program:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their age, race, religion, color, national origin, sex, or disability. Such action must include: employment upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training.

Equal Employment Opportunity Officer: Designate and make known to the Department's contracting officers an equal employment opportunity officer (hereinafter referred to as the EEO Officer) who must be capable of effectively administering and promoting an active Contractor program employment opportunity and who must be assigned adequate authority and responsibility to do so.

Dissemination of Policy: All members of the Contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the Contractor's equal employment opportunity policy and contractual responsibilities.

Recruitment: When advertising for employees, include in all advertisements for employees the notation "An Equal Opportunity Employer".

Personnel Actions: Establish and administer wages, working conditions, employee benefits, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination without regard to age, race, color, religion, national origin, sex, or disability.

Follow the following procedures:

- (1) Conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- (2) Periodically evaluate the spread of wages paid with each classification to determine any evidence of discriminatory wage practices.
- (3) Periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action must include all affected persons.
- (4) Investigate all complaints of alleged discrimination made in connection with obligations under this Contract, attempt to resolve such complaints, and take appropriate corrective action. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action must include such other persons. Upon completion of each investigation inform every complainant of all of the avenues of appeal.

Subcontracting: Use the best efforts to ensure subcontractor compliance with their equal employment opportunity policy.

Records and Reports: Keep such records as are necessary to determine compliance with the equal employment opportunity obligations. The records kept will be designed to indicate the following:

- (1) The number of minority and non-minority group members employed in each work classification on the project.
- (2) The progress and efforts being made in cooperation with unions to increase minority group employment opportunities (applicable only to Contractors who rely in whole or in part on unions as a source of their work force).
- (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority group employees as deemed appropriate to comply with their Equal Employment Opportunity Policy.
- (4) The progress and efforts being made in securing the services of minority group subcontractors or subcontractors with meaningful minority group representation among their employees as deemed appropriate to comply with their Equal Employment Opportunity Policy.

All such records must be retained for a period of three years following completion of the contract work and be available at reasonable times and places for inspection by authorized representatives to the Department and the Federal Highway Administration.

Upon request, submit to the Department a report of the number of minority and non-minority group employees currently engaged in each work classification required by the Contract work.

9. Equipment Rental Rates

For any machinery or special equipment (other than small tools, including fuel and lubricant, the Contractor will receive 100% of the "Rental Rate Blue Book" for the actual time that such equipment is in operation on the work, and 50% of the "Rental Rate Blue Book" for the time the equipment is directed to standby and remain on the project site, to be calculated as indicated below. The equipment rates will be based on the latest edition (as of the date the work to be performed begins) of the "Rental Rate Blue Book for Construction Equipment" or the "Rental Rate Blue Book for Older Construction Equipment," whichever is applicable, as published by Machinery Information Division of PRIMEDIA Information, Inc. (version current at the time of bid), using all instructions and adjustments contained therein as modified below. On all projects, the Engineer will adjust the rates using regional adjustments and Rate Adjustment Tables according to the instructions in the Blue Book.

Allowable equipment rates will be established as set out below:

- (1) Allowable Hourly Equipment Rate = $\text{Monthly Rate} / 176 \times \text{Adjustment Factors} \times 100\%$.
- (2) Allowable Hourly Operating Cost = $\text{Hourly Operating Cost} \times 100\%$.
- (3) Allowable Rate Per Hour = Allowable Hourly Equipment Rate + Allowable Hourly Operating Cost.
- (4) Standby Rate = $\text{Allowable Hourly Equipment Rate} \times 50\%$.

The Monthly Rate is The Basic Machine Rate Plus Any Attachments. Standby rates will apply when equipment is not in operation and is directed by the Engineer to standby at the project sit when needed again to complete work and the cost of moving the equipment will exceed the accumulated standby cost. Standby rates will not apply on any day the equipment operates for eight or more hours. Standby payment will be limited to only that number of hours which, when added to the operating time for that day equals eight hours. Standby payment will not be made on days that are not normally considered work days on the project.

The Owner will allow for the cost of transporting the equipment to and from the location at which it will be used. If the equipment requires assembly or disassembly for transport, the Owner will pay for the time to perform this work at the rate for standby equipment. Equipment may include vehicles utilized only by Labor, as defined above.

10. Foreign Contractor and Supplier Restriction

This item is combined with item #4 above

11. Incentive/Disincentive Clauses

Not applicable to this contract.

12. Indian Preference On Federal-Aid Projects (Labor & Employment)

Not applicable to this contract.

13. REQUIREMENTS FOR FEDERAL JOBS – COMPLIANCE WITH FHWA 1273

The FHWA-1273 Electronic version, dated March 1994 is posted on the Department of Transportation's website at the following URL address: www.dot.state.fl.us/specificationsoffice/Implemented/URSinSpecs/files/df1273.pdf.

Take responsibility to obtain this information and comply with all requirements posted on this website through five (5) calendar days before the opening of bids. Comply with the provisions contained in FHWA-1273 and certify monthly compliance with the EEO provisions of FHWA-1273 (Section II. Nondiscrimination and Section III. Non-segregated Facilities). In addition to the requirements of FHWA-1273, Section V, No. 2 (b), include GENDER and RACE in the weekly annotated payroll records. Federal Regulations (29 CFR 3.5) states that Social Security numbers and address of employees shall not be included on submitted payrolls for contracts let after January 18, 2009. In lieu of a Social Security number, an employee identifying number must be listed. The employer may use the last four (4) digits of the Social Security number or another assigned number as the employee identifying number.

Item 14
(Form FHWA-1273 (Rev.3-94))
(9 Total Pages)

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

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ATTACHMENTS

A. Employment Preference for Appalachian Contracts
(Included in Appalachian contracts only)

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all

related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed

in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for

minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA

each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than the plan permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour

Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made

either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of

a subcontractor, assignee, or agent of the prime contractor.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality,

quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 *et seq.*, as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 *et seq.*, as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this

transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

.....

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and

frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT PREFERENCE FOR
APPALACHIAN CONTRACTS**
(Applicable to Appalachian contracts only.)

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph 1c shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph 4 below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification,

(c) the date on which he estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, he shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within 1 week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph 1c above.

5. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

15. Liquidated Damages

Applicable liquidated damages are the amounts established in the following schedule:

Contract Amount	Daily Charge Per Calendar Day
\$50,000 and under	\$278
Over \$50,000 but less than \$250,000	\$388
\$250,000 but less than \$500,000	\$566
\$500,000 but less than \$2,500,000	\$1148
\$2,500,000 but less than \$5,000,000	\$1914
\$5,000,000 but less than \$10,000,000	\$2514
\$10,000,000 but less than \$15,000,000	\$3300
\$15,000,000 but less than \$20,000,000	\$3782
\$20,000,000 and over	\$5684 plus 0.00005 of any amount over \$20 million

For all contracts, regardless of whether the contract time is stipulated in calendar days or working days, the Engineer will count default days in calendar days. If the Contractor or, in case of his default, the surety fails to complete the work within the time stipulated in the Contract, or within such extra time that the Owner may have granted the Contractor or, in case of his default, the surety shall pay to the Owner, not as a penalty, but as liquidated damages, in the amount of \$566.00 per calendar day in which work is not completed.

The Owner has the right to apply, as payment on such liquidated damages, any money the Owner owes the Contractor.

The Owner does not waive its right to liquidated damages due under the Contract by allowing the Contractor to continue and finish the work, or any part of it, after the expiration of the Contract Time including granted time extensions.

In the case of default of the Contract and the completion of the work by the Owner, the Contractor and his surety are liable for the liquidated damages under the Contract, but the Owner will not charge liquidated damages for any delay in the final completion of the Owner's performance of the work due to any unreasonable action or delay on the part of the Owner.

The Owner considers the Contract complete when the Contractor has completed all work and the Owner has accepted the work. The Owner will then release the Contractor from further obligation except as set forth in his bond.

16. State/Local Hiring Preference

The Owner certifies that this contract does not include state or local hiring preferences.

17. Method of Bidding

The OWNER certifies that this project shall be awarded to the lowest responsive and responsible bidder.

18. Owner Force Account/Cost Effective Justification

Not applicable to this contract. Manatee County will be utilizing an independent contractor to perform the scope of work

19. Patented/Proprietary Materials

The Owner certifies that neither patented or proprietary materials are required or specifically named in the specifications to be used for this project.

20. Prevailing Minimum Wage

For this contract, payment of predetermined minimum wages applies. The U.S. Department of Labor Wage Rates applicable to this Contract are listed in Wage Rate Decision Number(s) **FL FL100322 03/12/2010 FL322 Highway, for Manatee County,** as modified up through ten days prior to the opening of bids.

Obtain the applicable General Decision(s) (Wage Tables) through the Department's Office of Construction website and ensure that employees receive the minimum compensation applicable. Review the General Decisions for all classifications necessary to complete the project. Request additional classifications through the Engineer's office when needed.

State: Florida

Construction Type: Highway

Counties: Brevard, Collier, Hernando, Hillsborough, Lee, **Manatee**, Martin, Orange, Osceola, Pasco, Pinellas, Polk, Sarasota, Seminole and St Lucie Counties in Florida.

EXCLUDING CAPE CANAVERAL AIR FORCE STATION, PATRICK AIR FORCE BASE, KENNEDY SPACE FLIGHT CENTER AND MELABAR RADAR SITE
HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects, & railroad construction; bascule, suspension & spandrel arch bridges; bridges designed for commercial navigation; bridges involving marine construction; & other major bridges.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE LABOR WAGE RATES APPLICABLE TO THIS CONTRACT TEN DAYS PRIOR TO THE OPENING BID DATE.

General Decision Number: FL100322 03/12/2010 FL322

Superseded General Decision Number: FL20080322

State: Florida

Construction Type: Highway

County: Manatee County in Florida.

HIGHWAY CONSTRUCTION PROJECTS

Modification Number Publication Date
0 03/12/2010

* ELEC0915-004 12/01/2009

	Rates	Fringes
ELECTRICIAN.....	\$ 24.16	34%+\$0.22

* SUFL2009-219 08/05/2009

	Rates	Fringes
CARPENTER.....	\$ 15.30	2.54
CEMENT MASON/CONCRETE FINISHER...	\$ 12.30	0.00
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine).....	\$ 11.97	2.23
HIGHWAY/PARKING LOT STRIPING: Painter.....	\$ 13.31	0.00
IRONWORKER, REINFORCING.....	\$ 14.50	1.37
IRONWORKER, STRUCTURAL.....	\$ 16.75	3.88
LABORER: Asphalt Shoveler.....	\$ 10.70	0.00
LABORER: Common or General.....	\$ 9.00	0.00
LABORER: Flagger.....	\$ 12.75	0.00
LABORER: Grade Checker.....	\$ 10.50	0.55
LABORER: Landscape and Irrigation.....	\$ 8.77	0.00
LABORER: Luteman.....	\$ 10.32	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 12.00	1.80

LABORER: Pipelayer.....	\$ 11.63	2.65
LABORER: Power Tool Operator (Hand Held Drills/Saws, Jackhammer and Power Saws.....	\$ 11.23	1.96
OPERATOR: Asphalt Paver.....	\$ 11.52	0.00
OPERATOR: Asphalt Plant.....	\$ 12.20	0.00
OPERATOR: Asphalt Spreader.....	\$ 10.76	0.00
OPERATOR: Auger.....	\$ 19.40	0.44
OPERATOR: Backhoe Loader Combo.....	\$ 15.33	0.97
OPERATOR: Backhoe.....	\$ 15.50	2.28
OPERATOR: Boom.....	\$ 16.61	0.00
OPERATOR: Bulldozer.....	\$ 13.71	1.55
OPERATOR: Crane.....	\$ 19.94	1.37
OPERATOR: Distributor.....	\$ 11.47	0.00
OPERATOR: Drill.....	\$ 13.00	1.59
OPERATOR: Grader/Blade.....	\$ 14.32	0.00
OPERATOR: Loader.....	\$ 12.83	1.29
OPERATOR: Mechanic.....	\$ 16.31	1.37
OPERATOR: Milling Machine.....	\$ 11.92	0.00
OPERATOR: Oiler.....	\$ 11.92	1.91
OPERATOR: Paver.....	\$ 12.42	0.86
OPERATOR: Piledriver.....	\$ 15.59	4.00
OPERATOR: Roller.....	\$ 11.33	0.00
OPERATOR: Scraper.....	\$ 10.70	1.60
OPERATOR: Screed.....	\$ 10.82	0.00
OPERATOR: Tractor.....	\$ 12.78	0.00
OPERATOR: Trencher.....	\$ 13.41	0.49
PAINTER: Spray and Steel.....	\$ 16.62	0.00
TRUCK DRIVER: Distributor.....	\$ 11.30	2.26

TRUCK DRIVER: Dump Truck.....	\$ 10.05	0.00
TRUCK DRIVER: Lowboy Truck.....	\$ 14.05	0.00
TRUCK DRIVER: Material Truck....	\$ 12.76	9.80
TRUCK DRIVER: Tractor Haul Truck.....	\$ 10.64	0.00
TRUCK DRIVER: Water Truck.....	\$ 10.50	0.00
TRUCK DRIVER: 10 Yard Haul Away.....	\$ 12.50	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this

Revised 8/4/2011 (updated E-Verification)
Revised 11/2/2011 (added DBE Goal of 8.60%)

initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

21. Progress Payments/Estimates

Partial Payments

General: The Engineer will make partial payments on monthly estimates based on the amount of work that the Contractor completes during the month (including deliver of certain materials, as specified herein below). The Engineer will make approximate monthly payments, and the Owner will correct all partial estimates and payments in the subsequent estimates and in the final estimate and payment.

The Owner will base the amount of such payments on the total value of the work that the Contractor has performed to the date of the estimate, based on the quantities completed and the Contract prices, less payments previously made and less any retainage withheld.

Retainage will not be withheld until the percent of allowable Contract time used exceeds 75%. From that time forward, the Owner will withhold retainage of 10% of the amount due on the current estimate as retainage when the percent of allowable Contract time used exceeds the percent of Contract amount earned by more than 15%.

Contract amount is defined as the original Contract amount adjusted by approved supplemental agreements. Contract time is defined as the original Contract time adjusted by approved Contract time extensions.

Retainage will be determined for each job on multiple job Contracts. The Owner will not accept Securities, Certificates of Deposit or letters of credit as a replacement for retainage. Amounts withheld will not be released until payment of the final estimate.

Unsatisfactory Payment Record: In accordance with Sections 255.05 and 337.16 of the Florida Statutes, and the rules of the Owner, the Owner may disqualify the Contractor from bidding on future Owner contracts if the Contractor's payment record in connection with contract work becomes unsatisfactory. The Owner may also disqualify the surety from issuing bonds for future Owner contracts if they similarly fail to perform under the terms of their bond.

Withholding Payment for Defective Work: If the Owner discovers any defective work or material prior to the final acceptance, or if the Owner has a reasonable doubt as to the integrity of any part of the completed work prior to final acceptance, then the Owner will not allow payment for such defective or questioned work until the Contractor has remedied the defect and removed any causes of doubt.

Withholding Payment for Failure to Comply: The Owner will withhold progress payments from the Contractor if he fails to comply with any or all of the following within 60 days after beginning work;

- (a) Comply with and submit required paperwork relating to prevailing wage rate provisions, Equal Employment Opportunity, On-The-Job Training and Affirmative Action;
- (b) Comply with the requirement to all necessary information, including actual payments to DBEs, all other subcontractors and major suppliers, through the Internet based Equal Opportunity Report System;
- (c) Comply with or make a good faith effort to ensure employment opportunity for minorities and females in accordance with the required contract provisions for Federal Aid Construction Contracts, and
- (d) Comply with or make a good faith effort to meet On-The-Job Training goals.

The Owner will withhold progress payments until the Contract has satisfied the above conditions.

Release of Retainage After Acceptance: When the Contractor has furnished the Owner with all submittals required by the Contract, such as invoices, EEO reports, materials certifications, certification of materials procured, etc., (excluding Contractor's letter of acceptance of final amount due) and the Engineer has determined that the measurement and computation of pay quantities is correct, the Owner may reduce the retainage to \$1,000 plus any amount that the Owner elects to deduct for defective work.

The Owner will not allow a semifinal estimate under the provisions of the above paragraphs unless the time elapsing between (1) acceptance of the project and receipt of all test reports, invoices, etc., and (2) submission of the final estimate to the Contractor for acceptance, exceeds or is expected to exceed ten days.

The Owner may deduct from payment estimates any sums that the Contractor owes to the Owner on any account. Where more than one project or job (separate job number) is included in the Contract, the Owner will distribute the reduced retainage as provided in the first paragraph of this Subarticle to each separate project or job in the ratio that the Contract value of the work for the particular job bears to the total Contract amount.

Partial Payments for Delivery of Certain Materials:

General: The Owner will allow partial payments for new materials that will be permanently incorporated into the project and are stockpiled in approved locations in the project vicinity. Stockpile materials so that they will not be damaged by the elements and in a manner that identifies the project on which they are to be used.

The following conditions apply to all payments for stockpiled materials:

- (1) There must be reasonable assurance that the stockpiled material will be incorporated into the specific project on which partial payment is made.
- (2) The stockpiled material must be approved as meeting applicable specifications.
- (3) The total quantity for which partial payment is made shall not exceed the estimated total quantity required to complete the project.
- (4) The Contractor shall furnish the Engineer with copies of certified invoices to document the value of the materials received. The amount of the partial payment will be determined from invoices for the material up to the unit price in the Contract.
- (5) Delivery charges for materials delivered to the jobsite will be included in partial payments if properly documented.
- (6) Partial payments will not be made for materials which were stockpiled prior to award of the Contract for a project.

Partial Payment Amounts: The following partial payment restrictions apply:

- (1) Partial payments less than \$5,000 for any one month will not be processed.
- (2) Partial payments for structural steel and precast pre-stressed items will not exceed 85% of the bid price for the item. Partial payments for all other items will not exceed 75% of the bid prices of the item in which the material is to be used.
- (3) Partial payment will not be made for aggregate and base course material received after paving or base construction operations begin except when a construction sequence designated by the Owner requires suspension of paving and base construction after the initial paving operations, partial payments will be reinstated until the paving and base construction resumes.

Off Site Storage: If the conditions of the General section above are satisfied, partial payments will be allowed for materials stockpiled in approved in-state locations. Additionally, partial payments for materials stockpiled in approved out-of-state locations will be allowed if the conditions above and the following conditions are met:

- (1) Furnish the Owner a Materials Bond stating the supplier guarantees to furnish the material described in the Contract to the Contractor and Owner. Under this bond, the Obligor shall be the material supplier and the Obligees shall be the Contractor and the Owner. The bond shall be in the full dollar amount of the bid price for the materials described in the contract.
- (2) The following clauses must be added to the constructions contract between the Contractor and the supplier of the stockpiled materials:
“Notwithstanding anything to the contrary, <supplier> will be liable to the Contractor and the Owner should <supplier> default in the performance of this agreement.”

“Notwithstanding anything to the contrary, this agreement, and the performance bond issued pursuant to this agreement, does not alter, modify, or otherwise change the contractor’s obligation to furnish the materials described in this agreement to the Owner.”

- (3) The agreement between the Contractor and the supplier of the stockpiled materials must include provisions that the supplier will store the materials and that such materials are the property of the Contract.

Certification of Payment to Subcontractors: The term “subcontractor,” as used herein, includes persons or firms furnishing materials or equipment incorporated into the work or stockpiled for which the Owner has made partial payment and firms working under equipment-rental agreements. The contractor is required to pay all subcontractors for satisfactory performance of their Contracts before the Owner will make a further progress (partial) payment. The Contractor shall also return all retainage withheld to the subcontractors within 30 days after the subcontractor’s work is satisfactorily complete, as determined by the Owner. Prior to receipt of any progress (partial) payment, the prime contractor shall certify that all Subcontractors having an interest in the Contract were paid for satisfactory performance of their Contracts and that the retainage is returned to subcontractors within 30 days after satisfactory completion of the subcontractor’s work. Provide this certification in the form designated by the Owner.

Within 30 days of the Contractor’s receipt of the final progress payment or any other payments thereafter, except the final payment, the Contractor shall pay all subcontractors and suppliers having an interest in the Contract for all work completed and materials furnished. The Owner will honor an exception to the above when the written notification of any such good cause to both the Owner and the affected subcontractors or suppliers within said 30 day period.

Acceptance and Final Payment Documents: Whenever the Contractor has completely performed the work provided for under the Contract and the Engineer has performed a final inspection and made final acceptance the Engineer will prepare a final estimate showing the value of the work as soon as the Engineer makes the necessary measurements and computations. The Engineer will correct all prior estimates and payments in the final estimate and payment. The Owner will pay the estimate, less any sums that the Owner may have deducted or retained under the provisions of the Contract, as soon as practicable after final acceptance of the work, along with all executed supplemental agreements received after final acceptance.

22. Prohibition Against Convict Produced Materials

Source of Supply — Convict Labor (Federal-Aid Contracts Only): Do not use materials that were produced after July 1, 1991, by convict labor for Federal-aid highway construction projects unless the prison facility has been producing convict-made materials for Federal-aid highway construction projects before July 1, 1987.

Use materials that were produced prior to July 2, 1991, by convicts on Federal-aid highway construction projects free from the restrictions placed on the use of these

materials by 23 U.S.C. 114. The Department will limit the use of materials produced by convict labor for use in Federal-aid highway construction projects to:

1. materials produced by convicts on parole, supervised release, or probation from a prison or,

2. materials produced in a qualified prison facility.

The amount of such materials produced for Federal-aid highway construction during any 12-month period shall not exceed the amount produced in such facility for use in such construction during the 12-month period ending July 1, 1987.

23. Public Agencies in Competition With the Private Sector

The OWNER does not allow other Public Agencies to compete with or bid on construction projects against the private sector.

24. Publicly-Owned Equipment

The OWNER does not allow Contractors the use of publicly owned equipment.

25. Salvage Credits

The OWNER does not allow the contractor to get credits for salvageable materials.

26. Standardized Changes Conditions Contract Clauses

Differing site conditions. (i) During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the site is disturbed and before the affected work is performed.

(ii) Upon written notification, the engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding anticipated profits, will be made and the contract modified in writing accordingly. The engineer will notify the contractor of the determination whether or not an adjustment of the contract is warranted.

(iii) No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has provided the required written notice.

(iv) No contract adjustment will be allowed under this clause for any effects caused on unchanged work.

Suspensions of work ordered by the engineer. (i) If the performance of all or any portion of the work is suspended or delayed by the engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, the contractor shall submit

to the engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

(ii) Upon receipt, the engineer will evaluate the contractor's request. If the engineer agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. The contractor will be notified of the engineer's determination whether or not an adjustment of the contract is warranted.

(iii) No contract adjustment will be allowed unless the contractor has submitted the request for adjustment within the time prescribed.

(iv) No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided or excluded under any other term or condition of this contract.

Significant changes in the character of work. (i) The engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the contractor agrees to perform the work as altered.

(ii) If the alterations or changes in quantities significantly change the character of the work under the contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profit, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the contractor in such amount as the engineer may determine to be fair and equitable.

(iii) If the alterations or changes in quantities do not significantly change the character of the work to be performed under the contract, the altered work will be paid for as provided elsewhere in the contract.

(iv) The term "significant change" shall be construed to apply only to the following circumstances:

(A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or

(B) When a major item of work, as defined elsewhere in the contract, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed.

27. State Produced Materials (Florida or other)

The OWNER certifies that preference is not given to contractors who purchases materials from and specifically designated state.

28. State/Local Owned/Furnished/Designated Materials

All materials required for this project shall be furnished by the contractor. Projects located on the National Highway System shall require FHWA approval for direct purchase of materials by the Owner.

29. Subcontracting

Do not sell, transfer, assign or otherwise dispose of the Contract or Contracts or any portion thereof, or of the right, title, or interest therein, without written consent of the Owner. If the Contractor chooses to sublet any portion of the Contract, the Contractor must provide a written request to sublet work on the Certification of Sublet Work form developed by the Owner for this purpose. With the Engineer's acceptance of the request, the contractor may sublet a portion of the work, but shall perform with his own organization work amounting to not less than 30% of the total Contract amount. The Certification of Sublet Work request will be deemed acceptable by the Owner, for purposes of the Owner's consent, unless the engineer notifies the Contractor within 5 business days of receipt of the Certification of Sublet Work that the Owner is not consenting to the requested subletting.

Include in the total Contract amount the cost of materials and manufactured component products, and their transportation to the project site. For the purpose of meeting this requirement the Owner will not consider off-site commercial production of materials and manufactured component products that the Contractor purchases, or their transportation to the project, as subcontracted work.

If the contractor sublets a part of a Contract item, the Owner will use only the sublet proportional cost in determining the percentage of subcontracted normal work.

Execute all agreements to sublet work in writing and include all pertinent provisions and requirements of the Contract. Upon request, furnish the Owner with a copy of the subcontract. The subletting of work does not relieve the Owner or the surety of their respective liabilities under the Contract.

The Owner recognizes a subcontractor only in the capacity of an employee or agent of the Contractor and Engineer may require the Contractor to remove the subcontractor as in the case of an employee.

30. Termination of Contract

Owner may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety (90) days by written notice to the Contractor, which will fix the date on which work will be resumed. Contractor shall be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to any suspension if Contractor makes an approved claim thereof.

Owner may terminate the contract if Contractor commences a voluntary case under any chapter of the Bankruptcy Code or any similar action by filing a petition under any other federal or state law relating to the bankruptcy or insolvency; if a petition is filed against the Contractor under any chapter of the Bankruptcy Code or similar relief under any other federal or state law; if Contractor persistently fails to perform the work in accordance with the contract documents; if Contractor disregards laws or regulations of any public body having jurisdiction or the Engineer; or otherwise violates in any substantial way any provisions of the contract.

Owner may, after giving Contractor (and the surety, if there is one) seven (7) days written notice and to the extent permitted by laws and regulations, terminate the services of Contractor; exclude Contractor from the site and take possession of the work and of all Contractor's tools, construction equipment and machinery at the site and use the same to the full extent they could be used (without liability to Contractor for trespass or conversion); incorporate in the work all materials and equipment stored at the site or for which Owner has paid Contractor but which are stored elsewhere, and finish the work as Owner may deem expedient. In such case, Contractor shall not be entitled to receive any further payment beyond an amount equal to the value of material and equipment not incorporated in the work, but delivered and suitably stored, less the aggregate of payments previously made. If the direct and indirect costs of completion exceed the unpaid balance of the contract price, Contractor shall pay the difference to Owner.

Such costs incurred by Owner shall be verified by Owner and incorporated in a change order; but in finishing the work, Owner shall not be required to obtain the lowest figure for the work performed. Contractor's obligations to pay the difference between such costs and such unpaid balance shall survive termination of the Agreement.

If, through no act or fault of Contractor, the work is suspended for a period of more than ninety (90) days by Owner or under an order of court or other public authority, or Engineer fails to act on any application or fails to pay Contractor any sum finally determined to be due; then Contractor may, upon seven days written notice to Owner terminate the Agreement and recover from Owner payment for all work executed, any expense sustained plus reasonable termination expenses. In lieu of terminating the Agreement, if Engineer has failed to act on any application of payment or Owner has failed to make any payment as aforesaid, Contractor may upon seven (7) days written notice to Owner stop the work until payment of all amounts then due.

31. Time Extensions

Contract time may only be changed by a change order or a written amendment. Any claim for an extension or shortening of the contract time shall be based on written notice delivered by the party making the claim to the other party. Notice of the extent of the claim with supporting data shall be delivered within fifteen (15) days from detection or beginning of such occurrence and shall be accompanied by the claimant's written

statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event.

The contract time will be extended in an amount equal to time lost due to delays beyond the control of Contractor. Such delays shall include, but not be limited to, acts or neglect by Owner or others performing additional work; or to fires, floods, epidemics, abnormal weather conditions or acts of God.

All time limits stated in the contract documents are of the essence. The provision of this Article shall not exclude recovery for damages (including, but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) for delay by either party.

32. E- VERIFY

Vendor/Contractor:

1. Shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Vendor / Contractor during the term of the contract; and
2. Shall expressly require any subcontractors performing work or providing services pursuant to the state contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the contract term.

33. Title VI – Of the Civil Right Act of 1964 and Related Statutes

The sub-recipient or Contractor, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 200d to 200d-7 and title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises as defined at 49 CFR Part 26 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, sex, age, disability in consideration for an award.

While performing this contract, the contractor – for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) – agrees to the following:

1. **Compliance with Regulations:** The contractor will comply with the Regulations on nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation (“USDOT”) Title 49, Code of Federal Regulations, Part 21. The recommendations may be amended from time to time, (from here on referred to as the Regulations). They are incorporated hereby reference and made a part of this contract.

2. Nondiscrimination: In work performed during the contract, the Contractor will not discriminate on the grounds of race, color, or national origin in the selection and holding of subcontractors. This includes obtaining materials and leases of equipment. The contractor will not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations. This includes employment practices when the contract covers a program set forth in Appendix B of the Regulations.

3. Solicitations for Subcontractors, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, the contractor will inform each potential subcontractor or supplier of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin. The solicitations including obtaining materials or leases of equipment.

4. Information and Reports: The contractor will provide all information and reports required by the Regulations or directives. It will also permit access to its books, records, accounts, other source of information, and its facilities that are determined by the (Recipient) or the (Name of Appropriate Administration) to be important to ensure compliance with such Regulations, orders and instructions. In some cases, another entity possesses the information required of a contractor and refuses to give the information.

Here, the contractor will confirm the lack of information with the (Recipient), or the Name of the Administration) as appropriate, and will explain its efforts to obtain the information.

5. Sanctions for Noncompliance: In the event that the contractor does not comply with the nondiscrimination provisions of this contract, the (Recipient) should enforce contract sanctions as it or the (Name of Appropriate Administration) may determine to be appropriate. Sanctions may include, but not limit to:

a. Withholding of payment to the contractor under the contract until the contractor complies, and/or

b. Cancellation, termination or suspension of the contract, in whole or in part.

6. Incorporation of Provision: The contractor should include the terms of paragraphs (1) through (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued modifying the Provisions. The contractor will take action with on any subcontract or procurement that the (Recipient) or the (Name of appropriate administration) directs in order to enforce provisions including sanctions for non-compliance. However, if a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier because of such direction, the contractor may ask the (Recipient) to enter into such litigation to protect the interests of the (Recipient). Also, the contractor may ask

the United States to enter into such litigation to protect the interests of the United States.

THE CONTRACTOR CERTIFIES THE FOLLOWING STATEMENTS:

34. Non-Collusion Provision

The undersigned hereby certifies, to the best of his or her knowledge and belief, that on behalf of the person, firm, association, or corporation submitting the bid certifying that such person, firm association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action, in restraint of free competitive bidding in connection with the submitted bid. Failure to submit the executed statement as part of the bidding documents will make the bid nonresponsive and not eligible for award consideration.

35. Lobbying Certification

"The undersigned hereby certifies, to the best of her knowledge and belief, that:

(a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence either directly or indirectly an officer or employee of any state or federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal Contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant loan, or cooperative agreement, the undersigned shall complete and submit Standard Form –L "Disclosure Form to Report Lobbying", in accordance with its instructions.

(c) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is prerequisite for making or entering into this transaction imposed by section 1352, title 31, US Code. Any persons who fail to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each failure."

36. Suspension and Debarment

"The Bidder certifies that, neither the firm nor any person associated therewith in the capacity of owner, partner, director, officer, principal, investigator, project director, manager, auditor, and/or position involving the administration of federal funds:

(a) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transaction, as defined in 49 CFR s29.110(a), by any federal department or agency;

(b) has within a three-year period preceding this certification been convicted of or had a civil judgment rendered against it for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state, or local government transaction or public contract; violation of federal or state antitrust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) is presently indicted for or otherwise criminally or civilly charged by a federal, state, or local governmental entity with commission of any of the offenses enumerated in paragraph 9(b) of this certification; and

(d) has within a three-year period preceding this certification had one or more federal, state, or local government public transactions terminated for cause or default.

The Bidder certifies that it shall not knowingly enter into any transaction with any subcontractor, material supplier or vendor who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this project by any federal agency unless authorized by the Florida Department of Transportation."

THE CONTRACTOR CERTIFIES THE ABOVE STATEMENTS:

Signature

Printed Name

Firm Name

ATTACHMENT “A”



FLORIDA DEPARTMENT OF TRANSPORTATION

Equal Opportunity Office
605 Suwannee Street, MS-65
Tallahassee, Florida 32399-0450

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM PLAN FOR LOCAL AGENCIES

Purpose

The Florida Department of Transportation (Department) has been charged with reporting DBE information to the U.S. Department of Transportation Federal Highway Administration (FHWA) according to 49 Code of Federal Regulations (CFR) Part 26.

Objective

To assist Local Agencies (Cities, Counties and Metropolitan Planning Organizations) receiving Federal funds from the Department to comply with the Federal DBE Program requirements.

DBE Utilization

The Department began its race neutral DBE program on January 1, 2000. Contract specific goals are not placed on State/Federal contracts; however, the Department has an overall 8.18% goal it must achieve. Participating Local Agencies must adopt the Department's DBE Program goal. Further information about the Department's DBE Program goal can be found at.

Local Agencies should monitor potential or anticipated DBE utilization for contracts. When the low bidder executes the contract, information will be requested of the contractor's anticipated DBE participation for the project. While the utilization is not mandatory in order to be awarded the project, continuing utilization of DBE firms on contracts supports the success of Florida's Voluntary DBE Program, and supports contractors' Equal Employment Opportunity and DBE Affirmative Action Programs.

NOTE: Any project listed as 0% DBE availability does not mean that a DBE may not be used on that project. A 0% DBE availability may have been established due to any of the following reasons: limited identified subcontracting opportunities, minimal contract days, and/or small contract dollar amount. Contractors are encouraged to identify any opportunities to subcontract to DBEs.

Required Information

Each Local Agency is required to provide the following information to the District Local Agency Program (LAP) Administrator for verification. The District LAP Administrator will forward the information to the Equal Opportunity Office.

1. Anticipated DBE Participation Statement (Form No. 275-030-12)

The "Anticipated DBE Participation Statement" shall be completed and submitted by the Contractor at the pre-construction conference or by the Consultant during the negotiation process. The Statement must only include companies certified as a DBE. The Statement can and should be updated when additions or deletions are made through the life of the contract. This will not become a mandatory part of the contract. It will assist the Department in tracking planned or estimated DBE participation. The Local Agency must send the Statement to the District LAP Administrator or designee who will forward the information to the Department's Equal Opportunity Office at the following address:

Florida Department of Transportation
Equal Opportunity Office
605 Suwannee Street. MS-65
Tallahassee, Florida 32399-0450
Fax Number: (850) 414-4879

2. Bid Opportunity List (Form No. 275-030-10)

Federal regulations require States to maintain a database of all firms that are participating or attempting to participate in Department -assisted contracts. The list must include all firms that bid on prime contracts or bid or quote subcontracts on Department-assisted projects, including both DBEs and non-DBEs. The "Bid Opportunity List" is used to record the bidder information for all Subcontractors or Subconsultants who submitted bids to Primes. This information should be returned with the bid or proposal package. The Local Agency must send the form to the District LAP Administrator who will forward to the Equal Opportunity Office at:

Florida Department of Transportation
Equal Opportunity Office
605 Suwannee Street. MS-65
Tallahassee, Florida 32399-0450
Fax Number: (850) 414-4879

3. Instructions for Reporting Actual Payments

To comply with 49 Code of Federal Regulations (CFR) Part 26, the Department is also required to collect actual payments made to Subcontractors and Subconsultants in addition to the planned DBE participation. The Local Agency is required to report data on actual payments, minority status, and the type of work of all Subcontractors, Subconsultants, and major Suppliers. Each month the Local Agency must report actual payments to all DBE Subcontractors, Subconsultants, and Suppliers. Payments to all non-DBE Subcontractors and Subconsultants can be reported either monthly or at the end of the project. Local Agency may submit this information to the District LAP Administrator or designee manually or electronically in an Excel spreadsheet. This information will be forwarded to Carol Greene, DBE Program Analyst at Carol.Greene@dot.state.fl.us.

ATTACHMENTS

1. Required DBE Language for Contracts
2. Anticipated DBE Participation Statement (**Form No. 275-030-12**)
3. Instructions for Reporting Actual Payments
4. Bid Opportunity List (**Form No. 275-030-10**)

DBE LANGUAGE for CONSTRUCTION CONTRACTS

Contract Assurance: *The Contractor, Subrecipient or Subcontractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of Department-assisted contracts. Failure of the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Recipient deems appropriate.*

DBE LANGUAGE for CONSULTANT CONTRACTS

Contract Assurance: *The Consultant, Subrecipient, or subconsultant shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The Consultant shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of Department- assisted contracts. Failure of the Consultant to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Recipient deems appropriate.*

**LOCAL AGENCY PROGRAM
ANTICIPATED DBE PARTICIPATION
STATEMENT**

275-030-12
EQUAL OPPORTUNITY OFFICE
03/09

1. FDOT LAP AGREEMENT#	2. FDOT LAP AGREEMENT AMOUNT	3. LOCAL AGENCY CONTRACT (PRIME)#.	4. LOCAL AGENCY'S NAME
5. PRIME CONTRACTOR'S NAME			6. FEID NUMBER - PRIME CONTRACTOR)
7. CONTRACT DOLLAR AMOUNT			8. FEID NUMBER - (LOCAL AGENCY)
9. IS THE PRIME CONTRACTOR A FLORIDA-CERTIFIED DISADVANTAGED BUSINESS ENTERPRISE (DBE)?		YES <input type="checkbox"/> NO <input type="checkbox"/>	10. IS THE WORK OF THIS CONTRACT CONSTRUCTION <input type="checkbox"/> OR MAINTENANCE <input type="checkbox"/> OTHER? _____
11. REVISION (Y/N)? _____ IF YES, REVISION NUMBER _____			

12. ANTICIPATED DBE SUBCONTRACTORS (BELOW):

	DBE SUBCONTRACTOR OR SUPPLIER	TYPE OF WORK/SPECIALTY	DOLLAR AMOUNT	PERCENT OF CONTRACT DOLLARS
A				
B				
C				
D				
E				
F			11A TOTAL DOLLARS TO DBE'S \$0.00	11B TOTAL PERCENT OF CONTRACT 0.00%

SECTION TO BE COMPLETED BY PRIME CONTRACTOR

13. NAME OF SUBMITTER	14. DATE	15. TITLE OF SUBMITTER
16. EMAIL ADDRESS OF PRIME CONTRACTOR/ SUBMITTER		17. FAX NUMBER
		18. PHONE NUMBER

SECTION TO BE COMPLETED BY LOCAL AGENCY

19. SUBMITTED BY	20. DATE	21. TITLE OF SUBMITTER
22. EMAIL ADDRESS OF SUBMITTER		23. FAX NUMBER
		24. PHONE NUMBER

NOTE: THIS INFORMATION IS USED TO TRACK AND REPORT ANTICIPATED DBE PARTICIPATION IN ALL FEDERALLY- FUNDED FDOT CONTRACTS. THE ANTICIPATED DBE AMOUNT IS VOLUNTARY AND WILL NOT BECOME A PART OF THE CONTRACTUAL TERMS. THIS FORM MUST BE SUBMITTED AT THE PRE- CONSTRUCTION. FDOT STAFF FORWARDS THE FORM TO THE EQUAL OPPORTUNITY OFFICE.

THE FOLLOWING SECTIONS ARE FOR FDOT LAP USE

DISTRICT	LAP NAME	DATE TO EOO OFFICE (ELECTRONICALLY)	EXECUTED DATE (LAP AGREEMENT)	EXECUTED DATE (BETWEEN LOCAL AGENCY AND PRIME)	PRE-CONSTRUCTION CONFERENCE DATE.

INSTRUCTIONS FOR REPORTING ACTUAL PAYMENTS

To comply with 49 Code of Federal Regulations (CFR) Part 26, the Department is also required to collect actual payments made to Subcontractors and Subconsultants in addition to the planned DBE participation. The Local Agency is required to report data on actual payments, minority status, and the type of work of all Subcontractors, Subconsultants, and major Suppliers. Each month the Local Agency must report actual payments to all DBE Subcontractors, Subconsultants, and Suppliers. Payments to all non-DBE Subcontractors and Subconsultants can be reported either monthly or at the end of the project. Local Agency may submit this information to the District LAP Administrator or designee manually or electronically in an Excel spreadsheet. This information will be forwarded to Joseph Salib, DBE Program Analyst at Joseph.Salib@dot.state.fl.us.

NOTE: It is extremely important that the Contractor submits the "Anticipated DBE Participation Statement" at the preconstruction conference for all Federally- funded projects to the Local Agency. This primary information is used by the Federal Government to evaluate the Department's performance in the DBE Program.

**FLORIDA DEPARTMENT OF TRANSPORTATION
BID OPPORTUNITY LIST**

FORM #275-030-10

Please complete and mail or fax to:

Equal Opportunity Office
605 Suwannee St., MS 65
Tallahassee, FL 32399-0450
TELEPHONE: (850) 414-4747
FAX: (850) 414-4879

This information may also be included in your bid or proposal package.

Prime Contractor/Consultant: _____

Address/Telephone Number: _____

Bid/Proposal Number: _____

Quote Submitted MM/YR: _____

49 CFR Part 26.11 _____

The following is intended to be a listing of all firms that are participating, or attempting to participate, on Department-assisted contracts. The list must include all firms that bid on prime contracts, or bid or quote subcontracts and materials supplies on Department-assisted projects, including both DBEs and non-DBEs. For consulting companies, this list must include all Subconsultants contacting the Local Agency and expressing an interest in teaming with the Local Agency on a specific Department-assisted project. Prime

Contractors and Consultants must provide information for Numbers 1, 2, 3, and 4 and should provide any information they have available on Numbers 5, 6, 7, and 8 for themselves, and their Subcontractors and Subconsultants.

1. Federal Tax ID Number: _____
2. Firm Name: _____
3. Phone: _____
4. Address: _____

6. ☐ DBE
☐ Non-DBE

7. ☐ Subcontractor
☐ Subconsultant

8. Annual Gross Receipts
☐ Less than \$1 million
☐ Between \$1 - \$5 million
☐ Between \$5 - \$10 million
☐ Between \$10 - \$15 million
☐ More than \$15 million

5. Year Firm Established: _____

1. Federal Tax ID Number: _____
2. Firm Name: _____
3. Phone: _____
4. Address: _____

6. ☐ DBE
☐ Non-DBE

7. ☐ Subcontractor
☐ Subconsultant

8. Annual Gross Receipts
☐ Less than \$1 million
☐ Between \$1 - \$5 million
☐ Between \$5 - \$10 million
☐ Between \$10 - \$15 million
☐ More than \$15 million

5. Year Firm Established: _____

1. Federal Tax ID Number: _____
2. Firm Name: _____
3. Phone: _____
4. Address: _____

6. ☐ DBE
☐ Non-DBE

7. ☐ Subcontractor
☐ Subconsultant

8. Annual Gross Receipts
☐ Less than \$1 million
☐ Between \$1 - \$5 million
☐ Between \$5 - \$10 million
☐ Between \$10 - \$15 million
☐ More than \$15 million

5. Year Firm Established: _____

RESOURCES

**Florida Department of Transportation
Equal Opportunity Office**

<http://www.dot.state.fl.us/equalopportunityoffice/>

49 CFR Part 26

<http://www.dotcr.ost.dot.gov/asp/dbe.asp>

Bid Opportunity List

<http://formserver.dot.state.fl.us/MiscRepository/forms/27503010.pdf>

Disadvantaged Business Enterprise Directory

<https://www3.dot.state.fl.us/EqualOpportunityOffice/biznet/mainmenu.asp>

Federal Highway Administration

<http://www.fhwa.dot.gov/>

SECTION 1: PROJECT IDENTIFICATION				
1. Financial Project No.	2. F.A.P. No.	3. FDOT LAP Contract No.	4. County	5. District or Name of Local Agency
6. Prime Contractor's Name				
7. Company Name of Contractor, Supplier, Rental Company or Agency Submitting this certification				8. FEID No of Co. in Box 7
SECTION 2: CERTIFICATION STATEMENTS				
CERTIFICATION OF NONSEGREGATED FACILITIES <p>As a federally assisted construction contractor, I hereby certify: the following for this company:</p> <p>A. This company does not maintain or provide any segregated facilities for employees at any of our establishments and we do not permit our employees to perform their services at any location, under our control, where segregated facilities are maintained.</p> <p>B. Agreement that a breach of this certification is a violation of the equal opportunity clause in this contract.</p> <p>C. We will obtain and retain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the equal opportunity clause.</p> <p>As used in this certification, the terms "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and fountains, recreation or entertainment area, transportation, and housing facilities provided for employees which are segregated by explicit directives or are in fact segregated on the basis of race, color, religion or national origin because of habit, local custom, or any other reason.</p>		CERTIFICATION OF NON DISCRIMINATION <p>As a contractor, sub recipient or subcontractor on a Federally funded contract, this company certifies that it shall not discriminate on the basis of race, color, national origin, or sex in the performance of such contracts.</p> <p>The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT assisted contracts. The company agrees that a failure to carry out these requirements is a material breach of contract, which may result in the contract's termination or such other remedy as the recipient deems appropriate.</p> <p>Each subcontract, rental agreement and or material supplier agreement this company subsequently enters into for this contract will require this same Certification.</p> <p>It is the policy of this company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Actions include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay and other forms of compensation; and selection for training, including apprenticeship, pre apprenticeship, and/or on-the-job training.</p> <p>This certification extends to the project identified above and affirms our commitment to insure nondiscrimination and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions of FHWA-1273.</p> <p>Compliance with Title VI of the Civil Rights Act and the provisions of the American Disabilities Act of 1990 are incorporated in this certification.</p>		
9. Name (first/last) of corporate Official signing Certification		10. Job Title of person named in Box 9		
11. Signature of Certifying Official			12. Date of Signature	

Certification of Non Segregation & Non Discrimination Instructions for Completing Form

This form is provided to contractors on federally assisted road and bridge construction projects to affirm their commitment to nondiscrimination and non segregated facilities during the term of a contract.

Box 1: Fin. Proj No. – The Financial Project Number

Box 2: FAP No. – The Federal Aid Project Number assigned to federally funded projects or ‘non-FAP’

Box 3: FDOT LAP Contract No. – The project’s Local Area Project (‘LAP’) number

Box 4: County – County or counties project work is being performed in

Box 5: District or Local Agency – The Department’s District Number Designation where the project is located
Districts are 1-7, and the Turnpike District or the name of the city, county or entity administering the contract

Box 6: Prime Contractor Name – The name of the prime contractor.

Box 7: Company Name of Contractor, Supplier, Rental Company or Agency Submitting this certification –
name of company submitting the certification

Box 8: FEID No. – Federal Identification Number of company named in Box 7

Box 9: Name (first, last (of corporate official signing certification. – First name, last name

Box 10: Job Title of person named in Box 9 – job title

Box 11: Signature of Certifying Official – signature of person named in Box 9

Box 12: Date of signature – Month/day/year of signature

**IFB 11-2454-OV– Attachment “A”
Cortez Road @ 43rd Street West**

Project # 425530-1

County: Manatee

Project Description: Replace Existing Signals with Mast Arm Signals

Project Location: Cortez Road @ 43rd Street West, Bradenton

Contract Amount: TBD

All State and Federal EEO requirements are applicable to this project.

Each Local Agency is required to provide the following information to the District Local Agency Program (LAP) Administrator for verification. The District LAP Administrator will forward the information to the Equal Opportunity Office.

1. Anticipated DBE Participation Statement (Form No. 275-030-12)

The “Anticipated DBE Participation Statement” shall be completed and submitted by the Contractor at the pre-construction conference or by the Consultant during the negotiation process. The Statement must only include companies certified as a DBE. The Statement can and should be updated when additions or deletions are made through the life of the contract. This will not become a mandatory part of the contract. It will assist the Department in tracking planned or estimated DBE participation. The Local Agency must send the Statement to the District LAP Administrator or designee who will forward the information to the Department’s Equal Opportunity Office at the following address:

Florida Department of Transportation
Equal Opportunity Office
605 Suwannee Street. MS-65
Tallahassee, Florida 32399-0450
Fax Number: (850) 414-4879

2. Bid Opportunity List (Form #275-030-10)

Federal regulations require States to maintain a database of all firms that are participating or attempting to participate on FDOT -assisted contracts. The list must include all firms that bid on prime contracts or bid or quote subcontracts on FDOT –assisted projects, including both DBEs and non-DBEs. The Bid Opportunity List is used to record bidders’ information for all subcontractors or subconsultants who submitted bids to primes. This information should be returned with the bid package or proposal package. The local agency must send (mail, fax or email) the form to the Equal Opportunity Office at: Florida Department of Transportation, Equal Opportunity Office, 605 Suwannee Street. MS-65, Tallahassee, FL 32399-0450 – Fax Number: (850) 414-4879).

3. Instructions for Reporting Actual Payments

To comply with 49 Code of Federal Regulations (CFR) Part 26, the Department is also required to collect actual payments made to Subcontractors and Subconsultants in addition to the planned DBE participation. The Local Agency is required to report data on actual payments, minority status, and the type of work of all Subcontractors, Subconsultants, and major Suppliers. Each month the Local Agency must report actual payments to all DBE Subcontractors, Subconsultants, and Suppliers. Payments to all non-DBE Subcontractors and Subconsultants can be reported either monthly or at the end of the project. Local Agency may submit this information to the District LAP Administrator or designee manually or electronically in an Excel spreadsheet. This information will be forwarded to Joseph Salib, DBE Program Analyst at Joseph.Salib@dot.state.fl.us.

Prior to the beginning of work on the project, the prime contractor will receive and maintain the following EEO paperwork for their company and all subcontractors/rental agreements whose subcontracts/rental agreements are \$10,000 or more.

Equal Employment Opportunity (EEO)

1. Company EEO Requirements

Due from the Prime, subcontractors and Rental Agreements of \$10,000 or more.

- A. Certification of EEO Compliance (Form No. 700-011-13) - Monthly submission of the "Certification of Compliance with Equal Employment Opportunity Provisions on Federal Aid Contracts". Contractors are to ensure that records are developed and maintained to attest compliance with the requirements for the period covered by certification(s). Such records shall be retained for a period of three (3) years following completion of the contract work and shall be submitted each month with monthly invoice. Periodic compliance reviews will be performed to document compliance with these requirements. All records should be made available upon request.
 - a. EEO/ AA Policy Plan - A company must have a policy and plan established and implemented before the 1st workday of the project and made available upon request. If a contractor does not have one, procedures & information for implementing a policy can be found in the EEO Construction Contract Compliance Work Book on the Department's website. This plan should be submitted to the Equal Opportunity Office, Contract Compliance Section. Approvals are for a three-year period. It is
 - b. recommended that DBE AA Plans be submitted to the Equal Opportunity Office prior to the letting; however, they may be submitted with your bid. The Plan must be on your company's letterhead, signed by a company official, dated and contain all elements of an effective DBE/ AA Plan.
 - c. Supervisory & Office Personnel Meeting Minutes (Form No. 275-021-05) -The prime contractor, subcontractors, and rental agents must hold a Supervisory and Office Personnel EEO Meeting prior to the first work day. Subsequent meetings will be conducted at 6-month intervals or if inactive, within 30 days of resuming work. Within 30 days of hire or appointment, supervisory personnel and others involved in personnel matters are to be oriented in the required major topics and a record of that orientation (inclusive of date, topics, etc.) is to be maintained.

Equal Employment Opportunity (EEO)(Continued)

1. Company EEO Requirements

- d. Contractor Recruitment Program - which includes:
 - i. Good Faith Efforts
 - ii. Announcement of Equal Opportunity
 - iii. Advertisement in publications with a large minority circulation in the area where project work force is drawn
 - iv. Training of personnel involved in recruitment
 - v. Direct and systematic recruitment programs
 - vi. Recruit through public and private referral sources
 - vii. Encourage referrals from current employees
 - viii. Analysis and updating
 - ix. Record Keeping
- e. Non Segregated Facilities - Contractors are to insure that working conditions and facilities used or provided in association with employment are not discriminatory.
- f. Analysis for Non Discrimination - Contractors are to continually evaluate recruiting, hiring, interviewing, placement, promotion, termination and compensation practices for potential violation of equal opportunity and affirmative action requirements.
- B. EEO Officer Identification (Form No. 275-021-13) - The Prime Contractor and subcontractors are required to communicate their EEO Officer's appointment to FDOT by completing the EEO Officer Notification Form (No. 275-021-13) and mailing it to the Equal Opportunity Office in Tallahassee. Any changes to officer appointment, officer name or officer contact information may be directly input into the Equal Opportunity Reporting System or by mailing a copy of the EEO Officer Notification Form to the Equal Opportunity Office in Tallahassee. A copy of this form should be provided to the Local Agency.
- C. Company Wide EEO Report (Form No. 275-021-07)- The Prime Contractor shall make available a complete Company Wide EEO Report in the format shown on the Contractor's Company Wide EEO Report Form (No. 275-021-07) upon request by FDOT or the Local Agency to analyze the Contactor's workforce for EEO diversity.

2. Project EEO Requirements

Due from the Prime, subcontractors and Rental Agreements of \$10,000 or more.

Jobsite Bulletin Board - The posting of the following documents is requested to be in place on or before workers first appear on the project and must be kept in a presentable manner for the life of the project. Documents should be made weatherproof and accessible to all FDOT, project personnel and potential applicants. The documents will remain in place until workers are no longer present on the project. The following documentation must be posted on the project site.

2. Project EEO Requirements (Continued)

FDOT Standard Posters

1. EEO is the Law
2. Florida Law Prohibits Discrimination
3. Notice
4. Important
5. Wage Determination Appeal Process, and the Wage Rate decisions.

FDOT Project Specific Posters

1. EEO Officers (this information is to be maintained by the prime contractor during the term of the project and updated as necessary as prime contractor and sub contractor information changes.)
2. Wage Rate Decision(s)
3. Additional Wage Determinations (if applicable)

U.S. Dept. of Labor Posters

1. Family & Medical Leave Act Rights
2. OSHA: Save and Healthful Workplace Rights (English)
3. Employee Polygraph Protection

Required EEO Forms and Posters may be retrieved from the Departments Equal Opportunity website and forms library.

- B. EEO Information to Project Personnel (Form 275-021-06) - Contractors are to routinely inform their project employees of their equal employment opportunity civil rights, the contractor's policies, procedures and various wage/payroll protections. This information can be presented in meetings or through other appropriate means such as employee handbooks, notices and posters.
- C. Annual July EEO Report (Form No. 275-021-08) - The purpose of this report is to accumulate total employment on all federal aid highway projects in Florida as of July 31st. All full-time and part-time employees employed on the specific federal aid project (F AP) during the last "FULL" pay period in July must be accounted for by sex and race for each of the 15 job categories. This report is due to the FDOT by August 20th. You may submit this report into the FDOT EOR System or by mailing a copy of the completed form to the Local Agency to forward to FDOT-Jackie Brown's office.
- D. Project EEO Report (Form 275-010-12) - Contractors must report project workforce data by job category, race and sex as requested by the FDOT. This is to confirm contractor compliance. The project EEO Report is based on a single weekly pay period and that period is specified by FDOT or FHW A at the time of request.

3. On-The-Job Training Requirements (if applicable)

On-The-Job (OJT) Training Requirements IS applicable to this project. Based on the total construction dollars of \$??????? and ??????? construction days, there are 0 (zero) trainees required on this project. If you have any questions regarding OJT on this project, please make further inquiry with the FDOT-District One District Contract Compliance Manager (DCCM) or Resident Compliance Specialist.

4. Payroll & Wage Requirements

Local Agency personnel will conduct Labor Compliance and EEO Compliance Interviews (Form No. 700-010-63) in accordance with the Employee Interview Report - Labor/EEO Compliance form. We ask that you review the questions on this form, make your employees aware of these interviews and ask for their cooperation. Two (2) interviews a month, for each project, will be required.

5. Subcontractors

All subcontractors shall be pre-approved before working on this project. The following forms should be used to notify the Project Manager or sub-consultants being used and to obtain the proper approval.

- A. Subcontract Rental Agreements (Form 700-010-11) - Prime contractor must submit form to the LA advising of any rental agreement.
- B. Certification of Sublet Work (Form 700-010-36) - Prime contractor must submit form to Project Manager to advise and obtain approval of the subletting of work and the nature of the work. Updates to this form should be made and submitted as the information changes.
- C. Certification Disbursement of Previous Payment to Subcontractors (Form 700-010-38) - Contractor must submit an original executed notarized copy to the project Resident Compliance Specialist each month with monthly invoice.

6. Disadvantaged Business Enterprise (DBE)

- A. DBE UTILIZATION - Florida has a voluntary DBE program and while DBE utilization is not mandatory continued utilization of DBE Firms supports the success of Florida's voluntary DBE program and the contractor's EEO and DBE Affirmative Action Programs. Florida has a goal of 8.1 % DBE participation. Contractors are urged to utilize DBE's whenever possible.
- B. Anticipated DBE Participation Statement (Form No. 275-030-12) - The purpose of this form is to report to the FDOT the names and the dollars planned to be paid to DBE's for a specific contract. This form is mandatory and is due at the pre-construction meeting. You can submit to the FDOT thru the Local Agency within 3 days of the pre-con meeting. It should then be forwarded to Charles Reed (PBS&J) for further processing. Revised statements are required if DBE's are added/reduced or DBE contract dollars change. Note this form was revised as of 02/08 and is on the website.
- C. Equal Opportunity Reporting System (EORS) - DBE payments are to be input into the EOR System each month.

7. **Minority Participation** - Per Executive Order 11246, Affirmative Action requirements are located in the contract for minority and female participation expressed in percentage terms for the contractor's aggregate workforce in each trade on all construction work in the covered area. Also, be aware that you are subject to review by the US Dept. of Labor, OFCCP.
8. **Non-Compliance Issues** - Deficiency communications shall be issued to the prime contractor for the prime and/or subcontractor's non-compliance in any element of the program, including Disadvantaged Business Enterprise (DBE), Equal Employment Opportunity/Affirmative Action (EEO/AA), On-The-Job Training (OJT), Wage Rates and Certified Payrolls.
9. **Sanctions for Non-Compliance** - Two sanctions are concurrently applied when a performance deficiency exists: Withholding of Monthly Progress Estimate(s); Issuance of a Performance Deficiency Letter(s).
10. **NOTE** - All forms listed in this document are available for download at the FDOT website or from the project RSC.

The seal of Manatee County, Florida, is a circular emblem. It features a three-masted sailing ship on the water. To the left of the ship is a rising sun with rays. In the background, a city skyline is visible. The words "MANATEE COUNTY" are arched across the top, and "FLORIDA" is arched across the bottom.

FOR

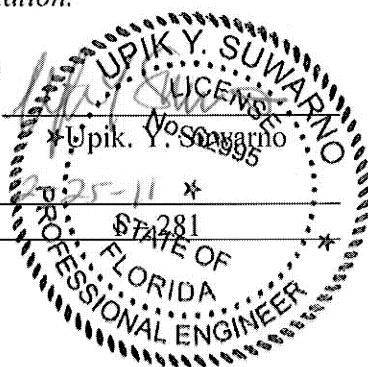
FEDERAL FUNDS

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 Florida Department of Transportation.

Signature
and Seal:

Date:

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SPECIAL PROVISIONS

DEFINITIONS AND TERMS

SECTION 1 language is added as follows:

1-3 Definitions.

The following terms, when used in the Contract Documents, have the meaning described:

Contractor's Engineer of Record.

A Professional Engineer registered in the State of Florida, other than the Engineer of Record or his subcontracted consultant, who undertakes the design and drawing of components of the permanent structure as part of a redesign or VECP, or for repair designs and details of the permanent work. The Contractor's Engineer of Record may also serve as the Specialty Engineer.

The Contractor's Engineer of Record must be an employee of a pre-qualified firm. The firm shall be pre-qualified in accordance with the Rules of the Department of Transportation, Chapter 14-75. Any Corporation or Partnership offering engineering services must hold a Certificate of Authorization from the Florida Department of Business and Professional Regulation.

As an alternate to being an employee of a pre-qualified firm, the Contractor's Engineer of Record may be a pre-qualified Specialty Engineer. For items of the permanent work declared by the State Construction Office to be "major" or "structural", the work performed by a pre-qualified Specialty Engineer must be checked by another pre-qualified Specialty Engineer. An individual Engineer may become pre-qualified in the work groups listed in the Rules of the Department of Transportation, Chapter 14-75, if the requirements for the Professional Engineer are met for the individual work groups. Pre-qualified Specialty Engineers are listed on the State Construction Website. Pre-qualified Specialty Engineers will not be authorized to perform redesigns or VECP designs of items fully detailed in the plans.

Department.

Manatee County.

Engineer.

The Professional Engineer, registered in the State of Florida, other than the Engineer of Record or his subcontracted consultant, acting as the project's Construction Engineering Inspection Manager. The Engineer may be County in-house staff or a consultant retained by the County.

Note: In order to avoid cumbersome and confusing repetition of expressions in these Specifications, it is provided that whenever anything is, or is to be done, if, as, or, when, or where "acceptable, accepted, approval, approved, authorized, condemned, considered necessary, contemplated, deemed necessary, designated, determined, directed, disapproved, established, given, indicated, insufficient, ordered, permitted, rejected, required, reserved, satisfactory, specified, sufficient, suitable, suspended, unacceptable, or unsatisfactory," it shall be understood as if the expression were followed by the words "by the Engineer," "to the Engineer," or "of the Engineer."

Specialty Engineer.

A Professional Engineer registered in the State of Florida, other than the Engineer of Record or his subcontracted consultant, who undertakes the design and drawing preparation of components, systems, or installation methods and equipment for specific temporary portions of the project work or for special items of the permanent works not fully detailed in the plans and required to be furnished by the Contractor such as but not limited to pot bearing designs, non-standard expansion joints, MSE wall designs and other specialty items. The Specialty Engineer may also provide designs and details for items of the permanent work declared by the State Construction Office to be “minor” or “non-structural”. The Specialty Engineer may be an employee or officer of the Contractor or a fabricator, an employee or officer of an entity providing components to a fabricator, or an independent consultant.

For items of work not specifically covered by the Rules of the Department of Transportation, a Specialty Engineer is qualified if he has the following qualifications:

- (1) Registration as a Professional Engineer in the State of Florida.
- (2) The education and experience necessary to perform the submitted design as required by the Florida Department of Business and Professional Regulation.

SCOPE OF THE WORK

SECTION 4 language is added as follows:

4-3.1 General: When the Department 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 Department finds that such work is essential to the satisfactory completion of the Contract within its intended scope, the Department will make an adjustment to the Contract. The Engineer will determine the basis of payment for such an adjustment in a fair and equitable amount.

The term “significant change” applies only when the Engineer determines that the character of the work, as altered, differs materially in kind or nature from that involved or included in the original proposed construction. The allowance due to the Contractor will be determined by the Department.

In the instance of an alleged “significant change”, the determination by the Engineer shall be conclusive and shall not be subject to challenge by the Contractor in any forum, except upon the Contractor establishing by clear and convincing proof that the determination by the Engineer was without any reasonable and good-faith basis.

CONTROL OF THE WORK

SECTION 5 language is added as follows:

5-11 Final Acceptance.

When, upon completion of the final construction inspection of the entire project, the Engineer determines that the Contractor has satisfactorily completed the work, the Engineer will give the Contractor written notice of final acceptance.

CONTROL OF MATERIALS

SECTION 6 language is added as follows:

6-1 Acceptance Criteria.

6-1.1 General: Acceptance of materials is based on the following criteria. All requirements may not apply to all materials. Use only materials in the work that meet the requirements of these Specifications. The Engineer may inspect and test any material, at points of production, distribution and use.

6-1.2 Sampling and Testing: Use the Department's current sample identification and tracking system to provide related information and attach the information to each sample. Restore immediately any site from which material has been removed for sampling purposes to the pre-sampled condition with materials and construction methods used in the initial construction, at no additional cost to the Department.

Ensure when a material is delivered to the location as described in the Contract Documents, there is enough material delivered to take samples, at no expense to the Department.

6-1.2.1 Pretest by Manufacturers: Submit certified manufacturer's test results to the Engineer for qualification and use on Department projects. Testing will be as specified in the Contract Documents. The Department may require that manufacturers submit samples of materials for independent verification purposes.

6-1.2.2 Point of Production Test: Test the material during production as specified in the Contract Documents.

6-1.2.3 Point of Distribution Test: Test the material at Distribution facilities as specified in the Contract Documents.

6-1.2.4 Point of Use Test: Test the material immediately following placement as specified in the Specifications. After delivery to the project, the Department may require the retesting of materials that have been tested and accepted at the source of supply, or may require the testing of materials that are to be accepted by Producer Certification. The Department may reject all materials that, when retested, do not meet the requirements of these Specifications.

6-1.3 Certification:

6-1.3.1 Producer Certification: Provide complete certifications for materials as required. Furnish to the Engineer for approval, Producer Certifications for all products listed on the Qualified Products List and when required by the applicable material Specification(s). Do not incorporate any manufactured products or materials into the project without approval from the Engineer. Materials will not be considered for payment when not accompanied by Producer Certification. Producers may obtain sample certification forms through the Department's website. Ensure that the certification is provided on the producer's letterhead and is signed by a legally responsible person from the producer and notarized.

6-1.3.1.1 Qualified Products List: The Product Evaluation Section in the State Specifications and Estimates Office publishes and maintains a Qualified Products List. This list provides assurance to Contractors, consultants, designers, and Department personnel that specific products and materials are approved for use on Department facilities. The Department will limit the Contractor's use of products and materials that require pre-approval to items listed on the Qualified Products List effective at the time of placement.

Manufacturers seeking evaluation in accordance with Departmental procedures of an item must submit a Product Evaluation Application, available on the Department's website

www2.dot.state.fl.us/specificationsestimates/productevaluation/qpl/submittalprocess.aspx , with supporting documentation as defined and detailed by the applicable Specifications and Standards. This may include certified test reports from an independent test laboratory, certification that the material meets all applicable specifications, signed and sealed drawings and calculations, quality control plans, samples, infrared scans, or other technical data.

Manufacturers successfully completing the Department's evaluation are eligible for inclusion on the Qualified Products List. The Department will consider any marked variations from original test values for a material or any evidence of inadequate field performance of a material as sufficient evidence that the properties of the material have changed, and the Department will remove the material from the Qualified Products List.

6-1.3.1.2 Approved Products List: The State Traffic Operations Office maintains the Approved Products List of Traffic Control Signal Devices. Traffic Monitoring Site Equipment and Materials are also included on the Approved Products List. This list provides assurance to Maintaining Agencies, Contractors, consultants, designers, and Department personnel that the specific items listed are approved for use on Department facilities. The Department will limit the Contractor's procurement and use of Traffic Control Signal Devices, and Traffic Monitoring Site equipment and materials to only those items listed on the Approved Products List that is effective at the time of procurement, except as provided in Section 603.

The approval process is described in detail on the State Traffic Operation website, www.dot.state.fl.us/trafficoperations/terl/apl2.htm . Manufacturers seeking evaluation of a specific device must submit an application which can be obtained from the State Traffic Operations Office.

6-1.3.2 Contractor Installation Certification: Provide installation certifications as required by the Contract Documents.

6-2 Applicable Documented Authorities other than Specifications.

6-2.1 General: Details on individual materials are identified in various material specific Sections of the Specifications that may refer to other documented authorities for requirements. When specified, meet the requirements as defined in such references.

6-2.2 Test Methods: Methods of sampling and testing materials are in accordance with the Florida Methods (FM). If a Florida Method does not exist for a particular test, perform the testing in accordance with the method specified in the Specification. When test methods or other standards are referenced in the Specifications without identification of the specific time of issuance, use the most current issuance, including interims or addendums thereto, at the time of bid opening.

6-2.3 Construction Aggregates: Aggregates used on Department projects must be in accordance with Rule 14-103, FAC.

6-3 Storage of Materials and Samples.

6-3.1 Method of Storage: Store materials in such a manner as to preserve their quality and fitness for the work, to facilitate prompt inspection, and to minimize noise impacts on sensitive receivers. More detailed specifications concerning the storage of specific materials are prescribed under the applicable Specifications. The Department may reject improperly stored materials.

6-3.2 Use of Right-of-Way for Storage: If the Engineer allows, the Contractor may use a portion of the right-of-way for storage purposes and for placing the Contractor's plant and equipment. Use only the portion of the right-of-way that is outside the clear zone, which is the

portion not required for public vehicular or pedestrian travel. When used, restore the right-of-way to pre-construction condition at no additional cost to the Department or as specified in the Contract Documents. Provide any additional space required at no expense to the Department.

6-3.3 Responsibility for Stored Materials: Accept responsibility for the protection of stored materials. The Department is not liable for any loss of materials, by theft or otherwise, or for any damage to the stored materials.

6-3.4 Storage Facilities For Samples: Provide facilities for storage of samples as described in the Contract Documents and warranted by the test methods and Specifications.

6-4 Defective Materials.

Materials not meeting the requirements of these Specifications will be considered defective. The Engineer will reject all such materials, whether in place or not. Remove all rejected material immediately from the site of the work and from storage areas, at no expense to the Department.

Do not use material that has been rejected and the defects corrected, until the Engineer has approved the material's use. Upon failure to comply promptly with any order of the Engineer made under the provisions of this Article, the Engineer will remove and replace defective material and deduct the cost of removal and replacement from any moneys due or to become due the Contractor.

As an exception to the above, the Contractor may submit, upon approval of the Engineer, an engineering and/or laboratory analysis to evaluate the effect of defective in place materials. A Specialty Engineer, who is an independent consultant or the Contractor's Engineer of Record as stated within each individual Section shall perform any such analysis. The Engineer will determine the final disposition of the material after review of the information submitted by the Contractor. No additional monetary compensation or time extension will be granted for the impact of any such analysis or review.

6-5 Products and Source of Supply.

6-5.3 Unfit, Hazardous, and Dangerous Materials: Do not use any material that, after approval and/or placement, has in any way become unfit for use. Do not use materials containing any substance that has been determined to be hazardous by the State of Florida Department of Environmental Protection or the U.S. Department of Environmental Protection. Provide workplaces free from serious recognized hazards and to comply with occupational safety and health standards, as determined by the U.S. Department of Labor Occupational Safety and Health Administration.

LEGAL REQUIREMENTS AND RESPONSIBILITIES TO THE PUBLIC

SECTION 7 language is added as follows:

7-1.3 Introduction or Release of Prohibited Aquatic Plants, Plant Pests, or Noxious Weeds: Do not introduce or release prohibited aquatic plants, plant pests, or noxious weeds into the project limits as a result of clearing and grubbing, earthwork, grassing and mulching, sodding, landscaping, or other such activities. Immediately notify the Engineer upon discovery of all prohibited aquatic plants, plant pests, or noxious weeds within the project limits. Do not move prohibited aquatic plants, plant pests, or noxious weeds within the project limits or to

locations outside of the project limits without the Engineer's permission. Maintain all borrow material brought onto the project site free of prohibited aquatic plants, plant pests, noxious weeds, and their reproductive parts. Refer to Rule 16C-52 and Rule 5B-57, of the Florida Administrative Code for the definition of prohibited aquatic plants, plant pests, and noxious weeds.

Furnish the Engineer, prior to incorporation into the project, with a certification from the Florida Department of Agriculture and Consumer Services, Division of Plant Industry, stating that the sod, hay, straw, and mulch materials are free of noxious weeds, including Tropical Soda Apple.

7-1.7 Insecticides and Herbicides. Use products found on the following website, www.flpesticide.us/, approved by the Florida Department of Agriculture for the State of Florida. The use of restricted products is prohibited. Do not use any products in the sulfonylurea family of chemicals. Herbicide application by broadcast spraying is not allowed.

Procure any necessary licenses, pay all charges and fees, and give all notices necessary for lawful performance of the work.

Ensure that all employees applying insecticides and herbicides possess a current Florida Department of Agriculture Commercial Applicator license with the categories of licensure in Right-of-Way Pest Control and Aquatic Pest Control. Provide a copy of current certificates upon request, to the Engineer.

Ensure that employees who work with herbicides comply with all applicable Federal, State, and local regulations.

Comply with all regulations and permits issued by any regulatory agency within whose jurisdiction work is being performed. Post all permit placards in a protected, conspicuous location at the work site.

Acquire any permits required for work performed on the rights-of-way within the jurisdiction of National Forests in Florida. Contact the Local National Forest Ranger District, or the United States Department of Agriculture (USDA) office for the proper permits and subsequent approval.

Acquire all permits required for aquatic plant control as outlined in Chapter 62C-20, Florida Administrative Code, Rules of the Florida Department of Environmental Protection. Contact the Regional Field Office of Bureau of Invasive Plant Management of the Florida Department of Environmental Protection for proper permits and subsequent approval. If application of synthetic organo-auxin herbicides is necessary, meet the requirements of Chapter 5E-2, Florida Administrative Code.

7-7.2 Overloaded Equipment. Do not operate on any road or street any hauling unit or equipment loaded in excess of (1) the maximum weights specified in the Florida Uniform Traffic Control Law, or (2) lower weights legally established for any section of road or bridge by the Department or local authorities. The governmental unit having jurisdiction over a particular road or bridge may provide exceptions by special permit under the provisions of 7.0. This restriction applies to all roads and bridges inside and outside the Contract limits as long as these roads and bridges are open for public use. The Contractor may overload roads and bridges which are to be demolished after they are permanently closed to the public. The Contractor is responsible for all loss or damages resulting from equipment operated on a structure permanently closed to the public.

7-7.5 Contractor's Equipment on Bridge Structures. The Specialty Engineer shall analyze the effect of imposed loads on bridge structures, within the limits of a construction

contract, resulting from the following operations:

- (1) Overloaded Equipment as defined 6.0:
 - (a) Operating on or crossing over completed bridge structures.
 - (b) Operating on or crossing over partially completed bridge structures.
- (2) Equipment within legal load limits:
 - (a) Operating on or crossing over partially completed bridge structures.
- (3) Construction cranes:
 - (a) Operating on completed bridge structures.
 - (b) Operating on partially completed bridge structures.

Any pipe culvert(s) or box culvert(s) qualifying as a bridge under 1-3 is excluded from the requirements above.

A completed bridge structure is a bridge structure in which all elemental components comprising the load carrying assembly have been completed, assembled, and connected in their final position. The components to be considered shall also include any related members transferring load to any bridge structure.

The Specialty Engineer shall determine the effect that equipment loads have on the bridge structure and develop the procedures for using the loaded equipment without exceeding the structure's design load capacity.

Submit to the Department for approval eight copies of design calculations, layout drawings, and erection drawings showing how the equipment is to be used so that the bridge structure will not be overstressed. The Specialty Engineer shall sign and seal one set of the eight copies of the drawings and the cover sheet of one of the eight copies of the calculations for the Department's Record Set.

MEASUREMENT AND PAYMENT

SECTION 9 language is added as follows:

9-1.3 Determination of Pay Areas:

9-1.3.1 Final Calculation: When measuring items paid for on the basis of area of finished work, where the pay quantity is designated to be determined by calculation, the Engineer will use lengths and widths in the calculations based on the station to station dimensions shown on the plans; the station to station dimensions actually constructed within the limits designated by the Engineer; or the final dimensions measured along the surface of the completed work within the neat lines shown on the plans or designated by the Engineer. The Engineer will use the method or combination of methods of measurement that reflect, with reasonable accuracy, the actual surface area of the finished work as the Engineer determines.

9-1.3.2 Plan Quantity: When measuring items paid for on the basis of area of finished work, where the pay quantity is designated to be the plan quantity, the Engineer will determine the final pay quantity based on the plan quantity subject to the provisions of 9-3.2. Generally, the Engineer will calculate the plan quantity using lengths based on station to station dimensions and widths based on neat lines shown in the plans.

9-3 Compensation for Altered Quantities.

9-3.1 General: When alteration in plans or quantities of work not requiring a supplemental agreement as hereinbefore provided for are offered and performed, the Contractor

shall accept payment in full at Contract unit bid prices for the actual quantities of work done, and no allowance will be made for increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor, resulting either directly from such alterations, or indirectly from unbalanced allocation among the Contract items of overhead expense on the part of the bidder and subsequent loss of expected reimbursement therefore, or from any other cause.

Compensation for alterations in plans or quantities of work requiring supplemental agreements shall be stipulated in such agreement, except when the Contractor proceeds with the work without change of price being agreed upon, the Contractor shall be paid for such increased or decreased quantities at the Contract unit prices bid in the Proposal for the items of work. If no Contract unit price is provided in the Contract, and the parties cannot agree as to a price for the work, the Contractor agrees to do the work in accordance with 4-3.2.

9-3.2 Payment Based on Plan Quantity:

9-3.2.1 Error in Plan Quantity: As used in this Article, the term “substantial error” is defined as the smaller of (a) or (b) below:

- (a) a difference between the original plan quantity and final quantity of more than 5%,
- (b) a change in quantity which causes a change in the amount payable of more than \$5,000.

On multiple job Contracts, changes made to an individual pay item due to substantial errors will be based on the entire Contract quantity for that pay item.

Where the pay quantity for any item is designated to be the original plan quantity, the Department will revise such quantity only in the event that the Department determines it is in substantial error. In general, the Department will determine such revisions by final measurement, plan calculations, or both, as additions to or deductions from plan quantities.

In the event that either the Department or the Contractor contends that the plan quantity for any item is in error and additional or less compensation is thereby due, the claimant shall submit, at their own expense, evidence of such in the form of acceptable and verifiable measurements or calculations. The Department will not revise the plan quantity solely on the basis of a particular method of construction that the Contractor selects. For earthwork items, the claimant must note any differences in the original ground surfaces from that shown in the original plan cross-sections that would result in a substantial error to the plan quantity, and must be properly documented by appropriate verifiable level notes, acceptable to both the Contractor and the Department, prior to disturbance of the original ground surface by construction operations. The claimant shall support any claim based upon a substantial error for differences in the original ground surface by documentation as provided above.

9-3.2.2 Authorized Changes in Limits of Work: Where the Department designates the pay quantity for any item to be the original plan quantity and authorizes a plan change which results in an increase or decrease in the quantity of that item, the Department will revise the plan quantity accordingly. In general, the Department will determine such revisions by final measurement, plan calculations or both.

9-3.2.3 Specified Adjustments to Pay Quantities: Do not apply the limitations specified in 9-3.2.1 and 9-3.2.2 to the following:

- (1) Where these Specifications or Special Provisions provide that the Department determines the pay quantity for an item on the basis of area of finished work adjusted in accordance with the ratio of measured thickness to nominal thickness.

(2) Where these Specifications provide for a deduction due to test results falling outside of the allowable specified tolerances.

(3) To payment for extra length fence posts, as specified in 550-6.3.

9-3.3 Lump Sum Quantities:

9-3.3.1 Error in Lump Sum Quantity: Where the Department designates the pay quantity for an item to be a lump sum and the plans show an estimated quantity, the Department will adjust the lump sum compensation only in the event that either the Contractor submits satisfactory evidence or the Department determines and furnishes satisfactory evidence that the lump sum quantity shown is in substantial error as defined in 9-3.2.1.

MAINTENANCE OF TRAFFIC.

(REV 10-7-10) (1-11)

SUBARTICLE 102-13.12.1 (of the Supplemental Specifications) is deleted and the following substituted:

102-13.12.1 Redirective: Price and payment will be full compensation for furnishing, installing, maintaining and subsequently removing such crash cushions. Payment for restoring damaged crash cushions will be the manufacturer's/distributor's invoice price for the new materials/parts plus 20% markup. The 20% markup is compensation for all necessary work, including but not limited to labor, equipment, supplies and profit, as authorized by the Engineer. Additional MOT required for the repair of the crash cushion will be paid for under the appropriate MOT pay item.

CRASH CUSHIONS.

(REV 10-7-10) (1-11)

ARTICLE 544-4 (of the Supplemental Specifications) is deleted and the following substituted:

544-4 Compensation.

Price and payment will be full compensation for the complete system or module in place and accepted, including object marker or sheeting. Payment for restoring damaged crash cushions will be the manufacturer's/distributor's invoice price for the new materials/parts plus 20% markup. The 20% markup is compensation for all necessary work, including but not limited to labor, equipment, supplies and profit, as authorized by the Engineer.

Relocation of an existing crash cushion to a permanent location called for in the plans shall be paid for at the Contract unit price for relocating existing systems. Price and payment will be full compensation for relocating and reinstalling the system in accordance with the manufacturer's instructions and the Design Standards.

Payment will be made under:

Item No. 544- 74-	Relocate Crash Cushion - each.
Item No. 544- 75-	Crash Cushion - each.

SUPPLEMENTAL SPECIFICATIONS

102 MAINTENANCE OF TRAFFIC.
(REV 8-10-10) (FA 8-16-10) (1-11)

SECTION 102 (Pages 109–126) is deleted and the following substituted:

SECTION 102
MAINTENANCE OF TRAFFIC

102-1 Description.

Maintain traffic within the limits of the project for the duration of the construction period, including any temporary suspensions of the work. Construct and maintain detours. Provide facilities for access to residences, businesses, etc., along the project. Furnish, install and maintain traffic control and safety devices during construction. Furnish and install work zone pavement markings for maintenance of traffic in construction areas. Provide any other special requirements for safe and expeditious movement of traffic specified on the plans. Maintenance of Traffic includes all facilities, devices and operations as required for safety and convenience of the public within the work zone.

Do not maintain traffic over those portions of the project where no work is to be accomplished or where construction operations will not affect existing roads. Do not obstruct or create a hazard to any traffic during the performance of the work, and repair any damage to existing pavement open to traffic.

Include the cost of any work that is necessary to meet the requirements of the Contract Documents under the MOT pay item, when there is not a pay item provided.

102-2 Materials.

Meet the following requirements:

Bituminous Adhesive.....	Section 970
Temporary Retroreflective Pavement Markers...	Section 990
Paint	Section 971
Removable Tape	Section 990
Glass Spheres.....	Section 971
Temporary Traffic Control Device Materials	Section 990
Retroreflective and Nonreflective Sheeting for Temporary Traffic Control Devices.....	Section 994

102-2.1 Temporary Traffic Control Devices: Use only the materials meeting the requirements of Section 990, Section 994, Design Standards and the MUTCD.

102-2.2 Detour: Provide all materials for the construction and maintenance of all detours.

102-2.3 Commercial Materials for Driveway Maintenance: Provide materials of the type typically used for base, including recycled asphalt pavement material, and having stability and drainage properties that will provide a firm surface under wet conditions.

102-3 Specific Requirements.

102-3.1 Beginning Date of Contractor's Responsibility: Maintain traffic starting the day work begins on the project or on the first day Contract time is charged, whichever is earlier.

102-3.2 Worksite Traffic Supervisor: Provide a Worksite Traffic Supervisor in accordance with Section 105. Provide the Worksite Traffic Supervisor with all equipment and materials needed to set up, take down, maintain traffic control, and handle traffic-related situations.

Ensure that the Worksite Traffic Supervisor performs the following duties:

1. Performs on site direction of all traffic control on the project.
2. Is on site during all set up and take down, and performs a drive through inspection immediately after set up.
3. Is on site during all nighttime operations to ensure proper Maintenance of Traffic.
4. Immediately corrects all safety deficiencies and does not permit minor deficiencies that are not immediate safety hazards to remain uncorrected for more than 24 hours.
5. Is available on a 24-hour per day basis and present within 45 minutes after notification of an emergency situation and is prepared to positively respond to repair the work zone traffic control or to provide alternate traffic arrangements.
6. Conducts daily daytime and weekly nighttime inspections of projects with predominately daytime work activities, and daily nighttime and weekly daytime inspections of projects with predominantly nighttime work activities of all traffic control devices, traffic flow, pedestrian, bicyclist, and business accommodations.

Advise the project personnel of the schedule of these inspections and give them the opportunity to join in the inspection as is deemed necessary. Submit a comprehensive weekly report, using the Department's currently approved form, to the Engineer detailing the condition of all traffic control devices (including pavement markings) being used. Include assurances in the inspection report that pedestrians are accommodated with a safe travel path around work sites and safely separated from mainline traffic, that existing or detoured bicyclist paths are being maintained satisfactorily throughout the project limits, and that existing businesses in work areas are being provided with adequate entrances for vehicular and pedestrian traffic during business hours. Have the Worksite Traffic Supervisor sign the report and certify that all of the above issues are being handled in accordance with the Contract Documents. When deficiencies are found, the Worksite Traffic Supervisor is to note such deficiencies and include the proposed corrective actions, including the date corrected.

The Department may disqualify and remove from the project a Worksite Traffic Supervisor who fails to comply with the provisions of this Section. The Department may temporarily suspend all activities, except traffic, erosion control and such other activities that are necessary for project maintenance and safety, for failure to comply with these provisions.

102-4 Alternative Traffic Control Plan.

The Contractor may propose an alternative Traffic Control Plan (TCP) to the plan presented in the Contract Documents. Have the Contractor's Engineer of Record sign and seal the alternative plan. Prepare the TCP in conformance with and in the form outlined in the current version of the Roadway Plans Preparation Manual. Indicate in the plan a TCP for each phase of activities. Take responsibility for identifying and assessing any potential impacts to a utility that may be caused by the alternate TCP proposed by the Contractor, and notify the Department in writing of any such potential impacts to utilities.

Engineer's approval of the alternate TCP does not relieve the Contractor of sole responsibility for all utility impacts, costs, delays or damages, whether direct or indirect, resulting from Contractor initiated changes in the design or construction activities from those in the original Contract Specifications, design plans (including traffic control plans) or other Contract Documents and which effect a change in utility work different from that shown in the utility plans, joint project agreements or utility relocation schedules.

The Department reserves the right to reject any Alternative Traffic Control Plan. Obtain the Engineer's written approval before beginning work using an alternate TCP. The Engineer's written approval is required for all modifications to the TCP. The Engineer will only allow changes to the TCP in an emergency without the proper documentation.

102-5 Traffic Control.

102-5.1 Standards: FDOT Design Standards (DS) are the minimum standards for the use in the development of all traffic control plans. The MUTCD Part VI is the minimum national standard for traffic control for highway construction, maintenance, and utility operations. Follow the basic principles and minimum standards contained in these documents for the design, application, installation, maintenance, and removal of all traffic control devices, warning devices and barriers which are necessary to protect the public and workers from hazards within the project limits.

102-5.2 Maintenance of Roadway Surfaces: Maintain all lanes that are being used for the maintenance of traffic, including those on detours and temporary facilities, under all weather conditions. Keep the lanes reasonably free of dust, potholes and rutting. Provide the lanes with the drainage facilities necessary to maintain a smooth riding surface under all weather conditions.

102-5.3 Number of Traffic Lanes: Maintain one lane of traffic in each direction. Maintain two lanes of traffic in each direction at existing four (or more) lane cross roads, where necessary to avoid undue traffic congestion. Construct each lane used for maintenance of traffic at least as wide as the traffic lanes existing in the area before commencement of construction. Do not allow traffic control and warning devices to encroach on lanes used for maintenance of traffic.

The Engineer may allow the Contractor to restrict traffic to one-way operation for short periods of time provided that the Contractor employs adequate means of traffic control and does not unreasonably delay traffic. When a construction activity requires restricting traffic to one-way operations, locate the flaggers within view of each other when possible. When visual contact between flaggers is not possible, equip them with 2-way radios, official, or pilot vehicle(s), or use traffic signals.

102-5.4 Crossings and Intersections: Provide and maintain adequate accommodations for intersecting and crossing traffic. Do not block or unduly restrict any road or street crossing the project unless approved by the Engineer. Maintain all existing actuated or traffic responsive mode signal operations for main and side street movements for the duration of the Contract. Restore any loss of detection within 12 hours. Use only detection technology listed on the Department's Approved Products List (APL) and approved by the Engineer to restore detection capabilities.

Before beginning any construction, provide the Engineer a plan for maintaining detection devices for each intersection and the name(s) and phone numbers of persons that can be contacted when signal operation malfunctions.

102-5.5 Access for Residences and Businesses: Provide continuous access to all residences and all places of business.

102-5.6 Protection of the Work from Injury by Traffic: Where traffic would be injurious to a base, surface course, or structure constructed as a part of the work, maintain all traffic outside the limits of such areas until the potential for injury no longer exists.

102-5.7 Flagger: Provide trained flaggers in accordance with Section 105.

102-5.8 Conflicting Pavement Markings: Where the lane use or where normal vehicle or pedestrian paths are altered during construction, remove all pavement markings (paint, tape, thermoplastic, raised pavement markers, etc.) that will conflict with the adjusted vehicle or pedestrian paths. Use of paint to cover conflicting pavement markings is prohibited. Remove conflicting pavement markings using a method that will not damage the surface texture of the pavement and which will eliminate the previous marking pattern regardless of weather and light conditions.

Remove all pavement markings that will be in conflict with “next phase of operation” vehicle pedestrian paths as described above, before opening to vehicle traffic or use by pedestrians.

Cost for removing conflicting pavement markings (paint, tape, thermoplastic, raised pavement markers, etc.) to be included in Maintenance of Traffic, Lump Sum.

102-5.9 Vehicle and Equipment Visibility: Equip all pickups and automobiles used on the project with a minimum of one Class 2 amber or white warning light that meets the Society of Automotive Engineers Recommended Practice SAE J595, dated November 1, 2008, or SAE J845, dated December 1, 2007, and incorporated herein by reference. Existing lights that meet SAE J845, dated March, 1992, or SAE J1318, dated April, 1986, may be used to its end of service life. Lights should be unobstructed by ancillary vehicle equipment such as ladders, racks or booms. If the light is obstructed, additional lights will be required. The lights shall be operating when a vehicle is in a work area where a potential hazard exists, when operating the vehicle at less than the average speed for the facility while performing work activities, making frequent stops or called for in the plans or Design Standards.

Equip all other vehicles and equipment with a minimum of 4 square feet of retroreflective sheeting or flashing lights.

To avoid distraction to motorists, do not operate the lights on the vehicles or equipment when the vehicles are outside the clear zone or behind a barrier.

102-5.10 No Waiver of Liability: Conduct operations in such a manner that no undue hazard results due to the requirements of this Article. The procedures and policies described herein in no way acts as a waiver of any terms of the liability of the Contractor or his surety.

102-6 Detours.

102-6.1 General: Construct and maintain detour facilities wherever it becomes necessary to divert traffic from any existing roadway or bridge, or wherever construction operations block the flow of traffic.

102-6.2 Construction: Plan, construct, and maintain detours for the safe passage of traffic in all conditions of weather. Provide the detour with all facilities necessary to meet this requirement.

Where the plans call for the Department to furnish detour bridge components, construct the pile bents in accordance with the plans, unless otherwise authorized by the Engineer.

Submit a letter with the following: company name, phone number, office address, project contact person, project number, detour bridge type, bridge length, span length, location and usage time frames, to the Engineer at least 30 calendar days before the intended pick-up date, to obtain the storage facility location and list of components for the project. Upon receipt of letter, the Engineer will, within ten calendar days provide an approved material list to the Contractor and the appropriate Department storage yard.

Provide a letter with an original company seal, identifying the representative with authority to pick up components, to the Engineer at least ten calendar days before the proposed pick-up date. The Department is not obligated to load the bridge components without this notice. Take responsibility and sign for each item loaded at the time of issuance.

Provide timber dunnage, and transport the bridge components from the designated storage facility to the job site. Unload, erect, and maintain the bridge, then dismantle the bridge and load and return the components to the designated storage facility.

Notify the Engineer in writing at least ten calendar days before returning the components. Include in this notice the name of the Contractor's representative authorized to sign for return of the bridge components. The yard supervisor is not obligated to unload the bridge components without this notice.

The Department will provide equipment and an operator at the Department's storage facility to assist in loading and unloading the bridge components. Furnish all other labor and equipment required for loading and unloading the components.

The Departments representative will record all bridge components issued or returned on the Detour Bridge Issue and Credit Ticket. The Tickets must be signed by a Department and Contractor representative, after loading or unloading each truck to document the quantity and type of bridging issued or returned.

Bind together all bridge components to be returned in accordance with the instructions given by the storage facility. The yard supervisor will repack components that are not packed in compliance with these instructions. Upon request, written packing instructions will be made available to the Contractor, before dismantling of the bridge for return to the Department's storage facility.

Assume responsibility for any shortage or damage to the bridge components. Monies due the Contractor will be reduced at the rate of \$35.00 per hour plus materials for repacking, repairs or replacement of bridge components.

The skid resistance of open steel grid decking on the detour bridge may decrease gradually after opening the bridge to traffic. The Department will furnish a pneumatic floor scabbler machine for roughening the roadway surface of the detour bridge decking. Provide an air compressor at the job site with 200 ft³/minute capacity, 90 psi air pressure for the power supply of the machine, and an operator. Transport the scabbler machine to and from the Department's Structures Shop. Repair any damage to the scabbler machine caused by operations at no expense to the Department. Perform scabbling when determined necessary by the Engineer. The Department will pay for the cost of scabbling as Unforeseeable Work in accordance with 4-4.

Return the bridge components to the designated storage facility beginning no later than ten calendar days after the date the detour bridge is no longer needed, the date the new bridge is placed in service, or the date Contract Time expires, whichever is earliest. Return the detour bridging at an average of not less than 200 feet per week. Upon failure to return the bridge components to the Department within the time specified, compensate the Department for the

bridge components not returned at the rate of \$5.00 per 10 feet, per day, per bridge, for single lane; and \$10.00 per 10 feet, per day, per bridge, for dual lane until the bridge components are returned to the Department.

102-6.3 Construction Methods: Select and use construction methods and materials that provide a stable and safe detour facility. Construct the detour facility to have sufficient durability to remain in good condition, supplemented by maintenance, for the entire period that the detour is required.

102-6.4 Removal of Detours: Remove detours when they are no longer needed and before the Contract is completed. Take ownership of all materials from the detour and dispose of them, except for materials, which might be on loan from the Department with the stipulation that they are returned.

102-6.5 Detours Over Existing Roads and Streets: When the Department specifies that traffic be detoured over roads or streets outside the project area, do not maintain such roads or streets. However, maintain all signs and other devices placed for the purpose of the detour.

102-6.6 Operation of Existing Movable Bridges: The Department will maintain and operate existing moveable bridges that are to be removed by the Contractor until such time as they are closed to traffic. During this period, make immediate repairs of any damage to such structures caused by use or operations related to the work at no expense to the Department, but do not provide routine repairs or maintenance. In the event that use or operations result in damage to a bridge requiring repairs, give such repairs top priority to any equipment, material, or labor available.

102-7 Traffic Control Officer.

Provide uniformed law enforcement officers, including marked law enforcement vehicles, to assist in controlling and directing traffic in the work zone when the following types of work is necessary on projects:

1. Traffic control in a signalized intersection when signals are not in use.
2. When Standard Index No. 619 is used on Interstate at nighttime and called for in the plans.
3. When Standard Index No. 655 Traffic Pacing for overhead work is called for in the plans or approved by the Engineer.
4. When pulling conductor/cable above an open traffic lane on limited access facilities, when called for in the plans or approved by the Engineer.

102-8 Driveway Maintenance.

102-8.1 General: Ensure that each residence and or business has safe, stable, and reasonable access.

102-8.2 Construction Methods: Place, level, manipulate, compact, and maintain the material, to the extent appropriate for the intended use.

As permanent driveway construction is accomplished at a particular location, the Contractor may salvage and reuse previously placed materials that are suitable for reuse on other driveways.

102-9 Temporary Traffic Control Devices.

102-9.1 Installation and Maintenance: Install and maintain temporary traffic control devices as detailed in the plans, Index 600 of the Design Standards and when applicable, in accordance with the approved vendor drawings, as provided on the Qualified Products List

(QPL) or the Approved Products List (APL). Erect the required temporary traffic control devices to prevent any hazardous conditions and in conjunction with any necessary traffic re-routing to protect the traveling public, workers, and to safeguard the work area. Use only those devices that are on the QPL or the APL. Immediately remove or cover any devices that do not apply to existing conditions.

All temporary traffic control devices must meet the requirements of National Cooperative Highway Research Program Report 350 (NCHRP 350) or the Manual for Assessing Safety Hardware 2009 (MASH) and current FHWA directives. Manufacturers seeking evaluation must furnish certified test reports showing that their product meets all test requirements set forth by NCHRP 350 or the MASH. Manufacturers seeking evaluation of Category I devices for inclusion on the QPL shall include the manufacturer's self-certification letter. Manufacturer's seeking evaluation of Category II and Category III devices for inclusion on the QPL shall include the FHWA WZ numbered acceptance letter with attachments and vendor drawings of the device in sufficient detail to enable the Engineer to distinguish between this and similar devices. For devices requiring field assembly or special site preparation, vendor drawings shall include all field assembly details and technical information necessary for proper application and installation and must be signed and sealed by a Professional Engineer registered in the State of Florida. Manufacturers seeking evaluation of Category IV devices for inclusion on the QPL or APL must comply with the requirements of Section 990 and include detailed vendor drawings of the device along with technical information necessary for proper application, field assembly and installation.

Ensure that the QPL or APL number is permanently marked on the device at a readily visible location. Sheeting used on devices is exempt from this marking requirement.

Notify the Engineer of any scheduled operation which will affect traffic patterns or safety sufficiently in advance of commencing such operation to permit his review of the plan for the proposed installation of temporary traffic control devices.

Ensure an employee is assigned the responsibility of maintaining the position and condition of all temporary traffic control devices throughout the duration of the Contract. Keep the Engineer advised at all times of the identification and means of contacting this employee on a 24-hour basis.

Keep temporary traffic control devices in the correct position, properly directed, clearly visible and clean, at all times. Ensure that all traffic control devices meet acceptable standards as outlined in American Traffic Safety Services Association (ATSSA's) "Quality Guidelines for Temporary Traffic Control Devices and Features". Immediately repair, replace or clean damaged, defaced or dirty devices.

102-9.2 Work Zone Signs: Provide signs in accordance with the plans and Design Standards. Meet the requirements of 700-2.5 and 990-8.. Use only approved systems, which includes sign support posts or stands and attachment hardware (nuts, bolts, clamps, brackets, braces, etc.), meeting the vendor requirements specified on the QPL Drawings.

Attach the sign to the sign support using hardware meeting the manufacturer's recommendations and as specified in the Design Standards.

Provide Federal Highway Administration's (FHWA) accepted sign substrate for use with accepted sign stands on the National Highway System (NHS) under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

102-9.3 Business Signs: Provide and place signs in accordance with the plans and Design Standards. Furnish signs having retroreflective sheeting meeting the requirements of Section 990.

Use signs with specific business names on each sign. Install logos provided by business owners and approved by the Engineer. Standard Business entrance signs meeting the requirements of Index 17355 without specific business names may be used only with the approval of the Engineer.

102-9.4 High Intensity Flashing Lights: Furnish Type B lights in accordance with the plans and Design Standards.

102-9.5 Warning/Channelizing Devices: Furnish warning/channelizing devices in accordance with the plans and Design Standards.

102-9.5.1 Retroreflective Collars for Traffic Cones: Use collars for traffic cones listed on the QPL that meet the requirements of Section 990. Use cone collars at night designed to properly fit the taper of the cone when installed. Place the upper 6 inches collar a uniform 3 1/2 inch distance from the top of the cone and the lower 4 inch collar a uniform 2 inch distance below the bottom of the upper 6 inch collar. Ensure that the collars are capable of being removed for temporary use or attached permanently to the cone in accordance with the manufacturer's recommendations. Provide a white sheeting having a smooth outer surface and that has the property of a retroreflector over its entire surface.

102-9.5.2 Barrier Wall (Temporary): Furnish, install, maintain, remove and relocate a temporary barrier wall in accordance with the plans. Ensure that temporary concrete barrier wall for use on roadway sections, complies with Index No. 412, 415 or 414 as specified in the plans. Ensure that temporary concrete barrier wall for use on bridge and wall sections, complies with Index No. 414 as specified in the plans. Ensure that temporary water filled barrier wall used on roadway sections meets the NCHRP Report 350 criteria or the MASH and is listed on the Qualified Products List (QPL). Barriers meeting the requirements of Index No. 412, 415 or temporary water filled barriers on the QPL will not be accepted as an alternate to barriers meeting the requirements of Index No. 414.

102-9.5.3 Glare Screen (Temporary): Use temporary glare screens listed on the QPL that meet the requirements of Section 990. Furnish, install, maintain, remove and relocate glare screen systems in conjunction with temporary barrier wall at locations identified in the plans.

Ensure the anchorage of the glare screen to the barrier is capable of safely resisting an equivalent tensile load of 600 lb/ft of glare screen, with a requirement to use a minimum of three fasteners per barrier section.

When glare screen is utilized on temporary barrier wall, warning lights will not be required.

102-9.6 Temporary Crash Cushion (Redirect/Inertia): Furnish, install, maintain and subsequently remove temporary crash cushions in accordance with the details and notes shown in the plans, the Design Standards, and requirements of the pre-approved alternatives listed on the QPL. Maintain the crash cushions until their authorized removal. Repair all attachment scars to permanent structures and pavements after crash cushion removal. Make necessary repairs due to defective material, work, or Contractor operations at no cost to the Department. Restore crash cushions damaged by the traveling public within 24 hours after notification as authorized by the Engineer.

102-9.7 Guardrail (Temporary): Furnish guardrail (temporary) in accordance with the plans and Design Standards. Meet the requirements of Section 536.

102-9.8 Advance Warning Arrow Panel: Furnish advance warning arrow panels that meet the requirements of Section 990 as required by the plans and Design Standards to advise approaching traffic of lane closures or shoulder work.

102-9.9 Portable Changeable Message Sign (PCMS): Furnish portable changeable message signs that meet the requirements of Section 990 as required by the plans and Design Standards to supplement other temporary traffic control devices used in work zones.

A truck mounted PCMS may be used as a stand alone maintenance of traffic device only when used for accident or incident management situations as defined in the MUTCD and is listed on the APL.

102-9.10 Portable Regulatory Signs (PRS): Furnish portable regulatory signs that meet the requirements of 990 as required by the plans and Design Standards.

Activate portable regulatory signs only during active work activities and deactivate when no work is being performed.

102-9.11 Radar Speed Display Unit (RSDU): Furnish radar speed display units that meet the requirements of Section 990 as required by the plans and Design Standards to inform motorists of the posted speed and their actual speed.

Activate the radar speed display unit only during active work activities and deactivate when no work is being performed.

102-9.12 Temporary Traffic Control Signals: Furnish, install and operate temporary traffic control signals as indicated in the plans. Temporary traffic control signals will consist of either portable or fixed traffic signals.

Provide portable traffic signals that meet the requirements of the Design Standards, 603-2 and are listed on the APL. The Engineer may approve used signal equipment if it is in acceptable condition.

102-9.13 Temporary Traffic Detection Technology: Furnish, install and operate Temporary Traffic Detection Technology listed on the Department's APL and approved by the Engineer to restore detection capabilities.

102-9.14 Truck Mounted Attenuators and Trailer Mounted Attenuators: Furnish, install and maintain only those attenuators that meet the requirements of NCHRP 350 or the MASH.

Use Truck Mounted Attenuators or Trailer Mounted Attenuators, when called for in the Design Standards. Use attenuators listed on the QPL.

When attenuators are called for, use either a truck mounted attenuator or a trailer mounted attenuator system designed and installed in accordance with the manufacturers recommendations.

Equip the attenuator cartridge with lights and reflectors in compliance with applicable Florida motor vehicle laws, including turn signals, dual tail lights, and brake lights. Ensure that lights are visible in both the raised and lowered positions if the unit is capable of being raised.

Ensure that the complete unit is painted DOT yellow (Fed. Std. 595 b, No. 13538). Stripe the rear facing of the cartridge in the operating position with the alternating 6 inch white and 6 inch safety orange 45 degree striping to form an inverted "V" at the center of the unit and slope down and toward the outside of the unit, in both directions from the center. In the raised position, place at least the same square footage of striping on the bottom of the

cartridge as placed on the rear facing cartridge in the open position. Use Type III retroreflectorized sheeting for striping.

Attenuators will not be paid for separately. Include the cost of the truck with either a truck mounted attenuator or a trailer mounted attenuator in Maintenance of Traffic Lump Sum. Payment includes all costs, including furnishing, maintaining and removal when no longer required, and all materials, labor, tools, equipment and incidentals required for attenuator maintenance.

102-9.15 Temporary Raised Rumble Strip Sets: When called for in the plans, furnish, install, maintain, remove, and reinstall temporary raised rumble strip sets.

Install the temporary raised rumble strip sets per the manufacturer's recommendations and in accordance with Index 600.

The temporary raised rumble strip may be either a removable polymer striping tape or a molded engineered polymer material.

102-9.16 Automated Flagger Assistance Devices (AFAD): Furnish, install, maintain, remove and relocate AFADs in accordance with the plans and Design Standards. Position AFADs where they are clearly visible to oncoming traffic and out of the lane of traffic. The devices may be operated either by a single flagger at one end of the traffic control zone, from a central location, or by a separate flagger near each device's location.

AFADs may be either a remotely controlled Stop/Slow AFAD mounted on either a trailer or a movable cart system, or a remotely controlled Red/Yellow Lens AFAD.

AFADs will not be paid for separately. AFADs may be used as a supplement or an alternate to flaggers in accordance with Index 603. Include the cost for AFADs in Maintenance of Traffic Lump Sum.

102-10 Work Zone Pavement Marking.

102-10.1 Description: Furnish and install Work Zone Pavement Markings for maintenance of traffic in construction areas and in close conformity with the lines and details shown in the plans and Design Standards.

Centerlines, lane lines, edge lines, stop bars and turn arrows will be required in work zones prior to opening the road to traffic.

The most common types of Work Zone Pavement Markings are painted pavement markings and removable tape. Other types of Work Zone Pavement Markings may be identified in the plans.

102.10.2 Painted Pavement Markings:

102-10.2.1 General: Use painted pavement markings meeting the requirements of Section 710. Use standard waterborne paint unless otherwise identified in the plans or approved by the Engineer.

102-10.3 Removable Tape:

102-10.3.1 General: Use removable tape listed on the QPL and meeting the requirements of 990-4.

102-10.3.2 Application: Apply removable tape with a mechanical applicator to provide pavement lines that are neat, accurate and uniform. Equip the mechanical applicator with a film cut-off device and with measuring devices that automatically and accumulatively measure the length of each line placed within an accuracy tolerance of $\pm 2\%$. Ensure removable tape adheres to the road surface. Removable tape may be placed by hand on short sections 500 feet or less if it is done in a neat accurate manner.

102-10.3.3 Retroreflectivity: Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than 300 mcd/lx·m² for white and contrast markings and not less than 250 mcd/lx·m² for yellow markings. Black portions of contrast tapes and black masking tapes must be non-reflective and have a reflectance of less than 5 mcd/lx m². At the end of the six month service life, the retroreflectance of white and yellow removable tape shall not be less than 150 mcd/lx·m².

102-10.3.4 Removability: Provide removable tape capable of being removed from bituminous concrete and portland cement concrete pavement intact or in substantially large strips, either manually or by a mechanical roll-up device, at temperatures above 40°F, without the use of heat, solvents, grinding or blasting.

102-10.4 Temporary Retroreflective Pavement Markers (RPM's): Use markers listed on the QPL and meeting the requirements of 990-5. Apply all markers in accordance with the Design Standards, Index No. 600, prior to opening the road to traffic. Replace markers any time after installation when more than three consecutive markers fail or are missing, at no expense to the Department, in a timely manner, as directed by the Engineer.

102-11 Method of Measurement.

102-11.1 General: Devices installed/used on the project on any calendar day or portion thereof, within the allowable Contract Time, including time extensions which may be granted, will be paid for at the Contract unit price for the applicable pay item, except those paid for as Lump Sum.

102-11.2 Traffic Control Officers: The quantity to be paid for will be at the Contract unit price per hour (4 hour minimum) for the actual number of officers certified to be on the project site, including any law enforcement vehicle(s) and all other direct and indirect costs. Payment will be made only for those traffic control officers specified in the Plans and authorized by the Engineer.

102-11.3 Special Detours: When a detour facility is specifically detailed in the plans, or is otherwise described or detailed as a special item, and an item for separate payment is included in the proposal, the work of constructing, maintaining, and subsequently removing such detour facilities will be paid for separately. Traffic control devices, warning devices, barriers, signing, and pavement markings for Special Detours will also be paid for separately.

When the plans show more than one detour, each detour will be paid for separately, at the Contract lump sum price for each.

Where a separate item for a specific detour facility is included in the proposal, payment will be made under Special Detour.

102-11.4 Commercial Material for Driveway Maintenance: The quantity to be paid for will be the certified volume, in cubic yards, of all materials authorized by the Engineer, acceptably placed and maintained for driveway maintenance. The volume, which is authorized to be reused, and which is acceptably salvaged, placed, and maintained in other designated driveways will be included again for payment.

102-11.5 Work Zone Signs: The number of temporary post-mounted signs (Temporary Regulatory, Warning and Guide) certified as installed/used on the project will be paid for at the Contract unit price for Work Zone Signs. When multiple signs are located on single or multiple post(s), each sign panel will be paid individually. Signs greater than 20 ft² and detailed in the plans will be paid for under Lump Sum MOT.

Temporary portable signs (excluding Mesh signs) and Vehicular Mounted Signs will be included for payment under work zone signs, only if used in accordance with the Design Standards.

102-11.6. Business Signs: The number of business signs certified as installed/used on the project will be paid for at the Contract unit price for Business Signs.

102-11.7 High Intensity Flashing Lights: The number of high intensity flashing lights (Type B) certified as installed/used on the project will be paid for at the Contract unit price for High Intensity Flashing Lights (Temporary - Type B).

102-11.8 Channelizing Devices: The number of Type I, Type II, Direction Indicator Barricade, Type III, Vertical Panel and Drum Channelizing Devices certified as installed/used on the project meeting the requirements of Design Standards, Index No. 600 and have been properly maintained will be paid for at the Contract unit prices for Barricade (Temporary). Payment will be made for each channelizing device that is used to delineate trailer mounted devices. Payment will be made for channelizing devices delineating portable changeable message signs during the period beginning fourteen working days before Contract Time begins as authorized by the Engineer.

102-11.9 Barrier Wall (Temporary): The Contract unit price for Barrier Wall (Temporary) will be full compensation for furnishing, installing, maintaining, and removing the barrier wall. When called for, the Contract unit price for Barrier Wall (Temporary/Relocate) will be full compensation for relocating the barrier. The certified quantity to be paid for will be determined by the number of sections times the nominal length of each section.

102-11.10 Lights, Temporary, Barrier Wall Mount: The number of Type C Steady Burn lights, mounted on barrier wall, certified as installed/used on the project, meeting the requirements of the Design Standards and have been properly maintained will be paid for at the Contract unit price for Lights Temporary, Barrier Wall Mount.

102-11.11 Glare Screen (Temporary): The certified quantity to be paid for will be determined by the number of sections times the nominal length of each section.

102-11.12 Temporary Crash Cushions:

102-11.12.1 Redirective: The quantity to be paid for will be the number of Temporary Crash Cushions (Redirective) certified as installed/used and maintained on the project, including object marker.

102-11.12.2 Inertia: The quantity to be paid for will be the number of Temporary Crash Cushions (Inertia) complete arrays certified as installed/used and maintained in accordance with the plans and Design Standards, Index No. 417.

102-11.13 Temporary Guardrail: The quantity to be paid for will be the length, in feet, of temporary guardrail constructed and certified as installed/used on the project. The length of a run of guardrail will be determined as a multiple of the nominal panel lengths.

102-11.14 Advance Warning Arrow Panel: The quantity to be paid at the contract unit price will be for the number of advance warning arrow panels certified as installed/used on the project on any calendar day or portion thereof within the contract time.

102-11.15 Portable Changeable Message Sign: The quantity to be paid at the contract unit price will be for the number of portable changeable message signs certified as installed/used on the project on any calendar day or portion thereof within the contract time. Payment will be made for each portable changeable message sign that is used during the period beginning fourteen working days before Contract Time begins as authorized by the Engineer.

102-11.16 Portable Regulatory Signs: The quantity to be paid for will be the number of portable regulatory signs certified as installed/used on the project on any calendar day or portion thereof within the contract time, will be paid for the contract unit price for portable regulatory sign.

102-11.17 Radar Speed Display Unit: The quantity to be paid for will be the number of radar speed display units certified as installed/used on the project on any calendar day or portion thereof within the contract time, will be paid for the contract unit price for radar speed display unit.

102-11.18 Temporary Traffic Control Signals: The quantity of Temporary Traffic Control Signals to be paid for will be the number of completed installations (each signalized location) of portable traffic signals, or the number of fixed traffic signals in place and operating on the project, as authorized by the Engineer and certified as in place and in operation on the project.

102-11.19 Temporary Traffic Detection Technology: The quantity of Temporary Traffic Detection Technology to be paid for will be the number of completed and accepted intersections utilizing Temporary Traffic Detection Technology, authorized by the Engineer and certified as completed on the project. Compensation will begin the day Temporary Traffic Detection Technology is placed into operation and approved by the Engineer and will end the day the permanent detection is operational and approved by the Engineer.

102-11.20 Work Zone Pavement Markings: The quantities, furnished and installed, to be paid for will be the length of skip and solid pavement markings, and the area of pavement markings placed as follows:

(a) The total transverse distance, in feet, of skip pavement marking authorized and acceptably applied. The length of actual applied line will depend on the skip ratio of the material used. Measurement will be the distance from the beginning of the first stripe to the end of the last stripe with proper deductions made for unpainted intervals as determined by plan dimensions or stations, subject to 9-1.3.

(b) The net length, in feet, of solid pavement marking authorized and acceptably applied.

(c) The number of directional arrows or pavement messages authorized and acceptably applied.

(d) The number of Temporary RPM's authorized and acceptably applied.

102-11.21 Temporary Raised Rumble Strips: The quantity of temporary raised rumble strip sets to be paid for will be the number of temporary raised rumble strip sets installed and accepted.

102-12 Submittals.

102-12.1 Submittal Instructions: Prepare a certification of quantities, using the Department's current approved form, for certified Maintenance of Traffic payment items for each project in the Contract. Submit the certification of quantities to the Engineer. The Department will not pay for any disputed items until the Engineer approves the certification of quantities.

102-12.2 Contractor's Certification of Quantities: Request payment by submitting a certification of quantities no later than Twelve O'clock noon Monday after the estimate cut-off date or as directed by the Engineer, based on the amount of work done or completed. Ensure the certification consists of the following:

(a) Contract Number, FPID Number, Certification Number, Certification Date and the period that the certification represents.

(b) The basis for arriving at the amount of the progress certification, less payments previously made and less an amount previously retained or withheld. The basis will include a detail breakdown provided on the certification of items of payment in accordance with 102-13. After the initial setup of the maintenance of traffic items and counts, the interval for recording the counts will be made weekly on the certification sheet unless there is a change. This change will be documented on the day of occurrence. Some items may necessitate a daily interval of recording the counts.

102-13 Basis of Payment.

102-13.1 Maintenance of Traffic (General Work): When an item of work is included in the proposal, price and payment will be full compensation for all work and costs specified under this Section except as may be specifically covered for payment under other items.

102-13.2 Traffic Control Officers: Price and payment will be full compensation for the services of the traffic control officers.

102-13.3 Special Detours: Price and payment will be full compensation for providing all detour facilities shown on the plans and all costs incurred in carrying out all requirements of this Section for general maintenance of traffic within the limits of the detour, as shown on the plans.

102-13.4 Commercial Materials for Driveway Maintenance: Price and payment will be full compensation for all work and materials specified for this item, including specifically all required shaping and maintaining of driveways.

102-13.5 Work Zone Signs: Price and payment will be full compensation for all work and materials for furnishing signs, supports and necessary hardware, installation, relocating, maintaining and removing signs.

102-13.6. Business Signs: Price and payment will be full compensation for all materials and labor required for furnishing, installing, relocating, maintaining, and removing the signs as well as the cost of installing any logos provided by business owners.

102-13.7 High Intensity Warning Lights: Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing high intensity flashing lights (Type B).

102-13.8 Channelizing Devices: Prices and payment will be full compensation for furnishing, installing, relocating, maintaining and removing the channelizing devices, including the costs associated with attached warning lights as required.

102-13.9 Barrier Wall (Temporary): Price and payment will be full compensation for furnishing, installing, maintaining, and removing the barrier. When called for, Barrier Wall (Temporary) (Relocate) will be full compensation for relocating the barrier.

102-13.10 Lights, Temporary, Barrier Wall Mount: Price and payment will be full compensation for all work and materials for furnishing, installing and maintaining the warning lights mounted on barrier wall. Payment will not be made for lights that are improperly placed or are not working.

102-13.11 Glare Screen (Temporary): Price and payment will be full compensation for furnishing, installing, maintaining, and removing the glare screen certified as installed/used on the project. When called for, Glare Screen (Relocate) will be full compensation for relocating the glare screen.

102-13.12 Temporary Crash Cushion:

102-13.12.1 Redirective: Price and payment will be full compensation for furnishing, installing, maintaining (including restoring or replacing damaged) and subsequently removing such crash cushions.

102-13.12.2 Inertia: Price and payment for the number of complete arrays will be full compensation for furnishing, installing, maintenance and removal at each specified location. In addition, payment will be made for new modules replaced due to damages, excluding damage caused by the Contractor's operations.

102-13.13 Temporary Guardrail: Price and payment will be full compensation for furnishing all materials required for a complete installation, including end anchorage assemblies and any end connections to other structures and for installing, maintaining and removing guardrail.

102-13.14 Advance Warning Arrow Panel: Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing advance warning arrow panels.

102-13.15 Portable Changeable Message Sign: Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing portable changeable message signs.

102-13.16 Portable Regulatory Signs: Price and payment will be full compensation for furnishing, installing, relocating, maintaining and removing a completely functioning system as described in these specifications portable regulatory signs. Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing portable regulatory signs.

Payment will include all labor, materials, incidentals, repairs and any actions necessary to operate and maintain the unit at all times that work is being performed or traffic is being affected by construction and/or maintenance of traffic operations.

102-13.17 Radar Speed Display Unit: Price and payment will be made only for a completely functioning system as described in these specifications. Payment will include all labor, hardware, accessories, signs, and incidental items necessary for a complete system. Payment will include any measurements needed to insure that the unit conforms to all specification requirements.

Payment will include all labor, materials, incidentals, repairs and any actions necessary to operate and maintain the unit at all times that work is being performed or traffic is being affected by construction and/or maintenance of traffic operations. Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing radar speed display unit.

102-13.18 Temporary Traffic Control Signals: Price and payment will constitute full compensation for furnishing, installing, operating, maintaining and removing temporary traffic control signals including all equipment and components necessary to provide an operable traffic signal.

102-13.19 Temporary Traffic Detection Technology: Price and payment of per intersection/per day will constitute full compensation for furnishing, installing, operating, maintaining and removing temporary traffic detection technology including all equipment and components necessary to provide an acceptable signalized intersection. Take ownership of all equipment and components.

102-13.20 Temporary Raised Rumble Strips: Price and payment will be full compensation for all work and materials described in this Section, including all cleaning and

preparing of surfaces, disposal of all debris, furnishing of all materials, application, curing, removal, reinstalling and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work.

102-13.21 Work Zone Pavement Markings: Price and payment will be full compensation for all work specified including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

Removable Tape may be substituted for work zone paint at no additional cost to the Department.

Payment for Temporary Retroreflective Pavement Markers used to supplement line markings will be paid for under Temporary Retroreflective Pavement Markers. Install these markers as detailed in the Design Standards.

102-13.22 Payment Items: Payment will be made under:

Item No. 102- 1-	Maintenance of Traffic - lump sum.
Item No. 102- 2-	Special Detour - lump sum.
Item No. 102- 3-	Commercial Material for Driveway Maintenance - per cubic yard.
Item No. 102- 14-	Traffic Control Officer - per hour.
Item No. 102- 60-	Work Zone Sign - per each per day.
Item No. 102- 61-	Business Sign - each.
Item No. 102- 71-	Barrier Wall - per foot.
Item No. 102- 94-	Glare Screen - per foot.
Item No. 102- 73-	Guardrail (Temporary) - per foot.
Item No. 102- 74-	Barricade (Temporary) - per each per day.
Item No. 102- 76-	Advanced Warning Arrow Panel - per each per day.
Item No. 102- 77-	High Intensity Flashing Lights (Temporary - Type B) - per each per day.
Item No. 102- 78-	Temporary Retroreflective Pavement Markers - each.
Item No. 102- 79-	Lights, Temporary, Barrier Wall Mount - per each per day.
Item No. 102- 81-	Crash Cushion (Gating) (Temporary) -per location.
Item No. 102- 89-	Crash Cushion (Temporary) - per location.
Item No. 102- 99-	Portable Changeable Message Sign (Temporary) - per each per day.
Item No. 102-104-	Temporary Traffic Control Signals (Portable) - per each per day.
Item No. 102-104-	Temporary Traffic Control Signals (Fixed) - per each per day.
Item No. 102-107-	Temporary Traffic Detection - per day.
Item No. 102-150-	Portable Regulatory Sign - per each per day.
Item No. 102-150-	Radar Speed Display Unit - per each per day.
Item No. 102-910-	Temporary Raised Rumble Strip Set – per set
Item No. 102-911-	Removable Tape (White/Black) - per foot.
Item No. 102-912-	Removable Tape (Yellow) - per foot.
Item No. 710-	Painted Pavement Markings.
Item No. 711-	Thermoplastic Traffic Stripes and Markings.

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

(REV 6-22-10) (FA 7-29-10) (1-11)

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 square feet 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 Department. 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 Design Standards 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):

104-6.4.9.1 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 Department. 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 Department 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.

104-6.6 Signed and Sealed As-Built Drawings: Prior to final acceptance of the project, submit to the Engineer three copies of as-built drawings and a certified survey verifying the as-built conditions for all installed and constructed surface water management systems. The as-built drawings and certified survey must satisfy all the requirements and special conditions listed in the Water Management District's Environmental Resource Permit (ERP) and any applicable local permit. The as-built drawings and certified survey must be signed and sealed by an appropriately licensed professional registered in the State of Florida.

If the ERP does not contain specific requirements, provide as-built drawings with the following information as a minimum:

1. Discharge structures: structure identification number, type, locations (latitude and longitude), dimensions and elevations of all, including weirs, bleeders, orifices, gates, pumps, pipes, and oil and grease skimmers.
2. Side bank and underdrain filters, or exfiltration trenches: locations, dimensions and elevations of all, including clean-outs, pipes, connections to control structures and points of discharge to receiving waters.
3. Storage areas for treatment and attenuation: storage area identification number, dimensions, elevations, contours or cross-sections of all, sufficient to determine stage-storage relationships of the storage area and the permanent pool depth and volume below the control elevation for normally wet systems.
4. System grading: dimensions, elevations, contours, final grades or cross-sections to determine contributing drainage areas, flow directions and conveyance of runoff to the system discharge points.
5. Conveyance: dimensions, elevations, contours, final grades or cross-sections of systems utilized to divert off-site runoff around or through the new system.
6. Water levels: existing water elevations and the date determined.
7. Benchmarks: location and description (minimum of one per major water control structure).

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 Department, 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 Department. If reconstruction of permanent or temporary erosion and sediment control features is necessary due

to factors beyond the control of the Contractor, the Department 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.

104-8 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 length, in feet, of Runoff Control Structures, measured along the surface of the work constructed; (3) the number of Sediment Containment Systems constructed and accepted; (4) the number of Sediment Containment System Cleanouts accomplished and accepted; (5) the length, in feet, of Sediment Barriers; (6) the length, in feet, of Floating Turbidity Barrier; (7) the length, in feet, of Staked Turbidity Barrier; (8) the number of inlet protection systems; (9) the area, in square yards, of chemical treatment; (10) 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.

Any additional costs resulting from compliance with the requirements of this Section, other than construction, routine maintenance, and removal of temporary erosion control features, 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 Department'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- 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 5-24-10) (FA 8-16-10) (1-11)

SUBARTICLE 105-3.1 (Pages 137 – 138) is deleted and the following substituted:

105-3.1 General: Certain operations require personnel with specific qualifications. Certain materials require production under an approved Quality Control (QC) Plan to ensure that these materials meet the requirements of the Contract Documents. Applicable materials include hot mix asphalt, Portland cement concrete (Structural), earthwork, cementitious materials, timber, steel and miscellaneous metals, galvanized metal products, prestressed and/or precast concrete products and drainage products. For all applicable materials included in the Contract, submit a QC Plan prepared in accordance with the requirements of this Section to the Engineer. Do not incorporate any of these materials into the project prior to the Engineer's approval of the QC Plan.

Steel and Miscellaneous Metal products, including aluminum, are defined as the metal components of bridges, including pedestrian and moveable bridges, overhead and cantilevered sign supports, ladders and platforms, bearings, end wall grates, roadway gratings, drainage items, expansion joints, roadway decking, shear connectors, handrails, galvanized products, fencing, guardrail, light poles, high mast light poles, standard mast arm assemblies and Monotube assemblies, stay in-place forms, casing pipe, strain poles, fasteners, connectors and other hardware.

When accreditation or certification is required, make supporting documents from the two previous inspections performed by the accrediting or certifying agency available to the Department upon request.

Obtain Department approval prior to beginning production. Meet and maintain the approved Quality Control Program requirements at all times. Production and construction of these products without the Department's prior approval of a Quality Control Program may result in rejection of the products. Continued approval will be subject to satisfactory results from Department evaluations, including the Independent Assurance program. In cases of non-compliance with the approved Quality Control Program, identify all affected material and do not incorporate or supply to the Department projects. The following conditions may result in suspension of a Quality Control Program:

- a. Failure to timely supply information required.
- b. Repeated failure of material to meet Standard Specification requirements.
- c. Failure to take immediate corrective action relative to deficiencies in the performance of the Quality Control Program.
- d. Certifying materials that are not produced under an approved Quality Control Program for use on Department projects.
- e. Failure to correct any deficiencies related to any requirement of the Quality Control Program, having received notice from the Department, within the amount of time defined in the notice.

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 Department'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 Department's Materials Manual, which may be viewed at the following URL:
www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/section62.pdf .

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

Producers of Precast/Prestressed Concrete Products shall meet the requirements of Sections 8.1 and 8.3 of the Department's Materials Manual, which may be viewed at the following URLs:
www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/section81.pdf .
<http://www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/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 Department's Materials Manual, which may be viewed at the following URL:
www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/section84.pdf

Producers of Incidental Precast/Prestressed Concrete Products shall meet the requirements of Section 8.2, Volume II of the Department's Materials Manual, which may be viewed at the following URL:
www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/section82.pdf .

Producers of Portland Cement Concrete shall meet the requirements of Section

9.2, Volume II of the Department's Materials Manual, which may be viewed at the following URL:

www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/section92.pdf.

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

www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/section111.pdf.

www.dot.state.fl.us/specificationsoffice/Implemented/URLinSpecs/Files/section112.pdf.

SUBARTICLE 105-5.2.1 (Page 140) is deleted and the following substituted:

105-5.2.1 Qualifications: Submit the Training Identification Numbers (TINs) or any other information which will be traceable to the certification agency's training location and dates for all technicians performing sampling, testing and inspection for both field and laboratory tests. Provide the names of the CTQP certifications and other pertinent certifications held and the expiration dates for each certification for each technician. Include employed and subcontracted technicians.

ARTICLE 105-6 (Page 142) is deleted and the following substituted:

105-6 Lab Qualification Program.

Testing Laboratories participating in the Department's Acceptance Program must have current Department qualification when testing materials that are used on Department projects. In addition, they must have one of the following:

- a. Current AASHTO (AAP) accreditation.
- b. Inspected on a regular basis per ASTM D 3740 for earthwork, ASTM D 3666 for asphalt and ASTM C 1077 for concrete for test methods used in the Acceptance Program, with all deficiencies corrected, and under the supervision of a Specialty Engineer.
- c. Current Construction Materials Engineering Council (CMEC) program accreditation or other independent inspection program accreditation acceptable to the Engineer and equivalent to a. or b. above.

After meeting the criteria described above, submit a Laboratory Qualification Application to the Department. The application is available from the Department's website. Obtain the Department's qualification prior to beginning testing. The Department may inspect the laboratory for compliance with the accreditation requirements prior to issuing qualification.

Meet and maintain the qualification requirements at all times. Testing without Department's qualification may result in a rejection of the test results. Continued qualifications are subject to satisfactory results from Department evaluations, including Independent Assurance evaluations. In case of suspension or disqualification, prior to resumption of testing, resolve the issues to the Department's satisfaction and obtain reinstatement of qualification. The following conditions may result in suspension of a laboratory's qualified status:

- a. Failure to timely supply required information.
- b. Loss of accredited status.
- c. Failure to correct deficiencies in a timely manner.
- d. Unsatisfactory performance.

e. Changing the laboratory's physical location without notification to the accrediting agency and the Engineer.

f. Delays in reporting the test data in the Department's database.

g. Incomplete or inaccurate reporting.

h. Using unqualified technicians performing testing.

Should any qualified laboratory falsify records, the laboratory qualification will be subject to revocation by the Engineer. Falsification of project-related documentation will be subject to further investigation and penalty under state and federal laws.

It is prohibited for any contract laboratory or staff to perform Contractor Quality Control testing and any other Acceptance Program testing on the same contract.

SUBARTICLE 105-8.6.1 (Page 144) is deleted and the following substituted:

105-8.6.1 Plant Technicians: For asphalt plant operations, provide a QC technician, qualified as a CTQP Asphalt Plant Level II technician, available at the asphalt plant at all times when producing mix for the Department. Perform all asphalt plant related testing with a CTQP Asphalt Plant Level I technician.

SUBARTICLE 105-8.6.2 (Page 144) is deleted and the following substituted:

105-8.6.2 Paving Technicians: For paving operations, keep a qualified CTQP Asphalt Paving Level II technician on the roadway at all times when placing asphalt mix for the Department, and perform all testing with a CTQP Asphalt Paving Level I technician. As an exception, measurements of cross-slope, temperature and yield (spread rate), as well as the inspection of the placement of miscellaneous asphalt, can be performed by someone under the supervision of a CTQP Paving Level II technician.

Subarticle 105-8.7 (Pages 144-145) is deleted and the following substituted:

105-8.7 Concrete QC Personnel:

105-8.7.1 Concrete Field Technician - Level I: Ensure technicians performing plastic property testing on concrete for materials acceptance are qualified CTQP Concrete Field Technicians Level I. Plastic property testing will include but not be limited to slump, temperature, air content, water-to-cementitious materials ratio calculation, and making and curing concrete cylinders. Duties will include initial sampling and testing to confirm specification compliance prior to beginning concrete placements, ensuring timely placement of initial cure and providing for the transport of compressive strength samples to the designated laboratories.

105-8.7.2 Concrete Field Inspector - Level II: Ensure field inspectors responsible for the quality of concrete being placed on major bridge projects are qualified CTQP Concrete Field Inspectors Level II. A Level II Inspector must be present on the jobsite during all concrete placements. Prior to the placement of concrete, the inspector will inspect the element to be cast to ensure compliance with Contract Documents. A Level II Inspector's duties may include ensuring that concrete testing, inspection, and curing in the field are performed in

accordance with the Contract Documents. The QC Inspector will inform the Verification Inspector of anticipated concrete placements and LOT sizes.

105-8.7.3 Concrete Laboratory Technician:

105-8.7.3.1 Concrete Laboratory Technician - Level I: Ensure technicians testing cylinders and recording concrete strength for material acceptance are qualified CTQP Concrete Laboratory Technicians Level I. Duties include final curing, compressive strength testing, and the recording/reporting of all test data.

105-8.7.3.2 Concrete Laboratory Technician – Level II: Ensure that laboratories providing hardened property test results to the Department are under the supervision of a CTQP Concrete Laboratory Technician - Level II. This person is responsible to ensure that the tests are performed in accordance with Standard Test Methods, project specifications and other contract documents.

105-8.7.4 Concrete Production Facility Manager for Quality Control: Ensure each concrete production facility has a Facility Manager for QC with the following qualifications:

1. CTQP Concrete Laboratory Technician Level I, CTQP Concrete Field Technician-Level I, and CTQP Batch Plant Operator. As alternatives to these qualifications, the Department will accept the following qualifications:

- a. Prestressed Concrete Institute (PCI) Level III certification,
- b. National Ready Mixed Concrete Association (NRMCA)

Concrete Technologist Level II, or

c. Precast Concrete Pipe, Box Culverts, Drainage Structures or Incidental Precast Concrete Plants Level II Quality Control Inspector Certifications meeting the requirements of 105-8.11.

2. Three years of QC experience directly related to cement concrete production.

3. Demonstrated proficiency in implementing, supervising, and maintaining surveillance over a QC Program.

4. Experience and certification in performance of required QC tests and statistical evaluation of QC test results.

105-8.7.5 Concrete Mix Designer: Ensure all mix designs are developed by individuals who are qualified under one of the following:

1. CTQP Concrete Lab Technician Level II;
2. National Ready Mix Concrete Association Level 2 Production Control Technician Certification;

3. Precast Concrete Pipe, Box Culverts, Drainage Structures, and Incidental Precast Concrete Level II Quality Control Inspector meeting the requirements of 105-8.11; or

4. PCI Quality Control Level III certification.

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.

SUBARTICLE 105-8.11 (Pages 150 – 151) is deleted and the following substituted:

105-8.11 Pipe and Precast Concrete Products Manufacturing Facilities Quality Control Personnel:

105-8.11.1 General: Obtain personnel certifications from Department accredited training providers. The list of Department approved courses and their accredited providers is available on the State Materials Office website.

105-8.11.2 Precast Concrete Drainage Structures, Precast Concrete Box Culvert, Precast Concrete Pipe, Incidental Precast Concrete, and Flexible Pipe Manufacturing Facilities Quality Control Personnel:

105-8.11.2.1 Level I Quality Control Inspectors: Ensure that the Level I Inspectors have completed a minimum of a 12-hour, Department approved, Level I QC Inspector training course in the respective work area. As an exception to this, ensure Flexible Pipe Level I QC Inspectors have completed a minimum of an 8-hour, Department approved, Level I QC Flexible Pipe Inspector training course. For Incidental Precast Concrete, as an alternative to the completion of the 12-hour training course, the Department will accept QC personnel meeting the requirements of 105-8.11.2.4.1 and CTQP Concrete Field Technician level I certification or Precast/Prestressed Concrete Institute (PCI) Quality Control Technician/Inspector Level II certification.

105-8.11.2.2 Level II Quality Control Inspectors: Ensure that Level II Inspectors have completed Department approved Level I QC Inspector training and a minimum of a 5-hour, Department approved, Level II QC Inspector training course in the respective work areas. For Incidental Precast Concrete, as an alternative to the completion of the 5-hour training course, the Department will accept CTQP Concrete Field Technician Level II or PCI Quality Control Level III certifications.

105-8.11.2.3 Plant Quality Control Manager: Ensure that QC Manager has completed Department approved Level II QC Inspector training and has a minimum of 2 years construction related experience in the specific work area.

105-8.11.2.4 Additional Requirements for Quality Control Personnel of Precast Concrete Drainage, Precast Concrete Box Culvert, and Incidental Precast Concrete Manufacturing Facilities:

105-8.11.2.4.1 Testing Personnel: Ensure the personnel performing plastic property tests have ACI Concrete Field Testing Technician-Grade I certification. Ensure the personnel performing laboratory compressive strength testing have ACI Concrete Laboratory Testing Technician-Grade 1 certification or ACI Concrete Strength Testing Technician certification.

105-8.11. 2.4.2 Batch Plant Operator: Ensure the concrete batch plant operator is qualified as a CTQP Concrete Batch Plant Operator. As an alternative to CTQP qualification, the Department will accept the completion of a minimum of a 6-hour, Department approved, Batch Plant Operator training course.

107 LITTER REMOVAL AND MOWING
(REV 12-17-09) (FA 1-27-10) (7-10)

PAGE 151. The following new section is added after Section 105.

SECTION 107
LITTER REMOVAL AND MOWING

107-1 Description.

Provide pickup, removal and disposal of litter within the project limits, excluding any areas identified in the plans as landscaping in accordance with Section 580. Mow turf or vegetation within the project limits, excluding any areas identified in the plans as landscaping areas in accordance with Section 580.

Litter, includes but is not limited to, bottles, cans, paper, tires, tire pieces, lumber, vehicle parts, metal junk, and brush debris. Turf consists of planted grasses in accordance with Section 570. Vegetation consists of planted and natural grasses, weeds, and other natural vegetation within the area to be mowed.

107-2 Operation.

107-2.1 Frequency: Begin litter removal and mowing when directed by the Engineer. Continue per the mowing frequency stated in the plans unless directed otherwise by the Engineer until final acceptance in accordance with 5-11. Mow all areas to obtain a uniform height of 6 inches.

After final acceptance, perform litter removal and mowing until new turf is established in accordance with 570-4 at no cost to the Department. Maintain turf and vegetation height between 6 and 12 inches. Do not include seed stalk or wildflowers when measuring height.

Perform litter removal prior to and in conjunction with mowing; however, the Engineer may direct litter pickups in addition to those performed in conjunction with mowing.

Do not mow new turf until a healthy root system is established. In designated wildflower areas, avoid cutting wildflowers when in bloom and when re-seeding.

107-2.2 General: Mow shoulders and medians concurrently so that not more than one mile will be left partially mowed at the conclusion of the working day. Mow turf and vegetation on slopes or around appurtenances concurrent with the mowing operation.

In areas saturated with standing water, mow or cut to the surface of the water using hand labor or other specialized equipment when standard equipment will cause damage.

Do not remove turf or other vegetation cuttings from the right-of-way, or rake or pick up the cuttings unless the cuttings are in the traveled ways, bike lanes, or sidewalk; are obstructing drainage structures; or are the result of cleaning the equipment.

107-2.3 Limitations: Maintain traffic in accordance with Section 102. When mowing within four feet of a travel lane, operate the equipment in the same direction of traffic, unless the adjacent lane is closed to traffic due to construction operations.

Perform all work during daylight hours.

107-2.4 Disposal of Litter and Debris: During each litter removal cycle, bag and remove all litter or piles at the end of each working day. Dispose of litter in accordance with applicable local and state laws. Do not store or stockpile litter within the project limits.

107-3 Method of Measurement.

For each Litter Removal cycle, the quantity to be paid will be the area, in acres, from which litter has been picked up, removed, and disposed, completed and accepted. The quantity will be determined by calculation using the lengths and widths based on the station to station dimensions shown in the plans.

For each Mowing cycle, the quantity to be paid will be the area, in acres, of mowing, completed and accepted. The quantity will be determined by calculation using the lengths and widths based on the station to station dimensions shown in the plans.

107-4 Basis of Payment.

For Litter Removal, price and payment will be full compensation for all work specified in this section.

For Mowing, price and payment will be full compensation for all work specified in this section.

No separate payment will be made for litter removal and mowing after final acceptance.

Payment will be made under:

Item No. 107 - 1- Litter Removal– per acre.

Item No. 107 - 2 - Mowing – per acre

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 Department 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 EXCAVATION AND EMBANKMENT.

(REV 7-12-10) (FA 8-16-10) (1-11)

SUBARTICLE 120-1.2 (Pages 161 – 162) is deleted and the following substituted:

120-1.2 Unidentified Areas of Contamination: When encountering or exposing any abnormal condition indicating the presence of contaminated materials, cease operations immediately in the vicinity and notify the Engineer. The presence of tanks or barrels; discolored earth, metal, wood, ground water, etc.; visible fumes; abnormal odors; excessively hot earth;

smoke; or other conditions that appear abnormal may indicate the presence of contaminated materials and must be treated with extreme caution.

Make every effort to minimize the spread of contamination into uncontaminated areas. Immediately provide for the health and safety of all workers at the job site and make provisions necessary for the health and safety of the public that may be exposed to any potentially hazardous conditions. Ensure provisions adhere to all applicable laws, rules or regulations covering potentially hazardous conditions and will be in a manner commensurate with the gravity of the conditions.

The Engineer will notify the District Contamination Impact Coordinator (DCIC) who will coordinate selecting and tasking the Department's Contamination Assessment/Remediation Contractor (CAR). Provide access to the potentially contaminated area. Preliminary investigation by the CAR Contractor will determine the course of action necessary for site security and the steps necessary under applicable laws, rules, and regulations for additional assessment and/or remediation work to resolve the contamination issue.

The CAR Contractor will delineate the contamination area(s), any staging or holding area required, and, in cooperation with the Prime Contractor and Engineer, develop a work plan that will provide the CAR Contractor's operations schedule with projected completion dates for the final resolution of the contamination issue.

The CAR Contractor will maintain jurisdiction over activities inside any outlined contaminated areas and any associated staging holding areas. The CAR Contractor will be responsible for the health and safety of workers within the delineated areas. Provide continuous access to these areas for the CAR Contractor and representatives of regulatory or enforcement agencies having jurisdiction.

Both Contractors will use the schedule as a basis for planning the completion of both work efforts. The Engineer may grant the Contract Time extensions according to the provisions of 8-7.3.2.

Cooperate with the CAR Contractor to expedite integration of the CAR Contractor's operations into the construction project. The Prime Contractor is not expected to engage in routine construction activities, such as excavating, grading, or any type of soil manipulation, or any construction processes required if handling of contaminated soil, surface water or ground water is involved. All routine construction activities requiring the handling of contaminated soil, surfacewater or groundwater will be by the CAR Contractor. Adjustments to quantities or to Contract unit prices will be made according to work additions or reductions on the part of the Prime Contractor in accordance with 4-3.

The Engineer will direct the Prime Contractor when operations may resume in the affected area.

SUBARTICLE 120-2.2.2 (Page 162) is deleted and the following substituted:

120-2.2.2 Borrow Excavation: Borrow Excavation consists of the excavation and utilization of material from authorized borrow pits, including only material that is suitable for the construction of roadway embankments or of other embankments covered by the Contract.

A Cost Savings Initiative Proposal submittal based on using borrow material from within the project limits will not be considered.

SUBARTICLE 120-6.2 (Pages 164 - 165) is deleted and the following substituted:

120-6.2 Furnishing of Borrow Areas:

To obtain the Engineer's approval to use an off-site construction activity area that involves excavation such as a borrow pit or local aggregate pit, request in writing, a review for - cultural resources involvement. Send the request to the Division of Historical Resources (DHR), Department of State, State Historic Preservation Officer, Tallahassee, FL. As a minimum, include in the request the Project Identification Number, the County, a description of the property with Township, Range, Section, etc., the dimensions of the area to be affected, and a location map. Do not start any work at the off-site construction activity area prior to receiving clearance from the DHR that no additional research is warranted.

For certain locations, the DHR will require a Cultural Resources Assessment Survey before approval can be granted. When this is required, secure professional archaeological services to complete an historical and archaeological survey report. Submit the report to the DHR with a copy to the Department. The Engineer will determine final approval or rejection of off-site construction activity areas based on input from the DHR.

Before receiving approval or before use of borrow areas, obtain written clearance from the engineer concerning compliance with the Federal Endangered Species Act and other Wildlife Regulations as specified in 7-1.4 and Section 4(f) of the USDOT Act as specified in 7-1.8.

The Department will adjust Contract Time in accordance with 8-7 for any suspension of operations required to comply with this Article. The Department will not accept any monetary claims due to delays or loss of off-site construction activity areas.

Except where the plans specifically call for the use of a particular borrow or dredging area, the Contractor may substitute borrow or dredging areas of his own choosing provided: (1) the Engineer determines the materials from such areas meet the Department's standards and other requirements for stability for use in the particular sections of the work in which it is to be placed, and (2) the Contractor absorbs any increase in hauling or other costs. Stake the corners of the proposed borrow area and provide the necessary equipment along with an operator in order for the Engineer to investigate the borrow area. The Engineer will determine test locations, collect samples, and perform tests to investigate the proposed borrow area based on soil strata and required soil properties. The Engineer will approve use of materials from the proposed area based on test results and project requirements. Final acceptance of materials will be based on Point of Use Test as described in 6-1.2.4.

Before using any borrow material from any substitute areas, obtain the Engineer's approval, in writing, for the use of the particular areas, and, where applicable, ensure that the Engineer has cross-sectioned the surface. Upon such written approval by the Engineer, consider the substitute areas as designated borrow areas.

When furnishing the dredging or borrow areas, supply the Department with evidence that the necessary permits, rights, or waivers for the use of such areas have been secured.

Do not excavate any part of a Contractor furnished borrow area which is less than 300 feet from the right-of-way of the project or any State Road until the Engineer has approved a plan for landscaping and restoring the disturbed area. Perform this landscaping and land restoration at no expense to the Department, prior to final acceptance of the project. Do not provide a borrow area closer than 25 feet to the right-of-way of any state road. In Department furnished borrow pits, do not excavate material within 5 feet of adjacent property lines.

Upon completion of excavation, neatly shape, dress, grass, vegetate, landscape, and drain all exposed areas including haul roads, as necessary so as not to present an objectionable appearance.

Meet the requirements of Section 104 when furnishing borrow areas, regardless of location.

SUBARTICLE 120-8.1 (Page 167) is deleted and the following substituted:

120-8.1 General: Construct embankments in sections of not less than 300 feet in length or for the full length of the embankment. Perform work in accordance with an approved Quality Control Plan meeting the requirements of 105-3.

For construction of mainline pavement lanes, turn lanes, ramps, parking lots, concrete box culverts and retaining wall systems, a LOT is defined as a single lift of finished embankment not to exceed 500 feet.

For construction of shoulder-only areas, bike/shared use paths, and sidewalks areas, a LOT is defined as 2,000 feet or one Day's Production, whichever is greater.

Isolated compaction operations will be considered as separate LOTS. For multiple phase construction, a LOT shall not extend beyond the limits of the phase.

SUBARTICLE 120-8.4 (Pages 169 – 170) is deleted and the following substituted:

120-8.4 Reclaimed Asphalt Pavement (RAP) Method:

120-8.4.1 General: Use only RAP material: 1) stored at facilities with an approved Florida Department of Environmental Protection Stormwater permit; or, 2) transferred directly from a milling project to the Department project. Certify the source if RAP material is from an identifiable Department project. Do not use RAP material in the following areas: 1) Construction areas that are below the seasonal high groundwater table elevation; 2) MSE Wall backfill; 3) underneath MSE Walls or 4) The top 6 inches of embankment.

Prior to placement, submit documentation to the Engineer for his approval, outlining the proposed location of the RAP material.

120-8.4.2 Soil and RAP Mixture: Place the RAP material at the location and spread uniformly, using approved methods to obtain a maximum layer thickness of 4 inches. Mix this 4 inches maximum layer of RAP with a loose soil layer of 8 to 10 inches thickness. After mixing, meet all Embankment Utilization requirements of Index 505 for the location used. Do not mix RAP in the uppermost 12 inches in order to comply with 120-8.2.1. The total RAP and other embankment material shall not exceed 12 inches per lift after mixing and compaction if the contractor can demonstrate that the density of the mixture can be achieved. Perform mixing using rotary tillers or other equipment meeting the approval of the Engineer. The Engineer will determine the order in which to spread the two materials. Mix both materials to the full depth. Ensure that the finished layer will have the thickness and shape required by the typical section. Demonstrate the feasibility of this construction method by successfully completing a 500-foot-long test section. For embankment construction, meet the requirements of 120-8. For compaction requirements of the soil and RAP mixture, meet the requirements of 120-9.

120-8.4.3 Alternate Soil and RAP Layer Construction: Construct soil in 6 to 12 inch compacted lifts and RAP in alternate layers with 6 inch maximum compacted lifts. Use

soil with a minimum LBR value of 40 to prevent failure during compaction of the overlying RAP layer. Demonstrate the feasibility of this construction method by successfully completing a 500-foot-long test section. For compaction requirements of both soil and RAP, meet the requirements of 120-9.

SUBARTICLE 120-10.1 (Pages 171-173) is expanded by the following new Subarticle:

120-10.1.7 Payment for Resolution Tests: If the Resolution laboratory results compare favorably with the Quality Control results, the Department will pay for Resolution testing. No additional compensation, either monetary or time, will be made for the impacts of any such testing.

If the Resolution laboratory results do not compare favorably with the Quality Control results, the costs of the Resolution testing will be deducted from monthly estimates. No additional time will be granted for the impacts of any such testing.

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

121 FLOWABLE FILL.

(REV 3-12-10) (FA 5-24-10) (1-11)

SECTION 121 (Pages 179 – 181) is deleted and the following substituted:

121-1 Description.

Furnish and place flowable fill as an alternative to compacted soil as approved by the Engineer. Applications for conventional flowable fill include beddings; encasements; closures

for tanks and pipes; and general backfill for trenches, embankments and walls. Applications for cellular concrete flowable fill include beddings; encasements; closures for tanks and pipes; and general backfill for embankments and walls.

121-2 Materials.

Meet the following requirements:

Fine Aggregate*	Section 902
Portland Cement (Types I, II, or III).....	Section 921
Water.....	Section 923
Admixtures**	Section 924
Fly Ash, Slag and other Pozzolanic Materials	Section 929
Preformed Foam.....	ASTM C 869

*Any clean fine aggregate with 100% passing a 3/8 inch mesh sieve and not more than 15% passing a No. 200 sieve may be used.

**High air generators or foaming agents may be used in lieu of conventional air entraining admixtures and shall be added at jobsite and mixed in accordance with the manufacturer's recommendation.

121-3 Mix Design.

Conventional flowable fill is a mixture of portland cement, fly ash, fine aggregate, admixture and water. Flowable fill contains a low cementitious content for reduced strength development. Cellular concrete flowable fill is a low density concrete made with cement, water and preformed foam to form a hardened closed cell foam material. Cellular concrete flowable fill may also contain fine aggregate, fly ash, slag and admixtures.

Submit mix designs to the Engineer for approval. The following are suggested mix guides for excavatable, non-excavatable and cellular concrete flowable fill:

	Excavatable	Non-Excavatable	Cellular Concrete
Cement	75-100 lb/yd ³	75-150 lb/yd ³	Min 150 lb/yd ³
Pozzolans or Slag	None	150-600 lb/yd ³	Optional
Water	*	*	*
Air**	5-35%	5-15%	****
28 Day Compressive Strength**	Maximum 100 psi	Minimum 125 psi	Minimum 80 psi
Unit Weight **	90-110 lb/ft ³	100-125 lb/ft ³	20-80 lb/ft ³
Fine Aggregate	***	***	Optional

*Mix designs shall produce a consistency that will result in a flowable self-leveling product at time of placement.

**The requirements for percent air, compressive strength and unit weight are for laboratory designs only and are not intended for jobsite acceptance requirements.

***Fine Aggregate shall be proportioned to yield 1 yd³.

****In cellular concrete, preformed foam shall be proportioned at the job site to yield 1 yd³ in accordance with the design requirements.

121-4 Production and Placing.

Use flowable fill manufactured at a production facility that meets the requirements of 347-3. Deliver flowable fill using concrete construction equipment. Revolution counter are waived. Place flowable fill by chute, pumping or other methods approved by the Engineer. Tremie flowable fill through water. Cellular concrete flowable fill may not be placed within three feet of the bottom elevation for roadway base courses.

121-5 Construction Requirements.

Use straps, soil anchors or other approved means of restraint to ensure correct alignment when flowable fill is used as backfill for pipe or where flotation or misalignment may occur.

Protect flowable fill from freezing for a period of 36 hours after placement.

Place flowable fill to the designated fill line without vibration or other means of compaction. Do not place flowable fill during inclement weather, e.g. rain or ambient temperatures below 40°F. Take all necessary precautions to prevent any damages caused by the hydraulic pressure of the fill during placement prior to hardening. Provide the means to confine the material within the designated space.

121-6 Acceptance.

Acceptance of flowable fill will be based on the following documentation and a minimum temperature of flowable fill at the point of delivery of 50°F.

Furnish a delivery ticket to the Engineer for each load of flowable fill delivered to the worksite. Ensure that each ticket contains the following information:

- (1) Project designation,
- (2) Date,
- (3) Time,
- (4) Class and quantity of flowable fill,
- (5) Actual batch proportions,
- (6) Free moisture content of aggregates,
- (7) Quantity of water withheld.

Leave the fill undisturbed until the material obtains sufficient strength. Sufficient strength is 35 psi penetration resistance as measured using a hand held penetrometer in accordance with ASTM C-403. Provide a hand held penetrometer to measure the penetration resistance of the hardened flowable fill.

121-7 Basis of Payment.

When the item of flowable fill is included in the Contract, payment will be made at the Contract unit price per cubic yard. Such price and payment will include all cost of the mixture, in place and accepted, determined as specified above. No measurement and payment will be made for material placed outside the neat line limits or outside the adjusted limits, or for unused or wasted material.

Payment will be made under:

Item No. 121- 70- Flowable Fill - per cubic yard.

**125 EXCAVATION FOR STRUCTURES AND PIPE – ACCEPTANCE PROGRAM.
(REV 6-3-09) (FA 8-13-09) (1-10)**

SUBARTICLE 125-9.1 (Page 187) is deleted and the following substituted:

125-9.1 General Requirements: Meet the requirements of 120-10, except replace the requirements of 120-10.1.6 with 125-9.1.1, 120-10.2 with 125-9.2, 120-10.3 with 125-9.3, and 120-10.4 with 125-10.

125-9.1.1 Reduced Testing Frequency: When no Resolution testing is required for 6 consecutive LOTs, or if required, the Quality Control test data was upheld, reduce the Quality Control density testing to one test every two Lots by identifying the substantiating tests in the Density Log Book and notifying the Engineer in writing prior to starting reduced frequency of testing. Generate random numbers based on the two LOTs under consideration. When Quality Control test frequency is reduced to one every two LOTs, obtain the Engineer's approval to place more than one LOT over an untested LOT. Assure similar compaction efforts for the untested sections. If the Verification test fails, and Quality Control test data is not upheld by Resolution testing the Quality Control testing will revert to the original frequency.

160 STABILIZING.

(REV 5-20-10) (FA 7-12-10) (1-11)

SUBARTICLE 160-3.2 (Pages 196 – 197) is deleted and the following substituted:

160-3.2 Application of Stabilizing Material: After substantially completing the roadbed grading operations, determine the type and quantity (if any) of stabilizing material necessary for compliance with the bearing value requirements. Ensure the maximum final quantity of Reclaimed Asphalt Pavement (RAP) in the subgrade area is no more than 25% by volume of the stabilized area. Notify the Engineer of the approximate quantity to be added before spreading. When additive stabilizing materials are required, spread the material uniformly over the area to be stabilized.

160-3.2.1 Sampling and Testing of Local Material: Randomly select locations for sampling using a random number generator approved by the Engineer and test at the minimum frequency listed in the table below before mixing. The Engineer will reject the material for failing QC test results. The Engineer will sample for Verification and Resolution testing at the minimum frequency listed in the table below. The Engineer will perform Verification tests at the minimum frequency listed in the table below.

Test Name	Quality Control	Verification	Resolution
Liquid Limit (LL), Plastic Index (PI), and Organic Content	One per two LOTs	One per eight LOTs	One per eight LOTs

160-3.2.1.1 Verification Comparison Criteria and Resolution

Procedures: If the QC and the Department's Verification tests meet the requirements of Section 914 then the Engineer will accept the corresponding LOTs. Otherwise, the Engineer will submit the Resolution sample to the State Materials Office or an AASHTO accredited laboratory designated by the State Materials Office to perform Resolution testing.

If the Resolution Test results meet the requirements of Section 914 then the Engineer will accept the LOTs in question. Otherwise remove the material and apply new material meeting the requirements of Section 914 and retest in accordance with 160-3.2.

SUBARTICLE 160-4.3.2(Page 200) is deleted and the following substituted:

160-4.3.2 Department Verification Tests:

160-4.3.2.1 Bearing Value & Soil Classification: The Engineer will collect a sample at a location other than the location where the sample was collected in 160-4.3.1.3, and test the Stabilized Subgrade for determination of the LBR in accordance with FM 5-515. The Engineer will select test locations, including Stations and Offsets, using a Random Number generator, based on the LOTs under consideration.

If Local Material is used for stabilizing, the Engineer will determine compliance with embankment utilization requirements and 160-3.4 by testing and classifying the Stabilized Subgrade in accordance with AASHTO T88 and AASHTO M 145 at the frequency shown in 160-4.2.4.

160-4.3.2.1.1 Unsoaked LBR: The Engineer will sample and test the initial LOT for one soaked and one unsoaked LBR if consideration of the Unsoaked LBR has been approved.

160-4.3.2.2 Mixing Depth: The Engineer will witness the Contractor's mixing depth checks to ensure compliance with 160-4.2.2. The Engineer will select test locations, including Stations and Offsets, using a Random Number generator.

160-4.3.2.3 Modified Proctor Maximum Density: The Engineer will randomly select one of the retained split samples and test in accordance with FM 1-T 180, Method D.

**234 SUPERPAVE ASPHALT BASE.
(REV 6-11-10) (FA 8-16-10) (1-11)**

ARTICLE 234-1 (Page 218) is deleted and the following substituted:

234-1 Description.

Construct a Superpave Asphalt Concrete base course as defined in these Specifications. Base course mixes are designated as B-12.5. The Contractor may use a Type SP-12.5 mixture, (Traffic Level B or C) in lieu of a Type B-12.5.

ARTICLE 234-5 (Page 219) is deleted and the following substituted:

234-5 Acceptance of the Mixture.

The mixture will be accepted in accordance with the requirements of 334-5, except density testing for acceptance will not be performed in areas as defined in 334-5.1.2. In these situations compact the base in accordance with the rolling procedure (equipment and pattern) submitted as part of the Quality Control (QC) Plan and as approved by the Engineer. Use the permissible variations from longitudinal and transverse grades as specified in 200-7. The pay factor for LOTs where there are areas not requiring density testing will be prorated based on a pay factor of 1.00 for the tonnage of material in areas not requiring density testing and the actual pay factor for the tonnage of material in areas requiring density.

ARTICLE 234-8 (Pages 220 - 221) is deleted and the following substituted:

234-8 Thickness Requirements.

234-8.1 General: The total thickness of the Type B asphalt layers will be the plan thickness as shown in the Contract Documents. Before paving, propose a thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan thickness. For construction purposes, the plan thickness and individual layer thickness will be converted to spread rate based on the maximum specific gravity of the asphalt mix being used, as well as the minimum density level, as shown in the following equation:

$$\text{Spread rate (lbs. per square yard)} = t \times G_{mm} \times 43.3$$

Where: t = Thickness (in.) (Plan thickness or individual layer thickness)

G_{mm} = Maximum specific gravity from the verified mix design

The weight of the mixture shall be determined as provided in 320-2.2. For target purposes only, spread rate calculations should be rounded to the nearest whole number.

234-8.2 Spread Rate Tolerance: Control the average spread rate on a daily basis to within plus or minus 5% of the target spread rate for the individual layer(s) established by the Engineer. When the average daily spread rate is outside this tolerance from the target, adjust the spread rate to the required value established by the Engineer. The Engineer will periodically verify the spread rate at the job site during the paving operation.

234-8.3 Allowable Deficiencies: The Engineer will allow a maximum deficiency from the specified spread rate for the total thickness as follows:

1. For pavement of a specified thickness of 2-1/2 inches or more: 50 lbs. per square yard.
2. For pavement of a specified thickness of less than 2-1/2 inches: 25 lbs. per square yard.

234-8.4 Pavement Exceeding Allowable Deficiency in Spread Rate: Where the deficiency in spread rate for the total thickness is: (1) in excess of 50 lbs. per square yard for pavements with a specified thickness of 2-1/2 inches or more, or (2) in excess of 25 lbs. per square yard for pavements with a specified thickness of less than 2-1/2 inches, the Engineer may require removal and replacement at no cost or may require a correction as specified in 234-8.5. The Engineer may require the Contractor to core the pavement for thickness in order to determine the area of pavement with deficient thickness.

As an exception to the above, the Contractor may leave pavement outside the main roadway in place without compensation when the Engineer allows, even though the deficiency exceeds the tolerance as specified above.

The Department will not compensate the Contractor for any pavement removed or for the work of removing such pavement.

234-8.5 Correcting Deficiency by Adding New Surface Material: In the event the total thickness as determined by the spread rate is excessively deficient as defined above and if approved by the Engineer for each particular location, correct the deficient thickness by adding new surface material and compacting it using a rolling pattern as approved by the Engineer. The Engineer will determine the area to be corrected and the thickness of new material added. Perform all overlaying and compacting at no expense to the Department.

300 PRIME AND TACK COATS FOR BASE COURSES – RATE OF APPLICATION.
(REV 6-10-10) (FA 8-16-10) (1-11)

SUBARTICLE 300-8.4 (Page 240) is deleted and the following substituted:

300-8.4 Rate of Application: Use a rate of application as defined in Table 300-1. Control the rate of application to be within plus or minus 0.01 gal. per square yard of the target application rate. The target application rate may be adjusted by the Engineer to meet specific field conditions. Determine and record the rate of application a minimum of twice per day, once at the beginning of each day's production and again as needed to control the operation. When using RA-550, multiply the target rate of application by 0.6.

Table 300-1 Tack Coat Application Rates		
Asphalt Mixture Type	Underlying Pavement Surface	Target Tack Rate (gal/yd ²)
Base Course, Structural Course, Dense Graded Friction Course	Newly Constructed Asphalt Layers	0.02 minimum
	Milled Surface or Oxidized and Cracked Pavement	0.06
	Concrete Pavement	0.08
Open Graded Friction Course	Newly Constructed Asphalt Layers	0.05
	Milled Surface	0.07

320 HOT BITUMINOUS MIXTURES – PLANT, METHODS, AND EQUIPMENT.
(REV 1-8-10) (FA 2-2-10) (7-10)

SUBARTICLE 320-2.2 (Pages 241 – 244) is deleted and the following substituted:

320-2.2 Electronic Weigh Systems: Equip the asphalt plant with an electronic weigh system that: has an automatic printout, is certified every six months by an approved certified scale technician, and meets weekly comparison checks with certified truck scales as specified in 320-2.2.4. Weigh all plant produced hot mix asphalt on the electronic weigh system, regardless of the method of measurement for payment.

Include, as a minimum, the following information on the printed delivery ticket:

- (a) Sequential load number.
- (b) Project number.
- (c) Date.
- (d) Name and location of plant.
- (e) Mix design number.
- (f) Place for hand-recording mix temperature.
- (g) Truck number.
- (h) Gross, tare, and net tonnage per truck (as applicable).
- (i) Daily total tonnage of mix for the mix design.

Print the delivery ticket with an original and at least one copy. Furnish the original to the Engineer at the plant and one copy to the Engineer at the paving site.

Utilize any one of the following three electronic weigh systems:

320-2.2.1 Electronic Weigh System on the Truck Scales: Provide an electronic weigh system on all truck scales, which is equipped with an automatic recordation system that is approved by the Engineer. Use scales of the type that directly indicate the total weight of the loaded truck. Use scales meeting the requirements for accuracy, condition, etc., of the Bureau of Weights and Measures of the Florida Department of Agriculture, and re-certify such fact every six months, either by the Bureau of Weights and Measures or by a registered scale technician.

320-2.2.2 Electronic Weigh System on Hopper Beneath a Surge or Storage Bin: Provide an electronic weigh system on the hopper (hopper scales or load cells) beneath the surge or storage bin, which is equipped with an automatic recordation system approved by the Engineer.

320-2.2.3 Automatic Batch Plant with Printout: For batch plants, provide an approved automatic printer system which will print the individual or cumulative weights of aggregate and liquid asphalt delivered to the pugmill and the total net weight of the asphalt mix measured by hopper scales or load cell type scales. Use the automatic printer system only in conjunction with automatic batching and mixing control systems that have been approved by the Engineer.

320-2.2.4 Weekly Electronic Weigh System Comparison Checks: Check the accuracy of the electronic weighing system at the commencement of production and thereafter at least once a week during production by one of the following two methods:

320-2.2.4.1. Electronic Weigh Systems on Truck Scales:

(a) The Engineer will randomly select a loaded truck of asphalt mix and record the truck number and gross weight from the Contractor's delivery ticket.

(b) Weigh the selected truck on a certified truck scale, which is not owned by the Contractor and record the gross weight for the comparison check. If another certified truck scale is not available, the Engineer may permit another set of certified truck scales owned by the Contractor to be used. The Engineer may elect to witness the scale check.

(c) The gross weight of the loaded truck as shown on the Contractor's delivery ticket will be compared to the gross weight of the loaded truck from the other certified truck scale. The maximum permissible deviation is 8 pounds per ton of gross weight of the loaded truck, based on the certified truck scale weight.

(d) If the distance from the asphalt plant to the nearest certified truck scale is enough for fuel consumption to affect the accuracy of the comparison checks, a fuel adjustment may be calculated by using the truck odometer readings for the distance measurement, and 6.1 miles per gallon for the fuel consumption rate, and 115 ounces per gallon for fuel weight.

(e) During production, when an additional certified truck scale is not available for comparison checks, the Engineer may permit the Contractor to weigh the truck on his certified scales used during production and then weigh it on another certified truck scale, as soon the other scale is available for the comparison checks.

In addition to the periodic checks as specified above, check the scales at any time the accuracy of the scales becomes questionable. When such inaccuracy does not appear to be sufficient to seriously affect the weighing operations, the Engineer will allow a period of two calendar days for the Contractor to effect the required scales check. However, in

the event the indicated inaccuracy is sufficient to seriously affect the mixture, the Engineer may require immediate shut-down until the accuracy of the scales has been checked and necessary corrections have been made. Include the cost of all scale checks in the bid price for asphalt concrete, at no additional cost to the Department.

320-2.2.4.2. For Electronic Weigh Systems on Hoppers Beneath a Surge or Storage Bins and Automatic Batch Plants with Printout:

(a) The Engineer will randomly select a loaded truck of asphalt mix and record the truck number, and the net weight of the asphalt mix from the Contractor's delivery ticket.

(b) Weigh the selected truck on a certified truck scale, which is not owned by the Contractor and record the gross weight for the comparison check. If another certified truck scale is not available, the Engineer may permit another set of certified truck scales owned by the Contractor to be used. The Engineer may elect to witness the scale check.

(c) Deliver the asphalt mix to the project, then weigh the selected empty truck on the same certified truck scales. Record the tare weight of the truck.

(d) Compare the net weight of the asphalt mix from the delivery ticket to the calculated net weight of the asphalt mix as determined by the certified truck scale weights. The maximum permissible deviation is 8 pounds per ton of load, based on the certified truck scale weight.

(e) Use the fuel adjustment as specified in 320-2.2.4.1(d), when the distance from the asphalt plant to the nearest certified truck scale is enough for fuel consumption to affect the accuracy of the comparison checks.

(f) During production, when an additional certified truck scale is not available for comparison checks, the Engineer may permit the Contractor to load a truck with aggregate from the pugmill, surge or storage bin, and follow the above procedures to conduct the comparison checks as soon as certified truck scale is available.

If the check shows a greater difference than the tolerance specified above, then recheck on a second set of certified scales. If the check and recheck indicate that the printed weight is out of tolerance, have a certified scale technician check the electronic weigh system and certify the accuracy of the printer. While the system is out of tolerance and before its adjustment, the Engineer may allow the Contractor to continue production only if provisions are made to use a set of certified truck scales to determine the truck weights.

SUBARTICLE 320-5.1.2 (Page 246) is deleted and the following substituted:

320-5.1.2 Automatic Screed Control: For all asphalt courses, placed with mechanical spreading and finishing equipment, equip the paving machine with automatic longitudinal screed controls of either the skid type, traveling stringline type, or non-contact averaging ski type. Ensure that the length of the skid, traveling stringline, or non-contact averaging ski is at least 25 feet. On the final layer of base, overbuild, and structural courses, and for friction courses, use the joint matcher in lieu of the skid, traveling stringline, or non-contact averaging ski on all passes after the initial pass. Furnish a paving machine equipped with electronic cross slope controls.

SUBARTICLE 320-5.3.1 (Page 246) is deleted and the following substituted:

320-5.3.1 Steel-Wheeled Rollers: Provide compaction equipment capable of meeting the density requirements described in these Specifications. In the event that density testing is not required, provide a tandem steel-wheeled roller weighing 5 to 15 tons for seal rolling, and for the final rolling, use a separate roller with a weight of 5 to 15 tons. Variations from these requirements shall be approved by the Engineer.

**327 MILLING OF EXISTING ASPHALT PAVEMENT – CONSTRUCTION.
(REV 1-26-10) (FA 2-2-10) (7-10)**

ARTICLE 327-3 (Paged 248–249) is deleted and the following substituted:

327-3 Construction.

327-3.1 General: Remove the existing raised reflective pavement markers prior to milling. Include the cost of removing existing pavement markers in the price for milling.

When milling to improve rideability or cross slope, remove the existing pavement to the average depth specified in the plans, in a manner that will restore the pavement surface to a uniform cross-section and longitudinal profile. The Engineer may require the use of a stringline to ensure maintaining the proper alignment.

Establish the longitudinal profile of the milled surface in accordance with the milling plans. Ensure that the final cross slope of the milled surface parallels the surface cross slope shown on the plans or as directed by the Engineer. Establish the cross slope of the milled surface by a second sensing device near the outside edge of the cut or by an automatic cross slope control mechanism. The plans may waive the requirement of automatic grade or cross slope controls where the situation warrants such action.

Operate the milling machine to minimize the amount of dust being emitted. The Engineer may require prewetting of the pavement.

Provide positive drainage of the milled surface and the adjacent pavement. Perform this operation on the same day as milling. Repave all milled surfaces no later than the day after the surface was milled unless otherwise stated in the plans.

If traffic is to be maintained on the milled surface prior to the placement of the new asphalt concrete, provide suitable transitions between areas of varying thickness to create a smooth longitudinal riding surface. Produce a pattern of striations that will provide an acceptable riding surface. The Engineer will control the traveling speed of the milling machine to produce a texture that will provide an acceptable riding surface.

Prior to opening an area which has been milled to traffic, sweep the pavement with a power broom or other approved equipment to remove, to the greatest extent practicable, fine material which will create dust under traffic. Sweep in a manner that will minimize the potential for creation of a traffic hazard and to minimize air pollution.

Sweep the milled surface with a power broom prior to placing asphalt concrete.

In urban and other sensitive areas, use a street sweeper or other equipment capable of removing excess milled materials and controlling dust. Obtain the Engineer's approval of such equipment, contingent upon its demonstrated ability to do the work.

Perform the sweeping operation immediately after the milling operations or as directed by the Engineer.

327-3.2 Quality Control Requirements: Furnish an electronic level with a length of 4 feet and an accuracy of plus or minus 0.1 degree approved by the Engineer for the control of cross slope. Make this electronic level available at the jobsite at all times during milling operations. Calibrate and compare electronic levels in accordance with 330-12.3.1 at a minimum frequency of once per day before any milling operation.

Multiple cuts may be made to achieve the required pavement configuration or depth of cut. Measure the cross slope of the milled surface by placing the level at the center location of a lane and perpendicular to the roadway centerline. Record all the measurements to the nearest 0.1% on an approved form and submit to the Engineer for documentation.

1. Tangent Sections: Measure the cross slope per lane at a minimum frequency of one measurement every 100 feet. Calculate the absolute deviation of cross slope at each measurement and then average the absolute deviation of ten consecutive cross slope measurements. The absolute deviation is the positive value of a deviation. When the average absolute deviation cross slope is consistently within the acceptance tolerance as shown in Table 327-1 and upon approval by the Engineer, the frequency of the cross slope measurements can be reduced to one measurement every 200 feet during milling operations..

2. Superelevated Sections: Measure the cross slope every 100 feet per lane within the length of full superelevation. Calculate the absolute deviation of each measurement and then average the absolute deviation of ten consecutive cross slope measurements. For every transition section, measure the cross slope at control points identified in the plans or, if not shown in the plans, at a control point at a location of 0.0% cross slope. For curves where the length of the fully superelevated section is less than 250 feet, measure the cross slope at the beginning point, midpoint and ending point of the fully superelevated section, calculate the absolute deviation and average. When the number of measurements is less than ten and the length of full superelevation is greater than 250 feet, average the absolute deviation of all measurements.

If the average absolute deviation of the cross slope measurements falls outside the acceptance tolerance shown in Table 327-1, stop the milling operations and make adjustments until the problem is resolved to the satisfaction of the Engineer. If an individual cross slope deviation falls outside the acceptance tolerance as shown in Table 327-1, make corrections only in the deficient area to the satisfaction of the Engineer at no cost to the Department. For pavement with multiple cuts, the deficient areas not caused by the final cut may be left in place upon approval of the Engineer. All milling corrections shall be completed before placement of the asphalt course unless stated otherwise in the plans or as determined by the Engineer.

The limits of deficient areas requiring correction may be verified and adjusted with more accurate measurement methods, including survey instruments, upon approval by the Engineer at no cost to the Department. Should the Contractor wish to have any corrections waived, submit a request to the Engineer for approval. The Engineer may waive the corrections at no reduction in payment if an engineering determination indicates that the deficiencies are sufficiently separated so as not to significantly affect the final cross slope or project grade.

For intersections, tapers, crossovers, transitions at the beginning and end of the project, bridge approaches and similar areas, adjust the cross slope to match the actual site conditions, or as directed by the Engineer.

TABLE 327-1 Cross Slope Milling Acceptance Tolerance		
Roadway Feature	Individual Absolute Deviation	Average Absolute Deviation
Tangent section (including turn lanes)	0.4%	0.2%
Superelevated curve	0.4%	0.2%
Shoulder	0.5%	0.5%

In the event that the distance between tow edges of deficient areas is less than 100 feet, the correction work shall include the area between the deficient sections.

327-3.3 Verification: The Engineer will verify the Contractor's cross slope measurements by randomly taking a minimum of ten cross slope measurements per lane per mile in tangent sections, control points in transition sections, and a minimum of three cross slope measurements on fully superelevated sections. The Engineer will measure the cross slope of the milled surface by placing the level at the center location of a lane and perpendicular to the roadway centerline. If the average absolute deviation or an individual cross slope deviation falls outside the acceptance tolerance as shown in Table 327-1, immediately make a comparison check at the QC test locations to verify the QC measurements in the questionable section. If the comparisons are beyond the acceptable comparison tolerance in accordance with 327-3.2, stop the milling operation until the problem is resolved to the satisfaction of the Engineer. Correct any cross slope not meeting the individual deviation acceptance tolerance at no cost to the Department. The Engineer reserves the right to check the cross slope of the milled surface at any time by taking cross slope measurements at any location.

330 HOT BITUMINOUS MIXTURES – GENERAL CONSTRUCTION REQUIREMENTS.

(REV 5-24-10) (FA 8-16-10) (1-11)

SECTION 330 (Pages 250–265) is deleted and the following substituted:

SECTION 330 HOT BITUMINOUS MIXTURES - GENERAL CONSTRUCTION REQUIREMENTS

330-1 Description.

Construct plant-mixed hot bituminous pavements and bases. Establish and maintain a quality control system that provides assurance that all materials, products and completed construction submitted for acceptance meet Contract requirements.

330-2 Quality Control Requirements.

330-2.1 Minimum Quality Control Plan Requirements: In addition to the requirements set forth in Section 105, perform as a minimum the following activities necessary to maintain process control and meet specification requirements:

Stockpiles: Assure materials are placed in the correct stockpile; assure good stockpiling techniques; inspect stockpiles for separation, contamination, segregation, etc.; properly identify and label each stockpile.

Incoming Aggregate: Obtain gradations and bulk specific gravity (G_{sb}) values from aggregate supplier for reference; determine the gradation of all component materials; routinely compare gradations and G_{sb} values to mix design.

Cold Bins: Calibrate the cold gate/feeder belt for each material; determine cold gate/feeder belt settings; observe operation of cold feeder for uniformity.

Dryer: Observe pyrometer for aggregate temperature control; observe efficiency of the burner.

For Batch Plants, determine percent used and weight to be pulled from each bin to assure compliance with Mix Design, check mixing time, and check operations of weigh bucket and scales.

For Drum Mixer Plants, determine aggregate moisture content, and calibrate the weigh bridge on the charging conveyor.

Control Charts: Plot and keep charts updated daily for all Quality Control Sampling and Testing and post in the asphalt lab where they can be seen. Provide the following charts:

1. All components used to determine the composite pay factor (No. 8 sieve, No. 200 sieve, asphalt binder content, air voids, and density) by lot.
2. Gradation of incoming aggregate.
3. Gradation, asphalt binder content, and maximum specific gravity (G_{mm}) of RAP.
4. Any other test result or material characteristic (as determined by the Contractor) necessary for process control.

The above listed minimum activities are to be considered normal activities necessary to control the production of hot mix asphalt at an acceptable quality level. It is recognized, however, that depending on the type of process or materials, some of the activities listed may not be necessary and in other cases, additional activities may be required. The frequency of these activities will also vary with the process and the materials. When the process varies from the defined process average and variability targets, the frequency of these activities will be increased until the proper conditions have been restored.

330-2.2 Minimum Process Control Testing Requirements: Perform, as a minimum, the following activities at the testing frequencies provided below:

Asphalt Plant

1. Asphalt Mix: Determine the asphalt binder content; mix gradation and volumetric properties at a minimum frequency of one per day. In the event that the daily production exceeds 1,000 tons, perform these tests a minimum of two times per day. Quality Control tests used in the acceptance decision may be used to fulfill this requirement. Verify modifier addition.

2. Aggregate: Test one sample for gradation per 1,000 tons of incoming aggregate, as it is stockpiled.

3. Aggregate moisture content from stockpiles or combined cold feed aggregate - one per day.

4. RAP: Test one sample per 1000 tons of incoming material (prior to incorporation into the mix) for gradation and asphalt binder content. Test one sample per 5,000

tons of incoming material (prior to incorporation into the mix) for maximum specific gravity (G_{mm}) and recovered viscosity.

5. Mix temperature at the plant for the first five loads and one out of every five loads thereafter.

6. Other tests (as determined necessary by the Contractor) for process control.

Roadway

1. Monitor the pavement temperature with an infrared temperature device. Monitor the roadway density with either 6 inches diameter roadway cores, a nuclear density gauge, or other density measuring device, at a minimum frequency of once per 1,500 feet of pavement. When the layer thickness is greater than or equal to 1 inch (or the spread rate is greater than or equal to 105 lb per yd²) and an approved rolling pattern is used in lieu of density testing, identify in the QC Plan how the pavement density will be monitored.

2. Mix temperature at the roadway for the first five loads and one out of every five loads thereafter.

3. Monitor the pavement smoothness with a 15-foot rolling straightedge, as required by these specifications.

4. Monitor the pavement cross slope at a frequency necessary to fulfill the requirements of these specifications, and identify a system to control the cross slope of each pavement layer during construction.

5. Monitor the mix spread rate at the beginning of each day's production, and as needed to control the operations, at a minimum of once per 200 tons placed to ensure that the spread rate is within 5% of the target spread rate. When determining the spread rate, use, at a minimum, an average of five truckloads of mix. When the average spread rate is beyond plus or minus 5% of the target spread rate, monitor the thickness of the pavement layer closely and adjust the construction operations.

If the Contractor fails to maintain an average spread rate within plus or minus 5% of the target spread rate for two consecutive days, the Engineer may elect to stop the construction operation at any time until the problem is resolved.

330-2.3 Minimum Quality Control System Requirements:

330-2.3.1 Personnel Qualifications: Provide Quality Control Technicians in accordance with Section 105.

330-2.3.2 Hot Mix Asphalt Testing Laboratory Requirements: Furnish or have furnished a fully equipped asphalt laboratory (permanent or portable) at the production site. The Laboratory must be qualified under the Department's Laboratory Qualification Program, as described in Section 105-6. In addition, the laboratory shall meet the following requirements:

1. Area - The effective working area of the laboratory shall be a minimum of 180 ft², with a layout of which will facilitate multiple tests being run simultaneously by two technicians. This area does not include the space for desks, chairs and file cabinets. Any variations shall be approved by the Engineer.

2. Lighting - The lighting in the lab must be adequate to illuminate all areas of the work.

3. Temperature Control - Equip the lab with heating and air conditioning units that provide a satisfactory working environment.

4. Ventilation - Equip the lab with fume hoods and exhaust fans that will remove all hazardous fumes from within the laboratory in accordance with OSHA requirements.

5. Equipment and Supplies - Furnish the lab with the necessary sampling and testing equipment and supplies for performing contractor Quality Control and Department Verification Sampling and Testing. A detailed list of equipment and supplies required for each test is included in the appropriate FDOT, AASHTO, or ASTM Test Method.

6. Calibration of the Superpave Gyratory Compactor: Calibrate the Superpave Gyratory Compactor in accordance with the manufacturer's recommendations. Identify in the Quality Control Plan the established frequencies and document all calibrations.

7. Personal Computer - Provide a personal computer capable of running a Microsoft Excel™ spreadsheet program, along with a printer.

8. Communication - Provide a telephone and fax machine (with a private line) for the use of the testing facility's quality control personnel. In addition, provide an Internet connection capable of uploading data to the Department's database and for e-mail communications.

330-3 Limitations of Operations.

330-3.1 Weather Limitations: Do not transport asphalt mix from the plant to the roadway unless all weather conditions are suitable for the laying operations.

330-3.2 Limitations of Laying Operations:

330-3.2.1 General: Spread the mixture only when the surface upon which it is to be laid has been previously prepared, is intact, firm, dry, clean, and the tack or prime coat, with acceptable spread rate, is properly broken or cured. Do not place friction course until the adjacent shoulder area has been dressed and grassed.

330-3.2.2 Temperature: Spread the mixture only when the air temperature in the shade and away from artificial heat is at least 40°F for layers greater than 1 inch (100 lb/yd²) in thickness and at least 45°F for layers 1 inch (100 lb/yd²) or less in thickness (this includes leveling courses). The minimum temperature requirement for leveling courses with a spread rate of 50 lb/yd² or less is 50°F. The minimum ambient temperature requirement may be reduced by 5°F when using warm mix technology, if mutually agreed to by both the Engineer and the Contractor.

330-3.2.3 Wind: Do not spread the mixture when the wind is blowing to such an extent that proper and adequate compaction cannot be maintained or when sand, dust, etc., are being deposited on the surface being paved to the extent that the bond between layers will be diminished.

330-3.2.4 Night Paving: Meet the requirements of 8-4.1.

330-4 Preparation of Asphalt Binder.

Deliver the asphalt binder to the asphalt plant at a temperature not to exceed 370°F, and equip the transport tanks with sampling and temperature sensing devices meeting the requirements of 300-3.2. Maintain the asphalt binder in storage within a range of 230 to 370°F in advance of mixing operations. Maintain constant heating within these limits, and do not allow wide fluctuations of temperature during a day's production.

330-5 Preparation of Aggregates.

330-5.1 Stockpiles: Place each aggregate component in an individual stockpile, and separate each from the adjacent stockpiles, either by space or by a system of bulkheads. Prevent the intermingling of different materials in stockpiles at all times. Identify each stockpile, including RAP, as shown on the mix design.

330-5.2 Prevention of Segregation: Form and maintain stockpiles in a manner that will prevent segregation. If a stockpile is determined to have excessive segregation, the Engineer will disapprove the material for use on the project until the appropriate actions have been taken to correct the problem.

330-5.3 Blending of Aggregates: Stockpile all aggregates prior to blending or placing in the cold hoppers. Place all aggregates to be blended or proportioned in separate bins at the cold hopper. Proportion by means of securely positioned calibrated gates or other approved devices.

330-5.4 Cold Bins:

330-5.4.1 Adequacy of Bins: Use separate bin compartments in the cold aggregate feeder that are constructed to prevent any spilling or leakage of aggregate from one bin to another. Ensure that each bin compartment has the capacity and design to permit a uniform flow of aggregates. Mount all of the bin compartments over a feeder of uniform speed, which will deliver the specified proportions of the separate aggregates to the drier at all times. If necessary, equip the bins with vibrators to ensure a uniform flow of the aggregates at all times.

330-5.4.2 Gates: Provide each bin compartment with a gate which is adjustable in a vertical direction. Provide gates that can be held securely at any specified vertical opening. Equip the gates with a measuring device for measuring the vertical opening of the gates from a horizontal plane level with the bottom of the feeder.

330-5.5 Mineral Filler: If mineral filler is required in the mix, feed or weigh it in separately from the other aggregates.

330-5.6 Heating and Drying: Heat and dry the aggregates before screening. Control the temperature of the aggregates so that the temperature of the completed mixture at the plant falls within the permissible range allowed by this Section.

330-5.7 Screening Unit:

330-5.7.1 Oversize Aggregate: Remove any oversized pieces of aggregate by the use of a scalping screen. Do not return this oversized material to the stockpile for reuse unless it has been crushed and reprocessed into sizes that will pass the scalping screen.

330-5.7.2 Screening: Ensure that the quantity of aggregates being discharged onto the screens does not exceed the capacity of the screens to actually separate the aggregates into the required sizes. Allow up to a maximum of 10% plus-10 material in the minus-10 bin. The Engineer will determine the maximum amount of minus-10 material allowed in the plus-10 bins, in accordance with its effect on the uniformity of the mix.

330-6 Preparation of the Mixture.

330-6.1 Batch Mixing:

330-6.1.1 Aggregates: Once the dried aggregates and mineral filler (if required) are prepared in the manner previously described and combined in batches to meet the verified mix design by weighing each separate bin size, convey them to the empty mixer.

330-6.1.2 Asphalt Binder: Introduce the accurately measured hot asphalt binder into the mixer simultaneously with, or after, the hot aggregates. Continue mixing until the mixture is thoroughly uniform with all particles fully coated.

330-6.1.3 Mixing Time: The mixing time begins when the measuring devices for both the asphalt and the aggregates indicate that all the material is in the mixer, and continues until the material begins to leave the mixing unit. Since the mixing time varies in relation to the nature of the aggregates and the capacity of the mixer, mix sufficiently to produce a thoroughly and uniformly coated mixture.

330-6.2 Continuous Mixing: Introduce the dried aggregates and mineral filler (if required), prepared as specified and proportioned to meet the verified mix design, into the mixer in synchronization with the accurate feeding of the hot asphalt binder. Mix sufficiently to produce a thoroughly and uniformly coated mixture.

330-6.3 Mix Temperature: Heat and combine the ingredients of the mix in such a manner as to produce a mixture with a temperature, when discharged from the pugmill or surge bin, which is within the master range as defined below.

Determine the temperature of the completed mixture using a quick-reading thermometer through a hole in the side of the loaded truck immediately after loading. Locate 1/4 inch hole on both sides of the truck body within the middle third of the length of the body, and at a distance from 6 to 10 inches above the surface supporting the mixture. If a truck body already has a hole located in the general vicinity of the specified location, use this hole. At the Engineer's discretion, the Contractor may take the temperature of the load over the top of the truck in lieu of using the hole in the side of the truck.

The normal frequency for taking asphalt mix temperatures will be for each day, for each design mix on the first five loads and one out of every five loads thereafter. Take the temperature of the asphalt mix at the plant and at the roadway before the mix is placed at the normal frequency. Record the temperature on the front of the respective delivery ticket. The Engineer shall review the plant and roadway temperature readings and may take additional temperature measurements at any time.

The master range for all mix designs will be the target mix temperature from the mix design $\pm 30^{\circ}\text{F}$. There are two master ranges; one at the asphalt plant (mixing temperature from the mix design $\pm 30^{\circ}\text{F}$) and one at the roadway (compaction temperature from the mix design $\pm 30^{\circ}\text{F}$). Reject any load or portion of a load of asphalt mix at the plant with a temperature outside of this master range. Reject any load or portion of a load of asphalt mix at the roadway with a temperature outside of this master range. The Engineer will be immediately notified of the rejection.

If any single load at the plant or at the roadway is within the master range but differs from the target mix temperature by more than $\pm 25^{\circ}\text{F}$ or if the average difference of the temperature measurements from the target mix temperature for five loads exceeds $\pm 15^{\circ}\text{F}$, the temperature of every load will be monitored until the temperature falls within the specified tolerance range in Table 330-1; at this time the normal frequency may be resumed.

Table 330-1	
Temperature Tolerance From Verified Mix Design	
Any Single Measurement	$\pm 25^{\circ}\text{F}$
Average of Any Five Consecutive Measurements	$\pm 15^{\circ}\text{F}$

330-6.4 Maximum Period of Storage: Allow the maximum time that any mix may be kept in a hot storage or surge bin to be 72 hours.

330-6.5 Contractor's Responsibility for Mixture Requirements: Produce a homogeneous mixture, free from moisture and with no segregated materials, that meets all specification requirements. Also apply these requirements to all mixes produced by the drum mixer process and all mixes processed through a hot storage or surge bin, both before and after storage.

330-7 Transportation of the Mixture.

Transport the mixture in tight vehicles previously cleaned of all foreign material. After cleaning, thinly coat the inside surface of the truck bodies with soapy water or an asphalt release agent as needed to prevent the mixture from adhering to the beds. Do not allow excess liquid to pond in the truck body. Do not use diesel fuel or any other hazardous or environmentally detrimental material as a coating for the inside surface of the truck body. Cover each load during cool and cloudy weather and at any time it appears rain is likely during transit with a tarpaulin or waterproof cover meeting requirements of 320-5.4.

330-8 Preparation of Application Surfaces.

330-8.1 Cleaning: Prior to the laying of the mixture, clean the surface of the base or pavement to be covered of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming where necessary.

330-8.2 Patching, Leveling, and Overbuild Courses: Where an asphalt mix is to be placed on an existing pavement or old base which is irregular, and wherever the plans indicate, bring the existing surface to proper grade and cross-section by the application of patching, leveling, or overbuild courses.

330-8.3 Application Over Surface Treatment: Where an asphalt mix is to be placed over a newly constructed surface treatment, sweep and dispose of all loose material from the paving area.

330-8.4 Coating Surfaces of Contacting Structures: Paint all structures which will be in actual contact with the asphalt mixture, with the exception of the vertical faces of existing pavement, curbs and gutter, with a uniform coating of asphalt binder to provide a closely bonded, watertight joint.

330-8.5 Tack Coat:

330-8.5.1 Tack Coat Required: Apply a tack coat, as specified in Section 300, on existing pavement structures that are to be overlaid with an asphalt mix and between successive layers of all asphalt mixes.

330-8.5.2 Tack Coat at Engineer's Option: Apply a tack coat on the following surfaces only when so directed by the Engineer:

1. Freshly primed bases.
2. Surface treatment.

330-9 Placing Mixture.

330-9.1 Requirements Applicable to All Types:

330-9.1.1 Alignment of Edges: Lay all asphalt concrete mixtures, including leveling courses, other than the pavement edge just adjacent to curb and gutter or other true edges, by the stringline method to obtain an accurate, uniform alignment of the pavement edge. Control the unsupported pavement edge to ensure that it will not deviate more than ± 1.5 inches from the stringline.

330-9.1.2 Temperature of Spreading: Maintain the temperature of the mix at the time of spreading within the master range as defined in 330-6.3. The minimum frequency for taking mix temperatures on the roadway will be as indicated in 330-6.3. Any load or portion of a load of asphalt mix on the roadway with a temperature outside of the master range shall be rejected for use on the project. The Engineer will be immediately notified of the rejection.

330-9.1.3 Rain and Surface Conditions: Immediately cease transportation of asphalt mixtures from the plant when rain begins at the roadway. Do not place asphalt mixtures

while rain is falling, or when there is water on the surface to be covered. Once the rain has stopped and water has been removed from the tacked surface to the satisfaction of the Engineer and the temperature of the mixture caught in transit still meets the requirements as specified in 330-9.1.2, the Contractor may then place the mixture caught in transit.

330-9.1.4 Speed of Paver: Establish the forward speed of the asphalt paver based on the rate of delivery of the mix to the roadway but not faster than the optimum speed needed to adequately compact the pavement.

330-9.1.5 Number of Crews Required: For each paving machine operated, use a separate crew, each crew operating as a full unit. The Contractor's CTQP Paving Level II technician in charge of the paving operations may be responsible for more than one crew but must be physically accessible to the Engineer at all times when placing mix.

330-9.1.6 Checking Depth of Layer: Check the depth of each layer at frequent intervals, and make adjustments when the thickness exceeds the allowable tolerance. When making an adjustment, allow the paving machine to travel a minimum distance of 32 feet to stabilize before the second check is made to determine the effects of the adjustment.

330-9.1.7 Hand Spreading: In limited areas where the use of the spreader is impossible or impracticable, the Contractor may spread and finish the mixture by hand.

330-9.1.8 Straightedging and Back-patching: Straightedge and back-patch after obtaining initial compaction and while the material is still hot.

330-9.2 Requirements Applicable to Courses Other Than Leveling:

330-9.2.1 Spreading and Finishing: Upon arrival, dump the mixture in the approved mechanical spreader, and immediately spread and strike-off the mixture to the full width required, and to such loose depth for each course that, when the work is completed, the required weight of mixture per square yard, or the specified thickness, is secured. Carry a uniform amount of mixture ahead of the screed at all times.

330-9.2.2 Thickness and Spread Rate of Layers: Construct each course of Type SP mixtures in layers of the thickness shown in Section 334.

When the deficiency of the average spread rate for the total course pavement thickness measured in accordance with 330-2.2 exceeds the following maximum spread rate tolerance, address the deficient area in accordance with 330-12.5.

1. Structural Course (non-friction)
 - a. For pavement of a design thickness of 2-1/2 inches or more: plus or minus 50 lbs per sy.
 - b. For pavement of a design thickness of less than 2-1/2 inches: plus or minus 25 lbs per sy.
2. Friction course
 - a. For open grade friction course: plus or minus 15 lbs per sy.
 - b. For dense grade friction course: plus or minus 25 lbs per sy.

As an exception, the Engineer may allow the Contractor to leave areas in place if it is determined by the Engineer that the deficiency is not a significant detriment to the pavement quality. A reduction to the pay item quantity will be made in accordance with 330-12.5.2.

330-9.2.3 Laying Width: If necessary due to the traffic requirements, lay the mixture in strips in such a manner as to provide for the passage of traffic. As an option, where the road is closed to traffic, lay the mixture to the full width with machines traveling in echelon.

330-9.2.4 Correcting Defects: Before starting any rolling, check the surface; correct any irregularities; remove all drippings, fat sandy accumulations from the screed, and fat spots from any source; and replace them with satisfactory material. Do not skin patch. When correcting a depression while the mixture is hot, scarify the surface and add fresh mixture.

330-9.3 Requirements Applicable Only to Leveling Courses:

330-9.3.1 Patching Depressions: Before spreading any leveling course, fill all depressions in the existing surface more than 1 inch deep by spot patching with leveling course mixture, and then compact them thoroughly.

330-9.3.2 Spreading Leveling Courses: Place all courses of leveling by the use of two motor graders, equip one with a spreader box. Use other types of leveling devices after they have been approved by the Engineer.

330-9.3.3 Rate of Application: When using Type SP-9.5 (fine graded) for leveling, do not allow the average spread of a layer to be less than 50 lb/yd² or more than 75 lb/yd². The quantity of mix for leveling shown in the plans represents the average for the entire project; however, the Contractor may vary the rate of application throughout the project as directed by the Engineer. When leveling in connection with base widening, the Engineer may require placing all the leveling mix prior to the widening operation.

330-9.3.4 Placing Leveling Course Over Existing Pavement: When the Contract Documents specify a leveling course to be placed over cracked concrete pavement, including existing concrete pavement covered with an asphalt surface, place the first layer of leveling course as soon as possible but no later than 48 hours after cracking the concrete.

330-9.3.5 Removal of Excess Joint Material: Where placing a leveling course over existing concrete pavement or bridge decks, trim the excess joint filler in the cracks and joints flush with the surface prior to placing the first layer of the leveling course.

330-10 Compacting Mixture.

330-10.1 Provisions Applicable to All Types:

330-10.1.1 Equipment and Sequence: For each paving operation, furnish a separate set of rollers, with their operators.

When density testing for acceptance is required, select equipment, sequence, and coverage of rolling to meet the specified density requirement. The coverage is the number of times the roller passes over a given area of pavement. Regardless of the rolling procedure used, complete the final rolling before the surface temperature of the pavement drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

When density testing for acceptance is not required, propose an alternative rolling pattern to be approved by the Engineer or use the following standard rolling procedure:

1. Seal (breakdown) Rolling: Provide two static coverages with a tandem steel-wheeled roller, weighing 5 to 15 tons, following as close behind the paver as possible without pick-up, undue displacement, or blistering of the material.

2. Intermediate rolling: Provide five static coverages with a pneumatic-tired roller, following as close behind the seal (breakdown) rolling operation as the mix will permit.

3. Final rolling: Provide one static coverage with a tandem steel-wheeled roller, weighing 5 to 15 tons, after completing the seal (breakdown) rolling and intermediate rolling, but before the surface pavement temperature drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

330-10.1.2 Rolling Procedures: Utilize procedures that will uniformly compact the pavement layer to the desired density level.

Roll across the mat, overlapping the adjacent pass by at least 6 inches. Roll slowly enough to avoid displacement of the mixture, and correct any displacement at once by the use of rakes and the addition of fresh mixture if required. Continue final rolling to eliminate all roller marks.

330-10.1.3 Compaction of Areas Inaccessible to Rollers: Use hand tamps or other satisfactory means to compact areas which are inaccessible to a roller, such as areas adjacent to curbs, gutters, bridges, manholes, etc.

330-10.1.4 Rolling Patching and Leveling Courses: Use pneumatic-tired rollers to roll all patching and leveling courses. When placing the initial leveling course over broken concrete pavement, use a pneumatic-tired roller that weighs at least 15 tons.

330-10.1.5 Correcting Defects: Do not allow the rollers to deposit gasoline, oil, or grease onto the pavement. Remove and replace any areas damaged by such deposits as directed by the Engineer. While rolling is in progress, test the surface continuously, and correct all discrepancies to comply with the surface requirements. Remove and replace all drippings, fat or lean areas, and defective construction of any description. Remedy depressions that develop before completing the rolling by loosening the mixture and adding new mixture to bring the depressions to a true surface. Should any depression remain after obtaining the final compaction, remove the full depth of the mixture, and replace it with sufficient new mixture to form a true and even surface. Correct all high spots, high joints, and honeycombing as directed by the Engineer. Remove and replace any mixture remaining unbonded after rolling. Correct all defects prior to laying the subsequent course.

330-10.1.6 Use of Traffic Roller on First Overbuild Course: Use a pneumatic-tired roller on the first overbuild course. Compact the pavement with a minimum of five coverages.

330-10.1.7 Use of Traffic Roller or Vibratory Roller on First Structural Layer Placed on an Asphalt Rubber Membrane Interlayer (ARMI): Use a pneumatic-tired roller or a vibratory roller on the first structural layer placed on an ARMI.

330-10.1.8 Compaction at Bridge Structures: Compact asphalt mixtures placed over bridge decks and approach slabs using static compaction only. Utilize the standard rolling procedure described in 330-10.1.1 or an alternative procedure approved by the Engineer.

330-11 Joints.

330-11.1 Transverse Joints: Place the mixture as continuously as possible. Do not pass the roller over the unprotected end of the freshly laid mixture except when discontinuing the laying operation long enough to permit the mixture to become chilled. When thus interrupting the laying operation, construct a transverse joint by cutting back on the previous run to expose the full depth of the mat.

330-11.2 Longitudinal Joints: For all layers of pavement except the leveling course, place each layer so that longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. Plan offsets in advance so that longitudinal joints of the friction course are not in wheel path areas. The longitudinal joints for friction course layers should be within 6 inches of the lane edge or at the center of the lane. The Engineer may waive this requirement where offsetting is not feasible due to the sequence of construction.

330-11.3 General: When laying fresh mixture against the exposed edges of joints (trimmed or formed as provided above), place it in close contact with the exposed edge to produce an even, well-compacted joint after rolling.

330-11.4 Placing Asphalt Next to Concrete Pavement: When placing asphalt next to concrete pavement, construct the joint in accordance with Section 350.

330-12 Surface Requirements.

330-12.1 General: Construct a smooth pavement with good surface texture and the proper cross-slope.

330-12.2 Texture of the Finished Surface of Paving Layers: Produce a finished surface of uniform texture and compaction with no pulled, torn, raveled, crushed or loosened portions and free of segregation, bleeding, flushing, sand streaks, sand spots, or ripples. Address any pavement not meeting the requirements of this specification in accordance with 330-12.5.

Do not use asphalt concrete mixtures containing aggregates that cause a different color appearance in the final wearing surface unless the section is greater than or equal to one mile in length and across the full width of the pavement, including shoulders and turn lanes. Exceptions to these requirements will be permitted if approved by the Engineer.

330-12.3 Cross Slope: Construct a pavement surface with cross slopes in compliance with the requirements of the Contract Documents. Furnish an electronic level with a length of 4 feet and an accuracy of 0.1 degree, approved by the Engineer for the control of cross slope. Make this electronic level available at the jobsite at all times during paving operations.

330-12.3.1 Quality Control Requirements: Calibrate the electronic levels a minimum of once per day before any paving operation, in accordance with manufacturer's instructions.

Compare the Quality Control level with the Verification level before any paving operation, and at any time directed by the Engineer.

Measure the cross slope of the compacted pavement surface by placing the level at the center location of a lane and perpendicular to the roadway centerline. Record all the measurements to the nearest 0.1% on an approved form and submit to the Engineer for documentation.

1. Tangent Sections: Measure the cross slope per lane at a minimum frequency of one measurement every 100 feet. Calculate the absolute deviation of cross slope at each measurement and then average the absolute deviation of ten consecutive cross slope measurements. The absolute deviation is the positive value of a deviation. When the average absolute deviation cross slope is consistently within the acceptance tolerance as shown in Table 330-2 and upon the approval of the Engineer, the frequency of the cross slope measurements can be reduced to one measurement every 200 feet during paving operations.

2. Superelevated Sections: Measure the cross slope every 100 feet per lane within the length of full superelevation. Calculate the absolute deviation of each measurement and then average the absolute deviation of ten consecutive cross slope measurements. For every transition section, measure the cross slope at control points identified in the plans, or if not shown in the plans, at a control point at the location of 0.0% cross slope and calculate the absolute deviation. For curves where the length of full superelevation is less than 250 feet, measure the cross slope at the beginning point, midpoint and ending point of the fully superelevated sections, calculate the absolute deviation, and average. When the number of measurements is less than ten and the length of full superelevation is greater than 250 feet, average the absolute deviation of all measurements.

If the average absolute deviation of the cross slope measurements falls outside the acceptance tolerance, as shown in Table 330-2, stop the paving operations and make adjustments until the problem is resolved to the satisfaction of the Engineer. If an individual cross slope deviation falls outside the acceptance tolerance as shown in Table 330-2, make corrections in accordance with 330-12.5 only to cover the deficient area for the structural course at no cost to the Department. For pavement with multiple layers, the deficient areas for the structural course may be left in place, upon the approval of the Engineer. Complete corrections before placement of the final design surface layer (Type SP layer or friction course layer), unless stated otherwise in the plans, or as determined by the Engineer. For friction course layers, make corrections in accordance with 330-12.5.

The limits of deficient areas requiring correction may be verified and adjusted with more accurate measurement methods, including survey instruments, upon approval by the Engineer at no cost to the Department.

Should the Contractor wish to have any corrections waived, submit a request to the Engineer for approval. The Engineer may waive the corrections at no reduction in payment if the deficiencies are sufficiently separated so as not to affect the overall traffic safety, surface drainage and ride quality characteristics of the pavement and the corrective action would unnecessarily mar the appearance of the finished pavement.

For intersections, tapers, crossovers, transitions at the beginning and end of the project, bridge approaches and similar areas, adjust the cross slope to match the actual site conditions, or as directed by the Engineer.

Table 330-2 Cross Slope Acceptance Tolerance		
Roadway Feature	Individual Absolute Deviation	Average Absolute Deviation
Tangent section (including turn lanes)	0.4%	0.2%
Superelevated curve	0.4%	0.2%
Shoulder	0.5%	0.5%

In the event that the distance between two edges of deficient areas is less than 100 feet, the correction work shall include the area between the deficient sections.

330-12.3.2 Verification: The Engineer will verify the Contractor's cross slope measurements by randomly taking a minimum of ten cross slope measurements per lane per mile in tangent sections, control points in transition sections, and a minimum of three cross slope measurements on fully superelevated sections over a day's production. The Engineer will measure the cross slope of the compacted pavement surface by placing the level at the center location of a lane and perpendicular to the roadway centerline. If the average absolute deviation or an individual cross slope deviation falls outside of the acceptance tolerance as shown in Table 330-2, immediately make a comparison check at the QC test locations to verify the QC measurements in the questionable section. If the comparisons are beyond the acceptable comparison tolerance in accordance with 330-12.3.1, stop the paving operations until the problem is resolved to the satisfaction of the Engineer. Correct any cross slope not meeting the individual deviation acceptance tolerance in accordance with 330-12.5 at no cost to the Department. The Engineer reserves the right to check the pavement cross slope at any time by taking cross slope measurements at any location.

330-12.4 Pavement Smoothness: Construct a smooth pavement meeting the requirements of this Specification.

330-12.4.1 General: Furnish a 15 foot manual and a 15 foot rolling straightedge meeting the requirements of FM 5-509. Obtain a smooth surface on all pavement courses placed, and then straightedge all layers as required by this specification.

330-12.4.2 Test Method: Perform all straightedge testing in accordance with FM 5-509 in the outside wheel path of each lane. The Engineer, or these specifications, may require additional testing at other locations within the lane.

330-12.4.3 Traffic Control: Provide traffic control in accordance with Section 102 and the Design Standards Index Nos. 607 or 619 during all testing. When traffic control cannot be provided in accordance with Index Nos. 607 or 619, submit an alternative Traffic Control Plan as specified in 102-4. Include the cost of this traffic control in the Contract bid prices for the asphalt items.

330-12.4.4 Process Control Testing: Assume full responsibility for controlling all paving operations and processes such that the requirements of these Specifications are met at all times. Address in the QC Plan the methods to be used to control smoothness.

330-12.4.5 Quality Control Testing:

330-12.4.5.1 General: Straightedge the final Type SP structural layer and friction course layer in accordance with 330-12.4.2, regardless of whether the method of acceptance is by straightedge or laser profiler. Test all pavement lanes and ramps where the width is constant and document all deficiencies in excess of 3/16 inch on a form approved by the Engineer.

330-12.4.5.2 Straightedge Exceptions: Straightedge testing will not be required in the following areas: shoulders, intersections, tapers, crossovers, parking lots and similar areas, or in the following areas when they are less than 250 feet in length: turn lanes, acceleration/deceleration lanes and side streets.

As an exception, in the event the Engineer identifies a surface irregularity in the above areas that is determined to be objectionable, straightedge and address all deficiencies in excess of 3/8 inch in accordance with 330-12.5.

The Engineer may waive straightedge requirements for transverse joints at the beginning and end of the project, at the beginning and end of bridge structures, at manholes, and at utility structures if the deficiencies are caused by factors beyond the control of the Contractor, as determined by the Engineer. In addition, the Engineer may also waive the straightedging requirements on ramps and superelevated sections where the geometrical orientation of the pavement results in an inaccurate measurement with the rolling straightedge.

330-12.4.5.3 Intermediate Layers and Temporary Pavement: When the design speed is 55 mph or greater and the intermediate Type SP layer or temporary pavement is to be opened to traffic, if the Engineer identifies a surface irregularity that is determined to be objectionable, straightedge and address all deficiencies in excess of 3/8 inch within 72 hours of placement in accordance with 330-12.5.

330-12.4.5.4 Final Type SP Structural Layer: Straightedge the final Type SP structural layer in accordance with 330-12.4.2, either behind the final roller of the paving train or as a separate operation. Notify the Engineer of the location and time of straightedge testing a minimum of 48 hours before beginning testing. The Engineer will verify the straightedge testing by observing the Quality Control straight edging operations. Address all deficiencies in excess of 3/16 inch in accordance with 330-12.5.

When the final structural course is to be opened to traffic and the design speed is 55 mph or greater, if any defect is 3/8 inch or greater, the Engineer may require deficiencies to be corrected within 72 hours after opening to traffic.

For bicycle paths, straightedge the final Type SP structural layer with a rolling straightedge, either behind the final roller of the paving train or as a separate operation. Address all deficiencies in excess of 5/16 inch in accordance with 330-12.5. If the Engineer determines that the deficiencies on the bicycle path are due to field geometrical conditions, the Engineer will waive corrections with no deduction to the pay item quantity.

330-12.4.5.5 Friction Course Layer: Straightedge the friction course layer in accordance with 330-12.4.2, either behind the final roller of the paving train or as a separate operation upon completion of all paving operations. Notify the Engineer of the location and time of straightedge testing a minimum of 48 hours before beginning testing. The Engineer will verify the straightedge testing by observing the Quality Control straightedging operations. Address all deficiencies in excess of 3/16 inch in accordance with 330-12.5. For laser acceptance, corrections may be made either before or after laser acceptance testing.

330-12.4.6 Acceptance:

330-12.4.6.1 Straightedge Acceptance: For areas of roadways where the design speed is less than 55 miles per hour, acceptance for pavement smoothness of the friction course will be based on verified Quality Control measurements using the straightedge as required by 330-12.4.5. The Engineer will verify the straightedge testing by observing the Quality Control straightedging operations.

330-12.4.6.2 Laser Acceptance: For areas of high speed roadways where the design speed is equal to or greater than 55 miles per hour, acceptance testing for pavement smoothness of the friction course (for mainline traffic lanes only) will be based on the Laser Profiler. Ramps, acceleration and deceleration lanes, and other areas not suitable for testing with the Laser Profiler will be tested and accepted with the straightedge in accordance with 330-12.4.5.5 and 330-12.4.6.1.

The pavement smoothness of each lane will be determined by a Laser Profiler furnished and operated by the Department in accordance with FM 5-549 and a report issued with the Ride Number (RN) reported to one decimal place. If corrections are made, as required following Laser Acceptance, the pavement will not be retested for smoothness using the Laser Profiler.

For this testing, the pavement will be divided into 0.1 mile segments. Partial segments equal to or greater than 0.01 mile will be considered as a 0.1 mile segment. The pavement will be accepted as follows:

1) For segments with a RN greater than or equal to 4.0, the pavement will be accepted at full pay.

2) For segments with a RN less than 4.0, the Engineer will further evaluate the data in 0.01 mile intervals for both wheel paths.

If the RN is 3.5 or above for all 0.01 mile intervals in both wheel paths, the segment will be accepted at full payment.

If the RN is less than 3.5 for one or more 0.01 mile intervals, the segment will be tested with the rolling straightedge in both wheel paths in accordance with FM 5-509. If approved by the Engineer, this straightedging may be completed (in both wheel paths) as part of the Quality Control straightedging operations described in 330-12.4.5.5, prior to testing with the laser profiler. Notify the Engineer of the location and time of

straightedge testing a minimum of 48 hours before beginning testing. The Engineer will verify the straightedge testing by observing the Quality Control straightedging operations. Address all deficiencies in excess of 3/16 inch in accordance with 330-12.5.

Test and accept areas at the beginning and ending of the project, bridge approaches and departures, and areas where the segment is less than 0.01 mile, with the straightedge in accordance with 330-12.4.5.5 and 330-12.4.6.1.

330-12.5 Unacceptable Pavement:

330-12.5.1 Corrections: Address all areas of unacceptable pavement at no cost to the Department. Retest all corrected areas and assure the requirements of these specifications are met.

330-12.5.1.1 Structural Layers: Correct all deficiencies, as defined in these Specifications, in the Type SP structural layers by one of the methods described below:

a. Remove and replace the full depth of the layer, extending a minimum of 50 feet on both sides (where possible) of the defective area for the full width of the paving lane.

b. Mill the pavement surface to a depth and width that is adequate to remove the deficiency. (This option only applies if the structural layer is not the final surface layer.)

330-12.5.1.2 Friction Course: Correct deficiencies in the friction course or final surface layer by removing and replacing the full depth of the layer, extending a minimum of 50 feet on both sides (where possible) of the defective area for the full width of the paving lane. As an exception, the Engineer may allow the contractor to leave these areas in place at if it is determined by the Engineer that the deficiency is not a significant detriment to the pavement quality. A reduction to the pay item quantity will be made in accordance with 330-12.5.2.

330-12.5.2 Reduction in Pay Item Quantity: When the Engineer elects to waive corrections, the Department will reduce the pay quantity for the pay item in question by the amount of material that the Contractor would have removed and replaced had the correction been made. When the pay quantity is in tons, the Department will base the reduction on the volume of material that the Contractor would have removed (the length by the lane width by layer thickness) multiplied by the maximum specific gravity of the mix as determined through the following equation:

$$\text{Quantity (tons)} = L \times W \times t \times G_{mm} \times 0.0024$$

Where: L = Lane length (ft.)

W = Lane width (ft.)

t = Layer thickness (in.)

G_{mm} = Maximum specific gravity from verified mix design

For FC-5 open-graded friction course, the Department will base the reduction on the area that the Contractor would have removed (the length by lane width) multiplied by a spread rate of 80 lb/yd² as determined through the following equation:

$$\text{Quantity (tons)} = L \times W \times 0.0044$$

Where: L = Lane length (ft.)

W = Lane width (ft.)

330-13 Protection of Finished Surface.

Keep sections of newly compacted asphalt concrete, which are to be covered by additional courses, clean until the successive course is laid.

Do not dump embankment or base material directly on the pavement. Dress shoulders before placing the friction course on adjacent pavement.

Equip blade graders operating adjacent to the pavement during shoulder construction with a 2 inch by 8 inch or larger board, or other attachment providing essentially the same results, attached to their blades in such manner that it extends below the blade edge in order to protect the pavement surface from damage by the grader blade.

To prevent rutting or other distortion, protect sections of newly finished dense-graded friction course and the last structural layer prior to the friction course from traffic until the surface temperature has cooled below 160°F.

The Contractor may use artificial methods to cool the pavement to expedite paving operations. The Department may direct the Contractor to use artificial cooling methods when maintenance of traffic requires opening the pavement to traffic at the earliest possible time.

334 SUPERPAVE ASPHALT CONCRETE. (REV 7-29-10) (FA 8-16-10) (1-11)

SECTION 334 (Pages 265-291) is deleted and the following substituted:

SECTION 334 SUPERPAVE ASPHALT CONCRETE

334-1 Description.

334-1.1 General: Construct a Superpave Asphalt Concrete pavement with the type of mixture specified in the Contract, or when offered as alternates, as selected. Superpave mixes are identified as Type SP-9.5, Type SP-12.5 or Type SP-19.0.

Meet the requirements of Section 320 for plant and equipment. Meet the general construction requirements of Section 330, except as modified herein, including the provision for Quality Control Plans and Quality Control Systems as specified in Section 105.

334-1.2 Traffic Levels: The requirements for Type SP Asphalt Concrete mixtures are based on the design traffic level of the project, expressed in 18,000 pound Equivalent Single Axle Loads (ESAL's). The five traffic levels are as shown in Table 334-1.

Table 334-1 Superpave Traffic Levels	
Traffic Level	Traffic Level (1x10 ⁶ ESAL's)
A	<0.3
B	0.3 to <3
C	3 to <10
D	10 to <30
E	≥30

The traffic level(s) for the project are as specified in the Contract. A Type SP mix one traffic level higher than the traffic level specified in the Contract may be substituted, at no cost to the Department (i.e. Traffic Level B may be substituted for Traffic Level A, etc.).

334-1.3 Gradation Classification: The Superpave mixes are classified as either coarse or fine, depending on the overall gradation of the mixture. Coarse and fine mixes are defined in 334-3.2.2.

The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:

Type SP-9.5.....	9.5 mm
Type SP-12.5.....	12.5 mm
Type SP-19.0.....	19.0 mm

334-1.4 Thickness: The total thickness of the Type SP asphalt layer(s) will be the plan thickness as shown in the Contract Documents. Before paving, propose a thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan thickness. For construction purposes, the plan thickness and individual layer thickness will be converted to spread rate based on the maximum specific gravity of the asphalt mix being used, as well as the minimum density level, as shown in the following equation:

$$\text{Spread rate (lbs/yd}^2\text{)} = t \times G_{mm} \times 43.3$$

Where: t = Thickness (in.) (Plan thickness or individual layer thickness)

G_{mm} = Maximum specific gravity from the verified mix design

The weight of the mixture shall be determined as provided in 320-2.2. For target purposes only, spread rate calculations should be rounded to the nearest whole number.

Note: Plan quantities are based on a G_{mm} of 2.540, corresponding to a spread rate of 110 lbs/yd²-in. Pay quantities will be based on the actual maximum specific gravity of the mix being used.

334-1.4.1 Layer Thicknesses - Fine Mixes: The allowable layer thicknesses for fine Type SP Asphalt Concrete mixtures are as follows:

Type SP-9.5.....	1 - 1 1/2 inches
Type SP-12.5.....	1 1/2 - 2 1/2 inches
Type SP-19.0.....	2 - 3 inches

In addition to the minimum and maximum thickness requirements, the following restrictions are placed on fine mixes when used as a structural course:

Type SP-9.5 - Limited to the top two structural layers, two layers maximum.

Type SP-9.5 – May not be used on Traffic Level D and E applications.

Type SP-19.0 - May not be used in the final (top) structural layer.

334-1.4.2 Layer Thicknesses - Coarse Mixes: The allowable layer thicknesses for coarse Type SP Asphalt Concrete mixtures are as follows:

Type SP-9.5.....	1 1/2 - 2 inches
Type SP-12.5.....	2 - 3 inches
Type SP-19.0.....	3 - 3 1/2 inches

In addition to the minimum and maximum thickness requirements, the following restrictions are placed on coarse mixes when used as a structural course:

Type SP-19.0 - May not be used in the final (top) structural layer.

334-1.4.3 Additional Requirements: The following requirements also apply to coarse and fine Type SP Asphalt Concrete mixtures:

1. A minimum 1 1/2 inch initial lift is required over an Asphalt Rubber Membrane Interlayer (ARMI).
2. When construction includes the paving of adjacent shoulders (≤ 5 feet wide), the layer thickness for the upper pavement layer and shoulder must be the same and paved in a single pass, unless called for differently in the Contract Documents.
3. All overbuild layers must be fine Type SP Asphalt Concrete designed at the traffic level as stated in the Contract. Use the minimum and maximum layer thicknesses as specified above unless called for differently in the Contract Documents. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/2 inch, and the maximum allowable thickness may be increased 1/2 inch, unless called for differently in the Contract Documents.

334-2 Materials.

334-2.1 General Requirements: Meet the material requirements specified in Division III. Specific references are as follows:

Superpave PG Asphalt Binder or	
Recycling Agent.....	916-1, 916-2
Coarse Aggregate.....	Section 901
Fine Aggregate.....	Section 902

334-2.2 Superpave Asphalt Binder: Unless specified otherwise in the Contract, use a PG 67-22 asphalt binder. In addition, meet the requirements of 334-2.3.

334-2.3 Reclaimed Asphalt Pavement (RAP) Material:

334-2.3.1 General requirements: RAP may be used as a component of the asphalt mixture subject to the following requirements:

1. When using a PG 76-22 Asphalt Binder, limit the amount of RAP material used in the mix to a maximum of 20 percent by weight of total aggregate. As an exception, amounts greater than 20 percent RAP by weight of total aggregate can be used if no more than 20 percent by weight of the total asphalt binder comes from the RAP material.
2. Assume full responsibility for the design, production and construction of asphalt mixes which incorporate RAP as a component material.
3. Use RAP from an FDOT approved stockpile or RAP that has an FDOT furnished Pavement Composition Data Sheet.
4. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.
5. Provide RAP material having a minimum average asphalt binder content of 4.0 percent by weight of RAP. As an exception, when using fractionated RAP, the minimum average asphalt binder content for the coarse portion of the RAP shall be 2.5 percent by weight of the coarse portion of the RAP. The coarse portion of the RAP shall be the portion of

the RAP retained on the No. 4 sieve. The Engineer may sample the stockpile(s) to verify that this requirement is met.

334-2.3.2 Material Characterization for Mix Design: Assume responsibility for establishing the asphalt binder content, gradation, viscosity and bulk specific gravity (G_{sb}) of the RAP material based on a representative sampling of the material by roadway cores or stockpile samples. For roadway core samples, assume responsibility for the degradation that will occur during the milling operation.

334-2.3.3 RAP Stockpile Approval: Prior to the incorporation of RAP into the asphalt mixture, stockpile the RAP material and obtain approval for the stockpile by one of the following methods:

1. Continuous stockpile: When RAP is obtained from one or multiple sources and is either processed, blended, or fractionated, and stockpiled in a continuous manner, assure an adequate number of test results are obtained for stockpile approval. Test the RAP material for gradation and asphalt content at a minimum frequency of 1 sample per 1000 tons with a minimum of six test results. Test the RAP material for G_{mm} (for G_{sb} determination) and for recovered viscosity at a minimum frequency of 1 sample per 5000 tons with a minimum of two test results. Based on visual inspection and a review of the test data, the Engineer will determine the suitability of the stockpiled material. In addition, address in the QC Plan the details and specifics of the processing, sampling, testing and actions to be taken.

2. Non-continuous single stockpile: When an individual stockpile is being constructed, obtain representative samples at random locations and test the RAP material for gradation and asphalt content at a minimum frequency of 1 sample per 1000 tons with a minimum of six test results. Test the RAP material for G_{mm} (for G_{sb} determination) and for recovered viscosity at a minimum frequency of 1 sample per 5000 tons with a minimum of two test results. Based on visual inspection and a review of the test data, the Engineer will determine the suitability of the stockpiled material. Once the RAP stockpile has been approved, do not add additional material without prior approval of the Engineer.

Determine the asphalt binder content and gradation of the RAP material in accordance with FM 5-563 and FM 1-T 030, respectively. Extract and recover the asphalt binder from the RAP in accordance with FM 5-524 and FM 3-D 5404, respectively. Determine the viscosity of the recovered asphalt binder in accordance with ASTM D 2171. Establish the G_{sb} of the RAP material by using one of the following methods:

a. Calculate the G_{sb} value based upon the effective specific gravity (G_{se}) of the RAP material, determined on the basis of the asphalt binder content and maximum specific gravity (G_{mm}) of the RAP material. The Engineer will approve the estimated asphalt binder absorption value used in the calculation.

b. Measure the G_{sb} of the RAP aggregate, in accordance with FM 1-T 084 and FM 1-T 085. Obtain the aggregate by using a solvent extraction method.

334-2.3.4 Pavement Composition: When the Contract includes milling of the existing asphalt pavement, the Pavement Composition Data Sheet may be available on the Department's website. The URL for obtaining this information, if available, is: www.dot.state.fl.us/statematerialsoffice/laboratory/asphalt/centrallaboratory/compositions/index.shtm.

334-2.3.5 Asphalt Binder for Mixes with RAP: Select the appropriate asphalt binder grade based on Table 334-2. The Engineer reserves the right to change the asphalt binder type and grade at design based on the characteristics of the RAP asphalt binder, and reserves the

right to make changes during production. Maintain the viscosity of the recycled mixture within the range of 5,000 to 15,000 poises. Obtain a sample of the mixture for the Engineer within the first 1,000 tons of production and at a continuing frequency of one sample per 4,000 tons of mix.

Table 334-2 Asphalt Binder Grade for Mixes Containing RAP	
Percent RAP	Asphalt Binder Grade
<20	PG 67-22
20 – 29	PG 64-22
≥ 30	Recycling Agent

334-2.4 Recycled Crushed Glass: Recycled crushed glass may be used as a component of the asphalt mixture subject to the following requirements:

1. Consider the recycled crushed glass a local material and meet all requirements specified in 902-6.

2. Limit the amount of recycled crushed glass to a maximum of 15 percent by weight of total aggregate.

3. Use an asphalt binder that contains a minimum of 0.5 percent anti-stripping agent by weight of binder. The antistrip additive shall be one of the products included on the Qualified Products List specified in 6-1 of the Specifications. The antistrip additive shall be introduced into the asphalt binder by the supplier during loading.

4. Do not use recycled crushed glass in friction course mixtures or in structural course mixtures which are to be used as the final wearing surface.

334-3 General Composition of Mixture.

334-3.1 General: Compose the asphalt mixture using a combination of aggregate (coarse, fine or mixtures thereof), mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the mix design. Aggregates from various sources may be combined.

334-3.2 Mix Design:

334-3.2.1 General: Design the asphalt mixture in accordance with AASHTO R35-04, except as noted herein. Prior to the production of any asphalt mixture, submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. For Traffic Level B through E mix designs, include representative samples of all component materials, including asphalt binder. Allow the State Materials Engineer a maximum of four weeks to either conditionally verify or reject the mix as designed.

Do not use more than three mix designs per nominal maximum aggregate size per traffic level per binder grade per contract year. Exceeding this limitation will result in a maximum Composite Pay Factor of 1.00 as defined in 334-8.2 for all designs used beyond this limit.

Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, if available, is:

<http://www.dot.state.fl.us/Specificationsoffice/implemented/URLinSpecs/files/WarmMixAsphalt.pdf>.

The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and the Engineer will no longer allow the use of the mix design.

334-3.2.2 Mixture Gradation Requirements: Combine the coarse and fine aggregate in proportions that will produce an asphalt mixture meeting all of the requirements defined in this specification and conform to the gradation requirements at design as defined in AASHTO M323-07, Table 3. Aggregates from various sources may be combined.

334-3.2.2.1 Mixture Gradation Classification: Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M323-07, Table-3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M323-07, Table 4. Coarse mixes are defined as having a combined aggregate gradation that passes below the primary control sieve control point and below the maximum density line for all sieve sizes smaller than the primary control sieve. Fine mixes are defined as having a gradation that passes above the primary control sieve control point and above the maximum density line for all sieve sizes smaller than the primary control sieve and larger than the #100 sieve. Use a fine mix for Traffic Levels A through C; use either a coarse mix or fine mix for Traffic Levels D and E.

334-3.2.3 Aggregate Consensus Properties: For Traffic Level C through E mixtures, meet the following consensus properties at design for the aggregate blend. Aggregate consensus properties do not apply to Traffic Level A and B mixtures.

334-3.2.3.1 Coarse Aggregate Angularity: When tested in accordance with ASTM D 5821, meet the percentage of fractured faces requirements specified in AASHTO M 323-07, Table 5.

334-3.2.3.2 Fine Aggregate Angularity: When tested in accordance with AASHTO T 304, Method A, meet the uncompacted void content of fine aggregate specified in AASHTO M 323-07, Table 5.

334-3.2.3.3 Flat and Elongated Particles: When tested in accordance with ASTM D 4791, (with the exception that the material passing the 3/8 inch sieve and retained on the No. 4 sieve shall be included), meet the requirements specified in AASHTO M 323-07, Table 5. Measure the aggregate using the ratio of 5:1, comparing the length (longest dimension) to the thickness (shortest dimension) of the aggregate particles.

334-3.2.3.4 Sand Equivalent: When tested in accordance with AASHTO T 176, meet the sand equivalent requirements specified in AASHTO M 323-07, Table 5.

334-3.2.4 Gyratory Compaction: Compact the design mixture in accordance with AASHTO T 312-08, with the following exception: use the number of gyrations at N_{design} as defined in Table 334-3. Measure the inside diameter of gyratory molds in accordance with FM 5-585.

Table 334-3 Gyratory Compaction Requirements	
Traffic Level	N_{design} Number of Gyrations
A	50
B	65
C	75

Table 334-3 Gyratory Compaction Requirements	
Traffic Level	N _{design} Number of Gyration
D	100
E	100

334-3.2.5 Design Criteria: Meet the requirements for nominal maximum aggregate size as defined in AASHTO M323-07, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M323-07, Table 6. Use a dust-to-binder ratio of 0.8 to 1.6 for coarse mixes. N_{maximum} requirements are not applicable for Traffic Level A and B mixtures.

334-3.2.6 Moisture Susceptibility:

1. For Traffic Level A and B mixtures, use a liquid anti-strip additive, which is on the Department's Qualified Products List, at a rate of 0.5% by weight of the asphalt binder. Other rates of anti-strip additive may be used upon approval of the Engineer.

2. For Traffic Level C through E mixtures, test 4 inch specimens in accordance with FM 1-T 283. Provide a mixture having a retained tensile strength ratio of at least 0.80 and a minimum tensile strength (unconditioned) of 100 psi. If necessary, add a liquid anti-stripping agent, which is on the Department's Qualified Products List or hydrated lime (meeting the requirements of Section 337) in order to meet these criteria.

334-3.2.7 Additional Information: In addition to the requirements listed above, provide the following information with each proposed mix design submitted for verification:

1. The design traffic level and the design number of gyrations (N_{design}).
2. The source and description of the materials to be used.
3. The DOT source number and the DOT product code of the aggregate components furnished from a DOT approved source.
4. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.
5. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.
6. The bulk specific gravity (G_{sb}) value for each individual aggregate and RAP component, as identified in the Department's aggregate control program.
7. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1 percent.
8. A target temperature for the mixture at the plant (mixing temperature) and a target temperature for the mixture at the roadway (compaction temperature) in accordance with 330-6.3. Do not exceed a target temperature of 330°F for PG 76-22 asphalt binders, 320°F for ARB-12 asphalt binders, and 315°F for ARB-5 and unmodified asphalt binders.
9. Provide the physical properties achieved at four different asphalt binder contents. One of which shall be at the optimum asphalt content, and must conform to all specified physical requirements.
10. The name of the CTQP Qualified Mix Designer.
11. The ignition oven calibration factor.

12. The warm mix technology, if used.

334-3.3 Mix Design Revisions: During production, the Contractor may request a target value revision to a mix design, subject to meeting the following requirements: (1) the target change falls within the limits defined in Table 334-4, (2) appropriate data exists demonstrating that the mix complies with production air voids specification criteria, and (3) the mixture gradation meets the basic gradation requirements defined in 334-3.2.2.

Table 334-4 Limits for Potential Adjustments to Mix Design Target Values	
Characteristic	Limit from Original Mix Design
No. 8 sieve and Coarser	± 5.0 percent
No. 16 sieve	± 4.0 percent
No. 30 sieve	± 4.0 percent
No. 50 sieve	± 3.0 percent
No. 100 sieve	± 3.0 percent
No. 200 sieve	± 1.0 percent
Asphalt Binder Content ⁽¹⁾	± 0.3 percent
Each Component of Aggregate Blend ⁽²⁾	± 5.0 percent
⁽¹⁾ Reductions to the asphalt binder content will not be permitted if the VMA during production is lower than 1.0 percent below the design criteria.	
⁽²⁾ Revisions to FC-5 mixtures to be determined by the Engineer.	

Submit all requests for revisions to mix designs, along with supporting documentation, to the Engineer. In order to expedite the revision process, the request for revision or discussions on the possibility of a revision may be made verbally, but must be followed up by a written request. The verified mix design will remain in effect until the Engineer authorizes a change. In no case will the effective date of the revision be established earlier than the date of the first communication between the Contractor and the Engineer regarding the revision.

A new design mix will be required if aggregate sources change, or for any substitution of an aggregate product with a different aggregate code, unless approved by the Engineer.

334-4 Contractor Process Control.

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and roadway for process control purposes. Enter all Process Control test data into the Department's Laboratory Information Management System (LIMS) database. The Engineer will not use these test results in the acceptance payment decision.

Address in the Quality Control Plan how Process Control failures will be handled. When a Process Control failure occurs, investigate, at a minimum, the production process, testing equipment and/or sampling methods to determine the cause of the failure, and make any necessary changes to assure compliance with these Specifications. Obtain a follow up sample immediately after corrective actions are taken to assess the adequacy of the corrections. In the event the follow-up Process Control sample also fails to meet Specification requirements, cease production of the asphalt mixture until the problem is adequately resolved to the satisfaction of the Quality Control Manager.

334-5 Acceptance of the Mixture.

334-5.1 General: The mixture will be accepted at the plant with respect to gradation (P_{-8} and P_{-200}), asphalt content (P_b), and volumetrics (volumetrics is defined as air voids at N_{design}). The mixture will be accepted on the roadway with respect to density of roadway cores. Acceptance will be on a LOT-by-LOT basis (for each mix design) based on tests of random samples obtained within each subplot taken at a frequency of one set of samples per subplot. A roadway LOT and a plant production LOT shall be the same. Acceptance of the mixture will be based on Contractor Quality Control test results that have been verified by the Department.

334-5.1.1 Sampling and Testing Requirements: Obtain the samples in accordance with FM 1-T 168. Obtain samples at the plant of a sufficient quantity to be split into three smaller samples; one for Quality Control, one for Verification and one for Resolution testing; each sample at approximately 35 pounds. The split samples for Verification testing and Resolution testing shall be reduced in size and stored in three boxes each. The approximate size of each box must be 12 inches x 8 inches x 4 inches. Provide, label and safely store sample boxes in a manner agreed upon by the Engineer for future testing.

The asphalt content of the mixture will be determined in accordance with FM 5-563. In the event the FM 5-563 ignition oven goes out of service during production, the Contractor may elect to use a replacement oven at another location for no more than 72 hours while the oven is being repaired. The gradation of the recovered aggregate will be determined in accordance with FM 1-T 030. Volumetric testing will be in accordance with AASHTO T 312-08 and FM 1-T 209. Measure the inside diameter of gyratory molds in accordance with FM 5-585. Prior to testing volumetric samples, condition the test-sized sample for one hour plus or minus five minutes at the target roadway compaction temperature in a covered, shallow, flat pan, such that the mixture temperature at the end of the one hour conditioning period is within plus or minus 20°F of the roadway compaction temperature. Test for roadway density in accordance with FM 1-T 166.

334-5.1.2 Acceptance Testing Exceptions: When the total combined quantity of hot mix asphalt for the project, as indicated in the plans for Type SP and Type FC mixtures only, is less than 2000 tons, the Engineer will accept the mix on the basis of visual inspection. The Engineer may require the Contractor to run process control tests for informational purposes, as defined in 334-4, or may run independent verification tests to determine the acceptability of the material.

Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, open-graded friction courses, variable thickness overbuild courses, leveling courses, any asphalt layer placed on subgrade (regardless of type), miscellaneous asphalt pavement, or any course with a specified thickness less than 1 inch or a specified spread rate that converts to less than 1 inch as described in 334-1.4. Density testing for acceptance will not be performed on asphalt courses placed on bridge decks or approach slabs; compact these courses in static mode only per the requirements of 330-10.1.8. In addition, density testing for acceptance will not be performed on the following areas when they are less than 1,000 feet (continuous) in length: crossovers, intersections, turning lanes, acceleration lanes, deceleration lanes, shoulders, parallel parking lanes or ramps.

Where density testing for acceptance is not required, compact these courses (with the exception of open-graded friction courses) in accordance with the rolling procedure (equipment and pattern) as approved by the Engineer or with Standard Rolling Procedure as specified in 330-10.1.2. In the event that the rolling procedure deviates from the

procedure approved by the Engineer, or the Standard Rolling Procedure, placement of the mix shall be stopped.

The density pay factor (as defined in 334-8.2) for LOTs where there are areas not requiring density testing for acceptance will be prorated based on a pay factor of 1.00 for the quantity (tonnage) of material in areas not requiring density testing for acceptance and the actual pay factor for the tonnage of material in areas requiring density testing.

334-5.2 Full LOTs: Each LOT will be defined (as selected by the Contractor prior to the start of the LOT) as either (1) 2,000 tons, with each LOT subdivided into four equal sublots of 500 tons each, or (2) 4,000 tons, with each LOT subdivided into four equal sublots of 1,000 tons each. As an exception to this, the initial LOT of all new mix designs shall be defined as 2,000 tons, subdivided into four equal sublots of 500 tons each. Before the beginning of a LOT, the Engineer will develop a random sampling plan for each subplot and direct the Contractor on sample points, based on tonnage, for each subplot during construction.

334-5.3 Partial LOTs: A partial LOT is defined as a LOT size that is less than a full LOT. A partial LOT may occur due to the following:

1. The completion of a given mix type or mix design on a project.
2. Closure of the LOT due to time. LOTs will be closed 30 calendar days after the start of the LOT. Time periods other than 30 calendar days may be used if agreed to by both the Engineer and the Contractor.

3. A LOT is terminated per 334-5.4.4.

All partial LOTs will be evaluated based on the number of tests available, and will not be redefined.

334-5.4 Quality Control Sampling and Testing: Obtain all samples randomly as directed by the Engineer.

Should the Engineer determine that the Quality Control requirements are not being met or that unsatisfactory results are being obtained, or should any instances of falsification of test data occur, approval of the Contractor's Quality Control Plan will be suspended and production will be stopped.

334-5.4.1 Lost or Missing Verification/Resolution Samples: In the event that any of the Verification and/or Resolution samples that are in the custody of the Contractor are lost, damaged, destroyed, or are otherwise unavailable for testing, the minimum possible pay factor for each quality characteristic as described in 334-8.2 will be applied to the entire LOT in question, unless called for otherwise by the Engineer. Specifically, if the LOT in question has more than two sublots, the pay factor for each quality characteristic will be 0.55. If the LOT has two or less sublots, the pay factor for each quality characteristic will be 0.80. In either event, the material in question will also be evaluated in accordance with 334-5.9.5.

If any of the Verification and/or Resolution samples that are in the custody of the Department are lost, damaged, destroyed or are otherwise unavailable for testing, the corresponding Quality Control test result will be considered verified, and payment will be based upon the Contractor's data.

334-5.4.2 Plant Sampling and Testing Requirements: Obtain one random sample of mix per subplot in accordance with 334-5.1.1 as directed by the Engineer. Test the Quality Control split sample for gradation, asphalt binder content and volumetrics in accordance with 334-5.1.1. Complete all Quality Control testing within one working day from the time the samples were obtained.

334-5.4.3 Roadway Sampling and Testing Requirements: Obtain five 6 inch diameter roadway cores within 24 hours of placement at random locations as directed by the Engineer within each subplot. Test these Quality Control samples for density (G_{mb}) in accordance with 334-5.1.1. In situations where it is impractical to cut five cores per subplot, obtain a minimum of three cores per subplot at random locations as identified by the Engineer. Do not obtain cores any closer than 12 inches from an unsupported edge. Maintain traffic during the coring operation; core the roadway, patch the core holes (within three days of coring); and trim the cores to the proper thickness prior to density testing.

Density for the subplot shall be based on the average value for the cores cut from the subplot with the target density being the maximum specific gravity (G_{mm}) of the subplot. Once the average density of a subplot has been determined, do not retest the samples unless approved by the Engineer. Ensure proper handling and storage of all cores until the LOT in question has been accepted.

334-5.4.4 Individual Test Tolerances for Quality Control Testing: Terminate the LOT if any of the following Quality Control failures occur:

- 1) An individual test result of a subplot for air voids does not meet the requirements of Table 334-5,
- 2) The average subplot density for coarse mixes does not meet the requirements of Table 334-5,
- 3) Two consecutive test results for gradation (P_{200} only) do not meet the requirements of Table 334-5,
- 4) Two consecutive test results for asphalt binder content do not meet the requirements of Table 334-5,
- 5) The average subplot density for two consecutive subplots for fine mixes does not meet the requirements of Table 334-5,
- 6) Two core densities for coarse mixes within a subplot are less than 91.00% of G_{mm} .

When a LOT is terminated due to a QC failure, stop production of the mixture until the problem is resolved to the satisfaction of the Quality Control Manager(s) and/or Asphalt Plant Level II technician(s) responsible for the decision to resume production after a quality control failure, as identified in 105-8.6.4. In the event that it can be demonstrated that the problem can immediately be or already has been resolved, it will not be necessary to stop production. When a LOT is terminated, make all necessary changes to correct the problem. Do not resume production until appropriate corrections have been made. Inform the Engineer of the problem and corrections made to correct the problem. After resuming production, sample and test the material to verify that the changes have corrected the problem. Summarize this information and provide it to the Engineer prior to the end of the work shift when production resumes.

In the event that a Quality Control failure is not addressed as defined above, the Engineer's approval will be required prior to resuming production after any future Quality Control failures.

Address any material represented by a failing test result in accordance with 334-5.9.5. Any LOT terminated under this Subarticle will be limited to a maximum Pay Factor of 1.00 (as defined in 334-8.2) for each quality characteristic.

Table 334-5 Master Production Range	
Characteristic	Tolerance ⁽¹⁾
Asphalt Binder Content (percent)	Target ± 0.55
Passing No. 200 Sieve (percent)	Target ± 1.50
Air Voids (percent) Coarse Graded	2.00 - 6.00
Air Voids (percent) Fine Graded	2.30 - 6.00
Density (percent G_{mm}) ⁽²⁾	
Coarse Graded (minimum)	93.00
Fine Graded (minimum)	90.00
⁽¹⁾ Tolerances for sample size of $n = 1$ from the verified mix design	
⁽²⁾ Based on an average of 5 randomly located cores	

334-5.5 Verification Testing: In order to determine the validity of the Contractor's Quality Control test results prior to their use in the Acceptance decision, the Engineer will run verification tests.

334-5.5.1 Plant Testing: At the completion of each LOT, the Engineer will test a minimum of one Verification split sample randomly selected from the LOT. Results of the testing and analysis for the LOT will be made available to the Contractor within one working day from the time the LOT is completed. Verification samples shall be reheated at the target roadway compaction temperature for 1 1/2 hours plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1.

The Verification test results will be compared with the Quality Control test results based on the between-laboratory precision values shown in Table 334-6.

Table 334-6 Between-Laboratory Precision Values	
Property	Maximum Difference
G_{mm}	0.016
G_{mb} (gyratory compacted samples)	0.022
G_{mb} (roadway cores – fine graded mixture)	0.015
G_{mb} (roadway cores – coarse graded mixture)	0.018
P_b	0.44 percent
P_{-200}	FM 1-T 030 (Figure 2)
P_{-8}	FM 1-T 030 (Figure 2)

If all of the specified mix characteristics compare favorably, then the LOT will be accepted, with payment based on the Contractor's Quality Control test data for the LOT.

If any of the results do not compare favorably, then the Resolution samples from the LOT will be sent to the Resolution laboratory for testing, as described in 334-5.6.

334-5.5.2 Roadway Testing: At the completion of each LOT, the Engineer will determine the density (G_{mb}) of each core (previously tested by Quality Control) as described in 334-5.1.1 from the same subplot as the Plant samples. For situations where roadway density is not required for the random subplot chosen, then another subplot shall be randomly chosen for roadway

density cores only. Results of the testing and analysis for the LOT will be made available to the Contractor within one working day from the time the LOT is completed.

The individual Verification test results will be compared with individual Quality Control test results by the Engineer based on the between-laboratory precision values given in Table 334-6.

If each of the core test results compare favorably, then the LOT will be accepted with respect to density, with payment based on the Contractor's Quality Control test data for the LOT.

If any of the results do not compare favorably, then the core samples from the LOT will be sent to the Resolution laboratory for testing as specified in 334-5.6.

334-5.6 Resolution System:

334-5.6.1 Plant Samples: In the event of an unfavorable comparison between the Contractor's Quality Control test results and the Engineer's Verification test results on any of the properties identified in Table 334-6, the Resolution laboratory will test all of the split samples from the LOT for only the property (or properties) in question. Resolution samples shall be reheated at the target roadway compaction temperature for 1-1/2 hours plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1.

334-5.6.2 Roadway Samples: In the event of an unfavorable comparison between the Contractor's Quality Control test data and the Engineer's Verification test data on the density results, the Resolution laboratory will test all of the cores from the LOT. Testing will be as described in 334-5.1.1. Any damaged roadway cores will not be included in the evaluation; replace damaged cores with additional cores at the direction of the Engineer.

334-5.6.3 Resolution Determination: The Resolution test results (for the property or properties in question) will be compared with the Quality Control test results based on the between-laboratory precision values shown in Table 334-6.

If the Resolution laboratory results compare favorably with all of the Quality Control results, then acceptance and payment for the LOT will be based on the Quality Control results, and the Department will bear the costs associated with Resolution testing. No additional compensation, either monetary or time, will be made for the impacts of any such testing.

If the Resolution laboratory results do not compare favorably with all of the Quality Control results, then acceptance and payment for the LOT will be based on the Resolution test data for the LOT, and the costs of the Resolution testing will be deducted from monthly estimates. No additional time will be granted for the impacts of any such testing. In addition, in the event that the application of the Resolution test data results in a failure to meet the requirements of Table 334-5, address any material represented by the failing test result in accordance with 334-5.9.5.

In the event of an unfavorable comparison between the Resolution test results and Quality Control test results, make the necessary adjustments to assure that future comparisons are favorable.

334-5.7 Independent Verification Testing:

334-5.7.1 Plant: The Contractor shall provide sample boxes and take samples as directed by the Engineer for Independent Verification testing. Obtain enough material for three complete sets of tests (two samples for Independent Verification testing by the Engineer and one sample for testing by the Contractor). If agreed upon by both the Engineer and the Contractor, only one sample for Independent Verification testing by the Engineer may be obtained.

Independent Verification samples will be reheated at the target roadway compaction temperature for 1-1/2 hours plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. The Contractor's split sample, if tested immediately after sampling, shall be reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. If the Contractor's sample is not tested immediately after sampling, then the sample shall be reheated at the target roadway compaction temperature for 1-1/2 hours plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. The Contractor's test results shall be provided to the Engineer within one working day from the time the sample was obtained.

If any of the Independent Verification test results do not meet the requirements of Table 334-5, then a comparison of the Independent Verification test results and the Contractor's test results, if available, will be made. If a comparison of the Independent Verification test results and the Contractor's test results meets the precision values of Table 334-6 for the material properties in question, or if the Contractor's test results are not available, then the Independent Verification test results are considered verified and the Contractor shall cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Address any material represented by the failing test results in accordance with 334-5.9.5.

If a comparison of the Independent Verification test results and the Contractor's test results does not meet the precision values of Table 334-6 for the material properties in question, then the second Independent Verification sample shall be tested by the Engineer for the material properties in question. If a comparison between the first and second Independent Verification test results does not meet the precision values of Table 334-6 for the material properties in question, then the first Independent Verification test results are considered unverified for the material properties in question and no action shall be taken.

If a comparison between the first and second Independent Verification test results meets the precision values of Table 334-6 for the material properties in question, then the first Independent Verification sample is considered verified and the Contractor shall cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Address any material represented by the failing test results in accordance with 334-5.9.5.

The Engineer has the option to use the Independent Verification sample for comparison testing as specified in 334-6.

334-5.7.2 Roadway: Obtain five 6 inch diameter roadway cores within 24 hours of placement, as directed by the Engineer, for Independent Verification testing. In situations where it is impractical to cut five cores per subplot, obtain a minimum of three cores per subplot at random locations, as identified by the Engineer. These independent cores will be obtained from the same LOTs and sublots as the Independent Verification Plant samples, or as directed by the Engineer. The density of these cores will be obtained as described in 334-5.1.1. If the average of the results for the subplot does not meet the requirements of Table 334-5 for density, cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Address any material represented by the failing test results in accordance with 334-5.9.5.

334-5.8 Surface Tolerance: The asphalt mixture will be accepted on the roadway with respect to surface tolerance in accordance with the applicable requirements of 330-12.

334-5.9 Minimum Acceptable Quality Levels:

334-5.9.1 Pay Factors Below 0.90: In the event that an individual pay factor for any quality characteristic of a LOT falls below 0.90, take steps to correct the situation and report the actions to the Engineer. In the event that the pay factor for the same quality characteristic for two consecutive LOTs is below 0.90, cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Actions taken must be approved by the Engineer before production resumes.

334-5.9.2 Composite Pay Factors Less Than 0.90 and Greater Than or Equal to 0.80: If the composite pay factor for the LOT is less than 0.90 and greater than or equal to 0.80, cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Actions taken must be approved by the Engineer before production resumes.

334-5.9.3 Composite Pay Factors Less Than 0.80 and Greater Than or Equal to 0.75: If the composite pay factor for the LOT is less than 0.80 and greater than or equal to 0.75, address the defective material in accordance with 334-5.9.5.

334-5.9.4 Composite Pay Factors Less Than 0.75: If the composite pay factor for the LOT is less than 0.75, remove and replace the defective LOT at no cost to the Department, or as approved by the Engineer.

334-5.9.5 Defective Material: Assume responsibility for removing and replacing all defective material placed on the project, at no cost to the Department.

As an exception to the above and upon approval of the Engineer, obtain an engineering analysis by an independent laboratory (as approved by the Engineer) to determine the disposition of the material. The engineering analysis must be signed and sealed by a Professional Engineer licensed in the State of Florida.

The Engineer may determine that an engineering analysis is not necessary or may perform an engineering analysis to determine the disposition of the material.

Any material that remains in place will be accepted with a composite pay factor as determined by 334-8, or as determined by the Engineer.

If the defective material is due to a gradation, asphalt binder content or density failure, upon approval of the Engineer the Contractor may perform delineation tests on roadway cores in lieu of an engineering analysis to determine the limits of the defective material that requires removal and replacement. Prior to any delineation testing, all sampling locations shall be approved by the Engineer. All delineation sampling and testing shall be monitored and verified by the Engineer. The minimum limit of removal of defective material is fifty-feet either side of the failed sample. For materials that are defective due to air voids, an engineering analysis is required.

When evaluating defective material by engineering analysis or delineation testing, at a minimum, evaluate all material located between passing Quality Control, Process Control or Independent Verification test results. Exceptions to this requirement shall be approved by the Engineer.

334-6 Comparison Testing.

At the start of the project (unless waived by the Engineer) and at other times as determined necessary by the Engineer, provide split samples for comparison testing with the Engineer. The purpose of these tests is to verify that the testing equipment is functioning properly and that the testing procedures are being performed correctly. In the event that the Engineer determines that there is a problem with the Contractor's testing equipment and/or testing procedures, immediately correct the problem to the Engineer's satisfaction. In the event that the problem is not immediately corrected, cease production of the asphalt mixture until the problem is adequately resolved to the satisfaction of the Engineer.

If so agreed to by both the Contractor and the Engineer, the split sample used for comparison testing may also be used for the Quality Control sample. The split sample used for comparison testing will also meet the requirements for Independent Verification Testing described in 334-5.7.

334-7 Method of Measurement.

For the work specified under this Section (including the pertinent provisions of Sections 320 and 330), the quantity to be paid for will be the weight of the mixture, in tons. The pay quantity will be based on the project average spread rate, excluding overbuild, limited to a maximum of 105% of the spread rate determined in accordance with 334-1.4 or as set by the Engineer. The project average spread rate is calculated by totaling the arithmetic mean of the average daily spread rate values for each layer.

The bid price for the asphalt mix will include the cost of the liquid asphalt or the asphalt recycling agent and the tack coat application as directed in 300-8. There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix. For the calculation of unit price adjustments of bituminous material, the average asphalt content will be based on the percentage specified in 9-2.1.2. The weight will be determined as provided in 320-2 (including the provisions for the automatic recordation system).

Prepare a Certification of Quantities, using the Department's current approved form, for the certified Superpave asphalt concrete pay item. Submit this certification to the Engineer no later than Twelve O'clock noon Monday after the estimate cut-off or as directed by the Engineer, based on the quantity of asphalt produced and accepted on the roadway per Contract. The certification must include the Contract Number, FPID Number, Certification Number, Certification Date, period represented by Certification and the tons produced for each asphalt pay item.

334-8 Basis of Payment.

334-8.1 General: Price and payment will be full compensation for all the work specified under this Section (including the applicable requirements of Sections 320 and 330).

For materials accepted in accordance with 334-5, based upon the quality of the material, a pay adjustment will be applied to the bid price of the material as determined on a LOT by LOT basis. The pay adjustment will be assessed by calculating a Pay Factor for the following individual quality characteristics: pavement density, air voids, asphalt binder content, and the percentage passing the No. 200 and No. 8 sieves. The pay adjustment will be computed by multiplying a Composite Pay Factor for the LOT by the bid price per ton. Perform all calculations with the Department's Asphalt Plant - Pay Factor Worksheets.

334-8.2 Pay Factors:

334-8.2.1 Partial LOTs: For Partial LOTs where no random sample is obtained due to insufficient tonnage, a Composite Pay Factor of 1.00 shall be applied.

334-8.2.2 Two or Less Sublot Test Results: In the event that two or less sublot test results are available for a LOT, Pay Factors will be determined based on the Small Quantity Pay Table. The Small Quantity Pay Table and Pay Factor calculations are determined in accordance with the instructions contained within the Department's Asphalt Plant – Pay Factor Worksheets.

334-8.2.3 Three or More Sublot Test Results: When three or more sublot test results are available for a LOT, the variability-unknown, standard deviation method will be used to determine the estimated percentage of the LOT that is within the specification limits shown in (Table 334-7). The Percent Within Limits (PWL) is determined in accordance with the instructions contained within the Department's Asphalt Plant – Pay Factor Worksheets.

Table 334-7 Specification Limits	
Quality Characteristic	Specification Limits
Passing No. 8 sieve (percent)	Target \pm 3.1
Passing No. 200 sieve (percent)	Target \pm 1.0
Asphalt Content (percent)	Target \pm 0.40
Air Voids - Coarse Mixes (percent)	4.00 ± 1.40
Air Voids - Fine Mixes (percent)	4.00 ± 1.20
Density - Coarse Mixes (percent of G_{mm}):	94.50 ± 1.30
Density - Fine Mixes (percent of G_{mm}):	$93.00 + 2.00, - 1.20$ ⁽¹⁾
Note (1): If the Engineer (or Contract Documents) limits compaction to the static mode only, or for all one-inch thick lifts, compaction shall be in the static mode. No vibratory mode in the vertical direction will be allowed. Other vibratory modes will be allowed, if approved by the Engineer. In either case, the specification limits will be as follows: $92.00 + 3.00, -1.20$ percent of G_{mm} . No additional compensation, cost or time, shall be made.	

334-8.2.3.1 Pay Factors (PF): Pay Factors will be calculated by using the following equation:

$$\text{Pay Factor} = (55 + 0.5 \times \text{PWL}) / 100$$

The PWL is determined in accordance with the instructions contained within the Department's Asphalt Plant – Pay Factor Worksheets.

334-8.3 Composite Pay Factor (CPF): A Composite Pay Factor for the LOT will be calculated based on the individual Pay Factors (PF) with the following weighting applied: 35% Density (D), 25% Air Voids (V_a), 25% asphalt binder content (P_b), 10% Passing No. 200 (P_{-200}) and 5% Passing No. 8 (P_{-8}). Calculate the CPF by using the following formula:

$$\text{CPF} = [(0.350 \times \text{PF } D) + (0.250 \times \text{PF } V_a) + (0.250 \times \text{PF } P_b) + (0.100 \times \text{PF } P_{-200}) + (0.050 \times \text{PF } P_{-8})]$$

Where the Pay Factor (PF) for each quality characteristic is determined in either 334-8.2.2 or 334-8.2.3, depending on the number of sublot tests. Note that the number after each multiplication will be rounded to the nearest 0.01.

The pay adjustment shall be computed by multiplying the Composite Pay Factor for the LOT by the bid price per ton.

334-8.4 Payment: Payment will be made under:

Item No. 334- 1- Superpave Asphaltic Concrete - per ton.

336 ASPHALT RUBBER BINDER.
(REV 5-24-10) (FA 8-16-10) (1-11)

SECTION 336 (Pages 291-294) is deleted and the following substituted:

SECTION 336
ASPHALT RUBBER BINDER

336-1 Description.

Produce asphalt rubber binder for use in Asphalt Concrete Friction Courses and Asphalt Rubber Membrane Interlayers.

336-2 Materials.

336-2.1 Superpave PG Asphalt Binder: For the particular grade of asphalt as specified in Table 336-1, meet the requirements of Section 916.

336-2.2 Ground Tire Rubber: For the type of ground tire rubber, meet the requirements of Section 919.

336-3 Asphalt Rubber Binder.

Thoroughly mix and react the asphalt binder and ground tire rubber in accordance with the requirements of Table 336-1. Accomplish blending of the asphalt binder and ground tire rubber at the project site or asphalt plant, or at the supplier's terminal.

Table 336-1			
Asphalt Rubber Binder			
Binder Type	ARB 5	ARB 12	ARB 20
Rubber Type	TYPE A (or B) ⁽¹⁾	TYPE B (or A) ⁽²⁾	TYPE C (or B or A) ⁽²⁾
Minimum Ground Tire Rubber (by weight of asphalt binder)	5%	12%	20%
Binder Grade	PG 67-22	PG 67-22	PG 64-22
Temperature Range	300 - 335°F	300 - 350°F	335 - 375°F
Minimum Reaction Time	10 minutes	15 minutes (Type B)	30 minutes (Type C)
Unit Weight @ 60°F ⁽³⁾	8.6 lbs/gal.	8.7 lbs/gal.	8.8 lbs/gal.
Viscosity Range ⁽⁴⁾	4.0 - 6.0 Poises @ 300°F	10.0 - 15.0 Poises @ 300°F	15.0 - 20.0 Poises @ 350°F
(1) Use of Type B rubber may require an increase in the mix temperature in order to offset higher viscosity values. (2) Use of finer rubber could result in the reduction of the minimum reaction time. (3) Conversions to standard 60°F are as specified in 300-9.3. (4) FM 5-548, Viscosity of Asphalt Rubber by Rotational (Dip-N-Read) Viscometer or AASHTO T 316, Viscosity Determination of Asphalt Binder Using Rotational Viscometer. NOTE: The Contractor may adjust the minimum reaction time if approved by the Engineer depending upon the temperature, size of the ground tire rubber and viscosity measurement determined from the asphalt rubber binder material prior to or during production. Apply the asphalt rubber binder for use in membrane interlayers within a period of six hours, unless some form of corrective action such as cooling and reheating is approved by the Engineer.			

336-4 Equipment.

Use blending equipment that is designed for asphalt rubber binder and capable of producing a homogeneous mixture of ground tire rubber and asphalt binder meeting the requirements of Table 336-1. Use a batch type or continuous type blending unit that provides for sampling of the blended and reacted asphalt rubber binder material during normal production and provides for accurate proportioning of the asphalt binder and ground tire rubber either by weight or volume.

In order to meet specification requirements, keep the asphalt rubber uniformly blended while in storage. Equip storage tanks with a sampling device.

336-5 Testing of Asphalt Rubber Binder:

336-5.1 Quality Control Requirements: Test the asphalt rubber binder for the viscosity requirement of Table 336-1 at the following frequencies and situations:

1. One per batch (for batch blending) or two per day (for continuous blending) during blending at the project site or asphalt plant, or the supplier's terminal.

2. Each load delivered to the project site/asphalt plant when blended at the supplier's terminal.

3. Beginning of each day from the storage tank when storing the asphalt rubber binder at the project site or asphalt plant, or the supplier's terminal, obtain the sample for testing from the discharge piping exiting the storage tank.

Obtain the viscosity testing equipment specified in FM 5-548 and make it available to the Engineer for verification purposes at the project site/asphalt plant and supplier's terminal.

336-5.1.1 Action at Project Site or Asphalt Plant: If the asphalt rubber binder does not meet the minimum viscosity requirement at the project site or asphalt plant, stop use of the asphalt rubber binder in the Asphalt Concrete Friction Course and Asphalt Rubber Membrane Interlayer, notify the Engineer, and make the appropriate adjustments as necessary to meet the requirements of Table 336-1 in order to: (1) correct the viscosity of the blended material and (2) correct the blending operation. In the event that the corrective actions taken fail to correct the problem, or the material consistently fails to meet the minimum viscosity requirement, do not use the asphalt rubber binder in storage, and where applicable, stop all asphalt rubber blending operations at the project site or asphalt plant and solve the problem.

Do not use asphalt rubber binder with low viscosity in mix and interlayer construction, or resume blending operations at the project site or asphalt plant until the Engineer grants approval. The Engineer may require that any mix and interlayer placed with low viscosity asphalt rubber binder be evaluated in accordance with 334-5.9.5. In the event that the viscosity of the asphalt rubber binder increases to the extent that plant production or paving operations of the mix are adversely affected (i.e. density or texture problems occur), stop plant operations and resolve the problem to the Engineer's satisfaction.

336-5.1.2 Action at Supplier's Terminal: If the asphalt rubber binder does not meet the minimum viscosity requirement at the supplier's terminal, stop shipment and blending of asphalt rubber binder, and make the appropriate adjustments as necessary to meet the requirements of Table 336-1 in order to (1) correct the viscosity of the blended material in the tank, and (2) correct the blending operation. Resume shipment and blending of asphalt rubber

binder when a retest indicates the viscosity meets Specifications. Document actions taken in the Quality Control records.

336-5.2 Verification Requirements: The Engineer will test the asphalt rubber in accordance with FM 5-548 or AASHTO T 316 randomly on an as needed basis at the project site or asphalt plant, or the supplier's terminal to ensure conformance with the minimum viscosity requirement as specified in Table 336-1.

336-5.2.1 Action at Project Site or Asphalt Plant: If the asphalt rubber binder does not meet the viscosity requirements at the project site or asphalt plant, stop use of asphalt rubber binder. Do not use asphalt rubber binder with a viscosity outside of the specified range in mix and interlayer construction until corrective actions, as necessary to meet the requirements of Table 336-1, have been made, verified by passing test results, and the Engineer grants approval. The Engineer may require that any mix and interlayer placed with an asphalt rubber binder with a viscosity outside of the specified range be evaluated in accordance with 334-5.9.5. In the event that the viscosity of the asphalt rubber binder adversely affects plant production or paving operations, stop plant and paving operations and resolve the problem to the Engineer's satisfaction.

336-5.2.2 Action at Supplier's Terminal: If the asphalt rubber binder does not meet the viscosity requirements at the supplier's terminal, stop shipment and blending of asphalt rubber binder until corrective actions are made to meet the requirements of Table 336-1.

336-5.3 Asphalt Rubber Binder Blending Quality Control Records: Maintain adequate Quality Control records for the Engineer's review of all blending activities. The Quality Control records shall include at a minimum the following information (for each batch of asphalt rubber binder produced): asphalt rubber binder type, asphalt rubber binder batch quantity, asphalt binder supplier (including QPL number and LOT), asphalt binder quantity in gallons, ground tire rubber supplier (including QPL number and LOT), ground tire rubber quantity in pounds, individual quantities of asphalt rubber binder shipped, financial project number, shipping date, customer name, delivery location, and viscosity test results.

336-5.3.1 Additional Records for Blending at Project Site or Asphalt Plant: Monitor the ground tire rubber content in the asphalt rubber binder on a daily basis based on one of the following methods:

1. Record the weight of the ground tire rubber used and the number of gallons of asphalt rubber binder produced. Calculate the percentage of rubber used and confirm that the minimum rubber requirements are met. Use the unit weight per gallon for the various types of asphalt rubber binder shown in Table 336-1 for the calculations.

2. Record the weight of the ground tire rubber used and the number of gallons of asphalt binder used. Calculate the percentage of rubber used and confirm that the minimum rubber requirements are met.

336-6 Use of Excess Asphalt Rubber.

The Contractor may use excess asphalt rubber in other asphalt concrete mixes requiring the use of a PG 67-22 binder by blending with straight PG 67-22 binder so that the total amount of ground tire rubber in the binder is less than 2.0%. The Contractor may use excess asphalt rubber in asphalt concrete mixtures requiring the use of a recycling agent in a recycled mixture by blending with a recycling agent in such proportions that the total amount of ground tire rubber in the recycling agent is less than 1.0%.

336-7 Certification Requirements for Blending at Suppliers Terminal:

Where blending the asphalt rubber binder at the supplier's terminal, the supplier shall furnish certification on the bill of lading for each load delivered to the project site or asphalt plant that includes: the quantity of asphalt rubber binder, the asphalt rubber binder type, the customer name, the delivery location, and a statement that the asphalt rubber binder has been produced in accordance with and meets the requirements of Section 336. In addition, include, with the certification, copies of the certifications for the asphalt binder and ground tire rubber, as specified in 916-1.3.6 and 919-6, respectively.

336-8 Basis of Payment.

Payment for Asphalt Rubber Binder will be included in Sections 337 and 341, as appropriate.

337 ASPHALT CONCRETE FRICTION COURSES.

(REV 7-29-10) (FA 8-16-10) (1-11)

SECTION 337 (Pages 294 - 304) is deleted and the following substituted:

SECTION 337 ASPHALT CONCRETE FRICTION COURSES

337-1 Description.

Construct an asphalt concrete friction course pavement with the type of mixture specified in the Contract, or when offered as alternates, as selected. This Section specifies mixes designated as FC-5, FC-9.5, and FC-12.5.

Meet the plant and equipment requirements of Section 320, as modified herein. Meet the general construction requirements of Section 330, as modified herein.

337-2 Materials.

337-2.1 General Requirements: Meet the requirements specified in Division III as modified herein. The Engineer will base continuing approval of material sources on field performance. Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, if available, is:

www.dot.state.fl.us/Specificationsoffice/implemented/URLinSpecs/files/WarmMixAsphalt.pdf.

337-2.2 Asphalt Binder: Meet the requirements of Section 336, and any additional requirements or modifications specified herein for the various mixtures. When called for in the Contract Documents, use a PG 76-22 asphalt binder meeting the requirements of 916-1. For projects with a total quantity of FC-5, FC-9.5, or FC-12.5 less than 500 tons, the Contractor may elect to substitute a PG 76-22 for the ARB-12 or ARB-5, meeting the requirements of 916-1.

337-2.3 Coarse Aggregate: Meet the requirements of Section 901, and any additional requirements or modifications specified herein for the various mixtures.

337-2.4 Fine Aggregate: Meet the requirements of Section 902, and any additional requirements or modifications specified herein for the various mixtures.

337-2.5 Hydrated Lime: Meet the requirements of AASHTO M 303, Type 1.

Provide certified test results for each shipment of hydrated lime indicating compliance with the specifications.

337-2.6 Liquid Anti-strip Additive: Meet the requirements of 916-5 and be listed on the Department's Qualified Products List (QPL).

337-2.7 Fiber Stabilizing Additive (Required for FC-5 only): Use either a mineral or cellulose fiber stabilizing additive. Meet the following requirements:

337-2.7.1 Mineral Fibers: Use mineral fibers (made from virgin basalt, diabase, or slag) treated with a cationic sizing agent to enhance the disbursement of the fiber, as well as to increase adhesion of the fiber surface to the bitumen. Meet the following requirements for physical properties:

1. Size Analysis

Average fiber length: 0.25 inch (maximum)

Average fiber thickness: 0.0002 inch (maximum)

2. Shot Content (ASTM C612)

Percent passing No. 60 Sieve: 90 - 100

Percent passing No. 230 Sieve: 65 - 100

Provide certified test results for each batch of fiber material indicating compliance with the above tests.

337-2.7.2 Cellulose Fibers: Use cellulose fibers meeting the following requirements:

1. Fiber length: 0.25 inch (maximum)

2. Sieve Analysis

a. Alpine Sieve Method

Percent passing No. 100 sieve: 60-80

b. Ro-Tap Sieve Method

Percent passing No. 20 sieve: 80-95

Percent passing No. 40 sieve: 45-85

Percent passing No. 100 sieve: 5-40

3. Ash Content: 18% non-volatiles (plus or minus±5%)

4. pH: 7.5 (plus or minus±1.0)

5. Oil Absorption: 5.0% (plus or minus±1.0) (times fiber weight)

6. Moisture Content: 5.0% by weight (maximum)

Provide certified test results for each batch of fiber material indicating compliance with the above tests.

337-3 General Composition of Mixes.

337-3.1 General: Use a bituminous mixture composed of aggregate (coarse, fine, or a mixture thereof), asphalt binder, and in some cases, fibers and/or hydrated lime. Size, uniformly grade and combine the aggregate fractions in such proportions that the resulting mix meets the requirements of this Section.

337-3.2 Specific Component Requirements by Mix:

337-3.2.1 FC-5:

337-3.2.1.1 Aggregates: Use an aggregate blend which consists of either 100% crushed granite, 100% crushed Oolitic limestone or 100% other crushed materials (as approved by the Engineer for friction courses per Rule 14-103.005, Florida Administrative Code).

Crushed limestone from the Oolitic formation may be used if it

contains a minimum of 12% silica material as determined by FM 5-510 and the Engineer grants approval of the source prior to its use.

A list of aggregates approved for use in friction course may be available on the Department's website. The URL for obtaining this information, if available, is: www.dot.state.fl.us/statematerialsoffice/quality/programs/qualitycontrol/materialslistings/sources/frictioncourse.pdf.

337-3.2.1.2 Asphalt Binder: Use an ARB-12 asphalt rubber binder. If called for in the Contract Documents, use a PG 76-22 asphalt binder.

337-3.2.1.3 Hydrated Lime: Add the lime at a dosage rate of 1.0% by weight of the total dry aggregate to mixes containing granite.

337-3.2.1.4 Liquid Anti-strip Additive: Use a liquid anti-strip additive at a rate of 0.5% by weight of the asphalt binder for mixtures containing limestone aggregate. Other rates of anti-strip additive may be used upon approval of the Engineer.

337-3.2.1.5 Fiber Stabilizing Additive: Add either mineral fibers at a dosage rate of 0.4% by weight of the total mix, or cellulose fibers at a dosage rate of 0.3% by weight of total mix.

337-3.2.2 FC-9.5 and FC-12.5:

337-3.2.2.1: Aggregates: Use an aggregate blend that consists of crushed granite, crushed Oolitic limestone, other crushed materials (as approved by the Engineer for friction courses per Rule 14-103.005, Florida Administrative Code), or a combination of the above. Crushed limestone from the Oolitic formation may be used if it contains a minimum of 12% silica material as determined by FM 5-510 and the Engineer grants approval of the source prior to its use. As an exception, mixes that contain a minimum of 60% crushed granite may either contain: 1) up to 40% fine aggregate from other sources or 2) a combination of up to 20% RAP and the remaining fine aggregate from other sources.

A list of aggregates approved for use in friction course may be available on the Department's website. The URL for obtaining this information, if available, is: www.dot.state.fl.us/statematerialsoffice/quality/programs/qualitycontrol/materialslistings/sources/frictioncourse.pdf.

337-3.2.2.2: Asphalt Binder: Use an ARB-5 asphalt rubber binder. If called for in the Contract Documents, use a PG 76-22 asphalt binder.

337-3.3 Grading Requirements:

337-3.3.1 FC-5: Use a mixture having a gradation at design within the ranges shown in Table 337-1.

Table 337-1 FC-5 Gradation Design Range									
3/4 inch	1/2 inch	3/8 inch	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
100	85-100	55-75	15-25	5-10	--	--	--	--	2-4

337-3.3.2 FC-9.5: Meet the design gradation requirements for a SP-9.5 Superpave fine mix as defined in 334-3.2.2.

337-3.3.3 FC-12.5: Meet the design gradation requirements for a SP-12.5 Superpave fine mix as defined in 334-3.2.2.

337-4 Mix Design.

337-4.1 FC-5: The Department will design the FC-5 mixtures. Furnish the materials and all appropriate information (source, gradation, etc.) as specified in 334-3.2.7. The Department will have two weeks to design the mix.

The Department will establish the design binder content for FC-5 within the following ranges based on aggregate type:

Aggregate Type	Binder Content
Crushed Granite	5.5 - 7.0
Crushed Limestone (Oolitic)	6.5 - 8.0

337-4.2 FC-9.5 and FC-12.5: Provide a mix design conforming to the requirements of 334-3.2 unless otherwise designated in the plans. Develop the mix design using an ARB-5 or PG 76-22 asphalt binder if called for in the Contract Documents.

337-4.3 Revision of Mix Design: For FC-5, FC-9.5 and FC-12.5, meet the requirements of 334-3.3. For FC-5, all revisions must fall within the gradation limits defined in Table 337-1.

337-5 Contractor's Process Control.

Provide the necessary process control of the friction course mix and construction in accordance with the applicable provisions of 330-2 and 334-4.

The Engineer will monitor the spread rate periodically to ensure uniform thickness. Provide quality control procedures for daily monitoring and control of spread rate variability. If the spread rate varies by more than 5% of the spread rate set by the Engineer in accordance with 337-8, immediately make all corrections necessary to bring the spread rate into the acceptable range.

337-6 Acceptance of the Mixture.

337-6.1 FC-9.5 and FC-12.5: Meet the requirements of 334-5.

337-6.2 FC-5: Meet the requirements of 334-5 with the following exceptions:

1. The mixture will be accepted with respect to gradation ($P_{3/8}$, P_{4} , and P_{8}), and asphalt binder content (P_b) only.
2. Testing in accordance with AASHTO T 312-08 and FM 1-T 209 (and conditioning prior to testing) will not be required as part of 334-5.1.1.
3. The standard LOT size of FC-5 will be 2,000 tons, with each LOT subdivided into four equal sublots of 500 tons each.
4. The Between-Laboratory Precision Values described in Table 334-6 are modified to include ($P_{3/8}$, P_{4} , and P_{8}) with a maximum difference per FM 1-T 030 (Figure 2).
5. Table 334-5 (Master Production Range) is replaced by Table 337-2.
6. The mixture will be accepted on the roadway with respect to surface tolerance in accordance with 334-5.8. No density testing will be required for these mixtures.

Table 337-2 FC-5 Master Production Range	
Characteristic	Tolerance (1)
Asphalt Binder Content (%)	Target \pm 0.60
Passing 3/8 inch Sieve (%)	Target \pm 7.50

Table 337-2 FC-5 Master Production Range	
Characteristic	Tolerance (1)
Passing No. 4 Sieve (%)	Target \pm 6.00
Passing No. 8 Sieve (%)	Target \pm 3.50
(1) Tolerances for sample size of n = 1 from the verified mix design	

337-6.2.1 Individual Test Tolerances for FC-5 Production: Terminate the LOT if any of the following Quality Control failures occur:

- 1) An individual test result of a subplot for asphalt binder content does not meet the requirements of Table 337-2,
- 2) Two consecutive test results for gradation on any of the following sieve sizes ($P_{-3/8}$, P_{-4} , and P_{-8}) do not meet the requirements of Table 337-2,

When a LOT is terminated due to a QC failure, stop production of the mixture until the problem is resolved to the satisfaction of the Quality Control Manager(s) and/or Asphalt Plant Level II technician(s) responsible for the decision to resume production after a quality control failure, as identified in 105-8.6.4. In the event that it can be demonstrated that the problem can immediately be or already has been resolved, it will not be necessary to stop production. When a LOT is terminated, make all necessary changes to correct the problem. Do not resume production until appropriate corrections have been made. Inform the Engineer of the problem and corrections made to correct the problem. After resuming production, sample and test the material to verify that the changes have corrected the problem. Summarize this information and provide it to the Engineer prior to the end of the work shift when production resumes.

In the event that a Quality Control failure is not addressed as defined above, the Engineer's approval will be required prior to resuming production after any future Quality Control failures.

Address any material represented by a failing test result in accordance with 334-5.9.5. Any LOT terminated under this Subarticle will be limited to a maximum Pay Factor of 1.00 (as defined in 337-12.3) for each quality characteristic.

337-7 Special Construction Requirements.

337-7.1 Hot Storage of FC-5 Mixtures: When using surge or storage bins in the normal production of FC-5, do not leave the mixture in the surge or storage bin for more than one hour.

337-7.2 Longitudinal Grade Controls for Open-Graded Friction Courses: On FC-5, use either longitudinal grade control (skid, ski or traveling stringline) or a joint matcher.

337-7.3 Temperature Requirements for FC-5:

337-7.3.1 Air Temperature at Laydown: Spread the mixture only when the air temperature (the temperature in the shade away from artificial heat) is at or above 65°F. As an exception, place the mixture at temperatures no lower than 60°F, only when approved by the Engineer based on the Contractor's demonstrated ability to achieve a satisfactory surface texture and appearance of the finished surface. The minimum ambient temperature may be further reduced to 55°F when using warm mix technology, if agreed to by both the Engineer and the Contractor.

337-7.3.2 Temperature of the Mix: Heat and combine the asphalt binder and aggregate in a manner to produce a mix having a temperature, when discharged from the plant, meeting the requirements of 330-6.3. Meet all requirements of 330-9.1.2 at the roadway. The

target mixing temperature shall be established at 320°F for mixtures utilizing ARB-12 asphalt binder. For mixtures utilizing PG 76-22 asphalt binder, the target mixing temperature shall be established by the Contractor. The target mixing temperature may be reduced when using warm mix technology.

337-7.4 Compaction of FC-5: Provide two, static steel-wheeled rollers, with an effective compactive weight in the range of 135 to 200 PLI, determined as follows:

$$PLI = \frac{\text{Total Weight of Roller (pounds)}}{\text{Total Width of Drums (inches)}}$$

(Any variation of this equipment requirement must be approved by the Engineer.) Establish an appropriate rolling pattern for the pavement in order to effectively seat the mixture without crushing the aggregate. In the event that the roller begins to crush the aggregate, reduce the number of coverages or the PLI of the rollers. If the rollers continue to crush the aggregate, use a tandem steel-wheel roller weighing not more than 135 lb. per linear inch (PLI) of drum width.

337-7.5 Temperature Requirements for FC-9.5 and FC-12.5:

337-7.5.1 Air Temperature at Laydown: Spread the mixture only when the air temperature (the temperature in the shade away from artificial heat) is at or above 45°F. The minimum ambient temperature may be reduced by 5°F when using warm mix technology, if agreed to by both the Engineer and the Contractor.

337-7.5.2 Temperature of the Mix: Heat and combine the asphalt binder and aggregate in a manner to produce a mix having a temperature, when discharged from the plant, meeting the requirements of 330-6.3. Meet all requirements of 330-9.1.2 at the roadway.

337-7.6 Prevention of Adhesion: To minimize adhesion to the drum during the rolling operations, the Contractor may add a small amount of liquid detergent to the water in the roller.

At intersections and in other areas where the pavement may be subjected to cross-traffic before it has cooled, spray the approaches with water to wet the tires of the approaching vehicles before they cross the pavement.

337-7.7 Transportation Requirements of Friction Course Mixtures: Cover all loads of friction course mixtures with a tarpaulin, or waterproof cover, meeting requirements of 320-5.4.

337-7.8 Asphalt Rubber Binder Requirements: Meet the requirements of Section 336 Asphalt Rubber Binder, particularly noting testing and action requirements to be met at the project site.

337-8 Thickness of Friction Courses.

337-8.1 FC-12.5 and FC-9.5: The thickness of the friction course layer will be the plan thickness as shown in the Contract Documents. For construction purposes, the plan thickness will be converted to spread rate as defined in 334-1.4.

Plan quantities are based on a G_{mm} of 2.540, corresponding to a spread rate of 110 lbs. per square yard per inch. Pay quantities will be based on the actual maximum specific gravity of the mix being used.

337-8.2 FC-5: The total thickness of the FC-5 layer will be the plan thickness as shown in the Contract Documents. For construction purposes, the plan thickness will be converted to spread rate based on the combined aggregate bulk specific gravity of the asphalt mix being used as shown in the following equation:

$$\text{Spread rate (lbs. per square yard)} = t \times G_{sb} \times 40.5$$

Where: t = Thickness (in.) (Plan thickness)

G_{sb} = Combined aggregate bulk specific gravity from the verified mix design

The weight of the mixture shall be determined as provided in 320-2.2.

Plan quantities are based on a G_{sb} of 2.635, corresponding to a spread rate of 80 lbs. per square yards. Pay quantities will be based on the actual combined aggregate bulk specific gravity (G_{sb}) of the mix being used.

337-9 Special Equipment Requirements for FC-5.

337-9.1 Fiber Supply System: Use a separate feed system to accurately proportion the required quantity of mineral fibers into the mixture in such a manner that uniform distribution is obtained. Interlock the proportioning device with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes. Control the proportion of fibers to within plus or minus 10% of the amount of fibers required. Provide flow indicators or sensing devices for the fiber system, interlocked with plant controls so that the mixture production will be interrupted if introduction of the fiber fails.

When a batch plant is used, add the fiber to the aggregate in the weigh hopper or as approved and directed by the Engineer. Increase the batch dry mixing time by 8 to 12 seconds, or as directed by the Engineer, from the time the aggregate is completely emptied into the pugmill. Ensure that the fibers are uniformly distributed prior to the addition of asphalt rubber into the pugmill.

When a drum-mix plant is used, add and uniformly disperse the fiber with the aggregate prior to the addition of the asphalt rubber. Add the fiber in such a manner that it will not become entrained in the exhaust system of the drier or plant.

337-9.2 Hydrated Lime Supply System: For FC-5 mixes containing granite, use a separate feed system to accurately proportion the required quantity of hydrated lime into the mixture in such a manner that uniform coating of the aggregate is obtained prior to the addition of the asphalt rubber. Add the hydrated lime in such a manner that it will not become entrained in the exhaust system of the drier or plant. Interlock the proportioning device with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes and to ensure that all mixture produced is properly treated with hydrated lime. Control the proportion of hydrated lime to within plus or minus 10% of the amount of hydrated lime required. Provide and interlock flow indicators or sensing devices for the hydrated lime system with plant controls so that the mixture production will be interrupted if introduction of the hydrated lime fails. The addition of the hydrated lime to the aggregate may be accomplished by Method (A) or (B) as follows:

337-9.2.1 Method (A) - Dry Form: Add hydrated lime in a dry form to the mixture according to the type of asphalt plant being used.

When a batch plant is used, add the hydrated lime to the aggregate in the weigh hopper or as approved and directed by the Engineer. Increase the batch dry mixing time by eight to twelve seconds, or as directed by the Engineer, from the time the aggregate is completely emptied into the pugmill. Uniformly distribute the hydrated lime prior to the addition of asphalt rubber into the pugmill.

When a drum-mix plant is used, add and uniformly disperse the hydrated

lime to the aggregate prior to the addition of the asphalt rubber. Add the hydrated lime in such a manner that it will not become entrained in the exhaust system of the drier or plant.

337-9.2.2 Method (B) - Hydrated Lime/Water Slurry: Add the required quantity of hydrated lime (based on dry weight) in a hydrated lime/water slurry form to the aggregate. Provide a solution consisting of hydrated lime and water in concentrations as directed by the Engineer. Use a plant equipped to blend and maintain the hydrated lime in suspension and to mix it with the aggregates uniformly in the proportions specified.

337-9.3 Hydrated Lime Pretreatment: For FC-5 mixes containing granite, as an alternative to 337-9.2, pretreat the aggregate with hydrated lime prior to incorporating the aggregate into the mixture. Use a feed system to accurately proportion the aggregate and required quantity of hydrated lime, and mix them in such a manner that uniform coating of the aggregate is obtained. Control the proportion of hydrated lime to within plus or minus 10% of the amount required. Aggregate pretreated with hydrated lime in this manner shall be incorporated into the asphalt mixture within 45 days of pretreatment.

337-9.3.1 Hydrated Lime Pretreatment Methods: Pretreat the aggregate using one of the following two methods:

Pretreatment Method A – Dry Form: Add the required quantity of hydrated lime in a dry form to the aggregate. Assure that the aggregate at the time of pretreatment contains a minimum of 3% moisture over saturated surface dry (SSD) conditions. Utilize equipment to accurately proportion the aggregate and hydrated lime and mix them in such a manner as to provide a uniform coating.

Pretreatment Method B – Hydrated Lime/Water Slurry: Add the required quantity of hydrated lime (based on dry weight) in a hydrated lime/water slurry form to the aggregate. Provide a solution consisting of hydrated lime and water in a concentration to provide effective treatment. Use equipment to blend and maintain the hydrated lime in suspension, to accurately proportion the aggregate and hydrated lime/water slurry, and to mix them to provide a uniform coating.

337-9.3.2 Blending Quality Control Records: Maintain adequate Quality Control records for the Engineer's review for all pretreatment activities. Include as a minimum the following information (for each batch or day's run of pretreatment): pretreatment date, aggregate certification information, certified test results for the hydrated lime, aggregate moisture content prior to blending, as-blended quantities of aggregate and hydrated lime, project number, customer name, and shipping date.

337-9.3.3 Certification: In addition to the aggregate certification, provide a certification with each load of material delivered to the HMA plant, that the material has been pretreated in conformance with these specifications. Include also the date the material was pretreated.

337-10 Failing Material.

Meet the requirements of 334-5.9. For FC-5, use the Master Production Range defined in Table 337-2 in lieu of Table 334-5.

337-11 Method of Measurement.

For the work specified under this Section (including the pertinent provisions of Sections 320 and 330), the quantity to be paid for will be the weight of the mixture, in tons. The pay quantity will be based on the project average spread rate, limited to a maximum of 105% of the spread rate determined in accordance with 337-8 or as set by the Engineer. The project

average spread rate is calculated by totaling the arithmetic mean of the average daily spread rate values for each layer.

The bid price for the asphalt mix will include the cost of the asphalt binder (asphalt rubber (or polymer), asphalt cement, ground tire rubber, anti-stripping agent, blending and handling) and the tack coat application as directed in 300-8, as well as fiber stabilizing additive and hydrated lime (if required). There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix. The weight will be determined as provided in 320-2 (including the provisions for the automatic recordation system).

Prepare a Certification of Quantities, using the Department's current approved form, for the certified asphalt concrete friction course pay item. Submit this certification to the Engineer no later than Twelve O'clock noon Monday after the estimate cut-off or as directed by the Engineer, based on the quantity of asphalt produced and accepted on the roadway per Contract. The certification must include the Contract Number, FPID Number, Certification Number, Certification Date, period represented by Certification and the tons produced for each asphalt pay item.

337-12 Basis of Payment.

337-12.1 General: Price and payment will be full compensation for all the work specified under this Section (including the applicable requirements of Sections 320 and 330).

Based upon the quality of the material, a pay adjustment will be applied to the bid price of the material as determined on a LOT by LOT basis. The pay adjustment will be assessed by calculating a Pay Factor for individual quality characteristics. The pay adjustment will be computed by multiplying a Composite Pay Factor for the LOT by the bid price per ton. Perform all calculations with the Department's Asphalt Plant - Pay Factor Worksheets.

337-12.2 FC-9.5 and FC-12.5: Meet the requirements of 334-8.

337-12.3 FC-5: Meet the requirements of 334-8 with the following exceptions:

1. Pay factors will be calculated for asphalt binder content and the percentages passing the 3/8 inch, the No. 4, and the No. 8 sieves only.
2. The Small Quantity Pay Table for FC-5 Mixtures replaces the Small Quantity Pay Table for Dense Graded Mixtures in the Department's Asphalt Plant - Pay Factor Worksheets.
3. Table 337-3 replaces Table 334-7.
4. The Composite Pay Factor equation in 334-8.3 is replaced with the following:

$$\text{CPF} = [(0.20 \times \text{PF } 3/8 \text{ inch}) + (0.30 \times \text{PF No. 4}) + (0.10 \times \text{PF No. 8}) + (0.40 \times \text{PF AC})]$$

Table 337-3 Specification Limits for FC-5	
Quality Characteristic	Specification Limits
Asphalt Binder Content (%)	Target \pm 0.45
Passing 3/8 inch sieve (%)	Target \pm 6.00
Passing No. 4 sieve (%)	Target \pm 4.50
Passing No. 8 sieve (%)	Target \pm 2.50

337-12.4 Payment: Payment will be made under:
Item No. 337- 7- Asphaltic Concrete Friction Course - per ton.

**338 VALUE ADDED ASPHALT PAVEMENT.
REV (2-12-10) (FA 2-17-10) (7-10)**

ARTICLE 338-1 (Pages 304 and 305) is deleted and the following substituted:

338-1 Description.

Construct Value Added Asphalt Pavement consisting of Asphalt Concrete Structural Course and Asphalt Concrete Friction Course, subject to a three year warranty period after final acceptance of the Contract in accordance with 5-11.

For purposes of this Specification, the Responsible Party, as designated herein, is responsible for performance of the Value Added Asphalt Pavement including continued responsibility for performing all remedial work associated with pavement distresses exceeding threshold values determined in accordance with this Section, and as to which notice was provided to the Responsible Party.

The work specified in this Section will not be paid for directly, but will be considered as incidental to other Contract items.

ARTICLE 338-5 (Pages 306 and 312) is deleted and the following substituted:

338-5 Pavement Evaluation and Remedial Work.

338-5.1 General: The Department's Pavement Condition Survey Program, along with observations by the Engineer, will be used as the basis for determining the extent and the magnitude of the pavement distresses occurring on the project. In the event the level of distress exceeds any of the threshold values defined below, remedial work as described in 338-5.5 by the Responsible Party will be required.

The Department will monitor the pavement for distresses and may require remedial action at any time. For evaluation purposes, the project will be subdivided into LOTs of 0.1 mile per lane. When the segment is less than 0.1 mile, the segment will be called a partial LOT. For purposes of threshold values and remedial work, partial lots and lots will be treated as lots. The Department may conduct a Pavement Condition Survey of the value added pavement following the final acceptance of the project, and at intermediate times throughout the warranty period with findings provided when considered by the Department to be the obligation of the Responsible Party.

The final survey, if determined by the Engineer to be necessary, will be conducted before the end of the warranty period with results provided to the Responsible Party for those conditions exceeding contract threshold values requiring remedial action that the Department believes to be an obligation of the Responsible Party. The Department will be responsible for all costs associated with the surveys.

If the survey findings, intermediate or final, are to be disputed by the Responsible Party, written notification must be provided to the Engineer within 30 calendar days of the date of receipt of the information from the Department.

During the warranty period, the Responsible Party may monitor the project using nondestructive methods and may participate with the Department in the Pavement Condition Surveys upon request. The Responsible Party shall not conduct any coring, milling or other destructive methods without prior approval by the Engineer.

338-5.2 Category 1 Pavement: For purposes of this Specification, “Category 1 Pavement” is defined as mainline roadways, access roads and frontage roads with a design speed of 55 mph and greater.

Threshold values and associated remedial work for Category 1 Value Added Asphalt Pavement are specified in Table 338-1.

TABLE 338-1 Category 1 Pavements		
Type of Distress	Threshold Values	Remedial Work
Rutting ⁽¹⁾	Depth > 0.25 inch	Remove and replace the distressed LOT(s) to the full depth of all layers and to the full lane width ⁽²⁾
Ride ⁽³⁾	RN < 3.5	Remove and replace the friction course layer for the full length and the full lane width of the distressed LOT(s) ⁽⁴⁾
Settlement/Depression ⁽⁵⁾	Depth ≥ 1/2 inch	Propose the method of correction to the Engineer for approval prior to beginning remedial work
Cracking ⁽⁶⁾	Cumulative length of cracking > 30 feet for Cracks > 1/8 inch	Remove and replace the distressed LOT(s) to the full depth of all layers, and to the full lane width ⁽⁷⁾
Raveling and/or Delamination affecting the Friction Course ⁽⁸⁾	Any length	Remove and replace the distressed area(s) to the full distressed depth and the full lane width for the full distressed length plus 50' on each end
Pot holes and Slippage Area(s) ⁽⁸⁾	Observation by Engineer	Remove and replace the distressed area(s) to the full distressed depth and the full lane width for the full distressed length plus 50' on each end
Bleeding ⁽⁹⁾	Loss of surface texture due to excess asphalt, individual length ≥ 10 feet and ≥ 1 foot. in width.	Remove and replace the distressed area(s) to the full distressed depth and the full lane width for the full distressed length plus 50' on each end

TABLE 338-1
Category 1 Pavements

(1) Rutting: Rut depth to be determined by Laser Profiler in accordance with the Flexible Pavement Condition Survey Handbook. For any LOT that cannot be surveyed by Laser Profiler, the rut depth will be determined manually in accordance with the Flexible Pavement Condition Survey Handbook, with the exception that the number of readings per LOT will be one every 20 feet. For a partial LOT, a minimum of three measurements not exceeding 20 feet apart will be made. When the average of the measurements obtained manually exceeds 0.30 inch or if any individual measurement exceeds 0.6 inch, remedial work will be required.

(2) Remedial Work for Rutting: The Contractor may propose removal and replacement of less than the full depth of all layers by preparation and submittal of a signed and sealed engineering analysis report, demonstrating the actual extent of the distressed area(s). Remedial work must be performed in accordance with Table 338-1 unless approved otherwise by the Engineer.

(3) Ride: Ride Number (RN) to be established by Laser Profiler in accordance with FM 5-549.

(4) If the deficient ride is due to underlying asphalt layers; base, subgrade, or embankment which were constructed by the Responsible Party, propose the method of correction to the Engineer for approval prior to beginning the remedial work.

(5) Settlement/Depression: Depth of the settlement/depression to be determined by a 6 foot manual straightedge.

(6) Cracking: Beginning and ending of 1/8 inch cracking will be determined as the average of three measurements taken at one foot intervals. The longitudinal construction joint at the lane line will not be considered as a crack.

(7) Remedial Work for Cracking: The Contractor may propose removal and replacement of less than the full depth of all layers by preparation and submittal of a signed and sealed engineering analysis report, demonstrating the actual extent of the distressed area(s). Remedial work must be performed in accordance with Table 338-1 unless approved otherwise by the Engineer.

(8) Raveling, Delamination, Pot holes, Slippage: As defined and determined by the Engineer in accordance with the examples displayed at the following URL: www2.dot.state.fl.us/specificationsestimates/pavement.aspx

(9) Bleeding: Bleeding to be defined and determined by the Engineer in accordance with the examples displayed at the following URL: www2.dot.state.fl.us/specificationsestimates/pavement.aspx

338-5.3 Category 2 Pavement: For purposes of this Specification, "Category 2 Pavement" is defined as mainline roadways, access roads and frontage roads with a design speed less than 55 mph; approach transition and merge areas at toll booths; ramps; acceleration and deceleration lanes (including tapers); turn lanes; parking areas; rest areas; weigh stations; and agricultural inspection stations.

Threshold values and associated remedial work for Category 2 Value Added Asphalt Pavement are specified in Table 338-2.

TABLE 338-2
Category 2 Pavements

Type of Distress	Threshold Values	Remedial Work
Rutting ⁽¹⁾	Measured by Laser Profiler: See Table 338-1	See Table 338-1
	Manual Measurement: Avg. Depth > 0.4 inch	Remove and replace 1.5 inch ^(1a) the full lane width for the area plus 50 feet
Cracking	Cumulative length of cracking > 300 feet for Cracks > 1/8 inch	See Table 338-1
Surface Deterioration ⁽²⁾	See Table 338-1	See Table 338-1

TABLE 338-2 Category 2 Pavements		
Type of Distress	Threshold Values	Remedial Work
Settlement/Depression ⁽³⁾	Depth \geq 1/2 inch	See Table 338-1
<p>(1) Rutting: Rut depth to be determined by Laser Profiler in accordance with the Flexible Pavement Condition Survey Handbook. For any LOT that cannot be surveyed by the Laser Profiler, the rut depth will be determined manually in accordance with the Flexible Pavement Condition Survey Handbook, with the exception that the number of readings per LOT will be one every 20 feet. For partial LOT, minimum of three measurements not exceeding 20 feet apart will be checked. When the average of the measurements obtained manually exceeds 0.40 inch, or if any individual measurement exceeds 0.6 inch, remedial work will be required..</p> <p>(1a) If pavement has an open graded friction course, remove and replace 2.0 inches.</p> <p>(2) Surface Deterioration: As used in Table 338-2, Surface Deterioration includes Raveling and/or Delamination affecting the Friction Course; Pot holes; Slippage Area(s); and Bleeding; all as defined and footnoted in Table 338-1.</p> <p>(3)Settlement/Depression: Depth of the settlement/depression to be determined by a 6 foot manual straightedge.</p>		

338-5.4 Category 3 Pavement: For purposes of this Specification, “Category 3 Pavement” is defined as bicycle paths, walking paths, median crossovers, shoulders and other areas as determined by the Engineer.

Threshold values and associated remedial work for Category 3 Value Added Asphalt Pavement are specified in Table 338-3.

TABLE 338-3 Category 3 Pavements		
Type of Distress	Threshold Values	Remedial Work
Rutting	N/A	N/A
Cracking	Cumulative length of cracking > 500 feet for Cracks > 1/8 inch	See Table 338-1
Surface Deterioration ⁽¹⁾	See Table 338-1	See Table 338-1
Settlement/Depression ⁽²⁾	Depth \geq 1/2 inch	See Table 338-1
<p>(1) Surface Deterioration: As used in Table 338-3, Surface Deterioration includes Raveling and/or Delamination affecting the Friction Course; Pot holes; Slippage Area(s); and Bleeding; all as defined and footnoted in Table 338-1.</p> <p>(2) Settlement/Depression: Depth of the settlement/depression to be determined by a 6 foot manual straightedge.</p>		

338-5.5 Remedial Work: The Responsible Party will perform all necessary remedial work described within this Section at no cost to the Department. If the pavement distresses exceed threshold values and it is determined that the cause of the distress is due to the embankment, subgrade, base or other activities performed by the Contractor, the Responsible Party will be responsible for performing all remedial work associated with the pavement distress. Should an impasse develop in any regard as to the need for remedial work or the extent required, the Statewide Disputes Review Board will render a final decision by majority vote.

Remedial work will not be required if any one of the following conditions is found to apply:

a. Determination that the pavement thickness design as provided by the Department is deficient. The Department will make available a copy of the original pavement thickness design package and design traffic report to the Responsible Party upon request. The Responsible Party is responsible for performing all remedial work associated with the pavement distress if the pavement design is provided by the Contractor.

b. Determination that the Accumulated ESALs (Number of 18 Kip Equivalent Single Axle Loads in the design lane) has increased by 25% or more than the Accumulated ESALs used by the Department for design purposes for the warranty period for the pavement design life. In calculating ESALs, the Average Annual Daily Traffic (AADT) will be obtained from the Department's traffic count data and the T24 (Percent Heavy Trucks during a 24 hour period) will be obtained from the Department's traffic classification survey data.

c. Determination that the deficiency was due to the failure of the existing underlying layers that were not part of the Contract work.

d. Determination that the deficiency was the responsibility of a third party or its actions, unless the third party was performing work included in the Contract.

If a measured distress value indicates remedial action is required per Table 338-1, Table 338-2 and/or Table 338-3, the Responsible Party must begin remedial work within 45 calendar days of notification by the Department or a ruling of the Statewide Disputes Review Board. The Disputes Review Board will determine the allowable duration for the completion of the remedial work, but not to exceed 6 months.

In the event remedial action is necessary and forensic information is required to determine the source of the distress, the Department may core and/or trench the pavement. The Responsible Party will not be responsible for damages to the pavement as a result of any forensic activities conducted by the Department.

As applicable to distress criteria for rutting, ride and cracking for Category 1 and Category 2 pavements, when two LOTs requiring remedial action are not separated by three or more LOTs not requiring remedial action, the remedial work shall be required for the total length of all such contiguous LOTs, including the intermediate LOTs not requiring remedial action.

Additionally, for Category 1 and Category 2 pavements, where such areas of remedial action are required due to raveling, slippage or bleeding are separated by less than 1,000 feet, the remedial work will be required for the entire area contiguous to the distressed areas, including intermediate areas otherwise requiring no remedial action.

The Responsible Party has the first option to perform all remedial work that is determined by the Department to be their responsibility. If, in the opinion of the Engineer, the problem poses an immediate danger to the traveling public and the Responsible Party cannot provide temporary mitigation for the defect within 4 hours of written notification and restore the pavement to its original design condition within 72 hours of written notification, the Engineer has the authority to have the remedial work performed by other forces. Temporary mitigation includes the use of traffic control systems such as barricades, drums, or other approved devices to secure the area including lane closures if necessary, and constructing temporary repairs making it safe for the roadway user until the defect can be restored to its original design condition. The Responsible Party is responsible for all incurred costs of the work performed by other forces should the problem (remedial work) be determined to be the responsibility of the

Responsible Party. Remedial work performed by other forces does not alter any of the requirements, responsibilities or obligations of the Responsible Party.

The Responsible Party must complete all remedial work to the satisfaction of the Engineer. Any disputes regarding the adequacy of the remedial work will be resolved by the Statewide Disputes Review Board. Approval of remedial work does not relieve the Responsible Party from continuing responsibility under the provisions of this Specification.

Notify the Engineer in writing prior to beginning any remedial work. Meet the requirements of the Department's Standard Specifications for Road and Bridge Construction and implemented modifications thereto when performing any remedial work. Perform all signing and traffic control in accordance with the current edition of the Department's Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System. Provide Maintenance of Traffic during remedial work at no additional cost to the Department. Lane closure restrictions listed in the original Contract will apply to remedial work. Written request(s) to obtain permission for lane closure(s) for either forensic investigation or remedial work must be made to the Engineer 48 hours in advance of any lane closures. Do not perform any lane closures until written permission is given by the Engineer.

If remedial work necessitates a corrective action to overlying asphalt layers, pavement markings, signal loops, adjacent lane(s), roadway shoulders, or other affected Contract work, perform these corrective actions using similar products at no additional cost to the Department.

341 ASPHALT RUBBER MEMBRANE INTERLAYER. **(REV 7-29-09) (FA 8-11-09) (1-10)**

ARTICLE 341-4 (Pages 314 and 315) is deleted and the following substituted:

341-4 Contractor's Quality Control.

Provide the necessary quality control of the asphalt rubber binder, and interlayer construction in accordance with the Contract requirements. Provide in the Quality Control Plan procedures for monitoring and controlling of rate of application. If the rate of application varies by more than 5% from the rate set by the Engineer in accordance with 341-6, immediately make all corrections necessary to bring the spread rate into the acceptable range. The Engineer may take additional measurements at any time. The Engineer will randomly check the Contractor's measurement to verify the spread rate.

ARTICLE 341-5 (Page 315) is deleted and the following substituted:

341-5 Preparation of Asphalt Rubber Binder.

Meet the requirements of Section 336 Asphalt Rubber Binder, particularly noting testing and action requirements to be met at the project site/asphalt plant. Combine the materials as rapidly as possible for such a time and at such a temperature that the consistency of the binder approaches that of a semi-fluid material. The Engineer will be the sole judge of when the material has reached application consistency and will determine if an extender oil or diluent is needed for that purpose. After reaching the proper consistency, proceed with application immediately. Never hold the mixture at temperatures over 350°F for more than six hours after reaching that temperature.

346 PORTLAND CEMENT CONCRETE.
(REV 6-9-10) (FA 6-18-10) (1-11)

SUBARTICLE 346-3.1 (Pages 320 – 321) is deleted and the following substituted:

346-3.1 General: The separate classifications of concrete covered by this Section are designated as Class I, Class II, Class III, Class IV, Class V and Class VI. Strength, slump, and air content of each class are specified in Table 2.

Substitution of a higher class concrete in lieu of a lower class concrete may be allowed, if approved by the Engineer. When the compressive strength acceptance data is less than the minimum compressive strength of the higher design mix, notify the Engineer. Acceptance is based on the requirements in Table 2 for the lower class concrete.

TABLE 2			
Class of Concrete	Specified Minimum Strength (28-day) (psi)	Target Slump Value (inches) (c)	Air Content Range (%)
STRUCTURAL CONCRETE			
I (a)	3,000	3 (b)	1.0 to 6.0
I (Pavement)	3,000	2	1.0 to 6.0
II (a)	3,400	3 (b)	1.0 to 6.0
II (Bridge Deck)	4,500	3 (b)	1.0 to 6.0
III (e)	5,000	3 (b)	1.0 to 6.0
III (Seal)	3,000	8	1.0 to 6.0
IV	5,500	3 (b) (d)	1.0 to 6.0
IV (Drilled Shaft)	4,000	8.5	0.0 to 6.0
V (Special)	6,000	3 (b) (d)	1.0 to 5.0
V	6,500	3 (b) (d)	1.0 to 5.0
VI	8,500	3 (b) (d)	1.0 to 5.0

(a) For precast three sided culverts, box culverts, endwalls, inlets, manholes and junction boxes, the target slump value and air content will not apply. The maximum allowable slump is 6 inches, except as noted in (b). The Contractor is permitted to use concrete meeting the requirements of ASTM C 478 4,000 psi in lieu of Class I or Class II concrete for precast endwalls, inlets, manholes and junction boxes.

(b) The Engineer may allow a higher target slump when a Type F, G, I or II admixture is used, except when flowing concrete is used. The maximum target slump shall be 7 inches.

(c) For a reduction in the target slump for slip-form operations, submit a revision to the mix design to the Engineer.

(d) When the use of silica fume, ultrafine fly ash, or metakaolin is required as a pozzolan in Class IV, Class V, Class V (Special) or Class VI concrete, ensure that the concrete exceeds a resistivity of 29 KOhm-cm at 28 days, when tested in accordance with FM 5-578. Submit three 4 x 8 inch cylindrical test specimens to the Engineer for resistivity testing before mix design approval. Take the resistivity test specimens from the concrete of the laboratory trial batch or from the field trial batch of at least 3 yd³. Verify the mix proportioning of the design mix and take representative samples of trial batch concrete for the required plastic and hardened property tests. Cure the field trial batch specimens similar to the standard laboratory curing methods. Submit the resistivity test specimens at least 7 days prior to the scheduled 28 day test. The average resistivity of the three cylinders, eight readings per cylinder, is an indicator of the permeability of the concrete mix.

(e) When precast three-sided culverts, box culverts, endwalls, inlets, manholes or junction boxes require a Class III concrete, the minimum cementitious materials is 470 lb/yd³. Do not apply the air content range and the maximum target slump shall be 6 inches, except as allowed in (b).

SUBARTICLE 346-3.2 (Page 322) the second paragraph is deleted and the following substituted:

Test each load of concrete for slump to ensure the concrete is within the limits of 346-6.4. Ensure that the slump loss is gradual as evidenced by slump loss tests described below. The concrete elapsed time is the sum of the mixing and transit time, the placement time, the time required for removal of any temporary casing that causes or could cause the concrete to flow into the space previously occupied by the temporary casing and bolt/embedment installation.

SUBARTICLE 346-3.2.1 (Page 322) is deleted and the following substituted:

346-3.2.1 Slump Loss Test Requirements: Provide slump loss tests before drilled shaft concrete operations begin, demonstrating that the drilled shaft concrete maintains a slump of at least 5 inches throughout the concrete elapsed time. Inform the Engineer at least 48 hours before performing such tests. Perform slump loss testing of the drilled shaft mix using personnel meeting the requirements of Section 105. The Engineer may require a new slump loss test in the event that the temperature changes more than plus or minus 15°F, the environmental conditions change or the volume increases.

Perform the following procedures for slump loss tests:

(1) Begin all elapsed times when water is initially introduced into the mixer.

(2) The slump loss test is performed at a temperature consistent with the highest ambient and concrete temperatures expected during actual concrete placement. This test may be used for lower temperature placements without any admixture adjustments.

(3) Ensure that the mix is at least 3 cubic yards and is mixed in a truck mixer.

(4) After initial mixing, determine the slump, ambient and concrete temperatures and air content. Ensure that the concrete properties are within the required limits as specified in 346-3.1, Table 2.

(5) Verify the water to cementitious materials ratio and other delivery ticket data meet design mix requirements.

(6) Mix the concrete intermittently for 30 seconds every 5 minutes, at a speed greater than or equal to the midrange of the manufacturer's recommended mixing speed. When concrete is not being mixed, agitate the mixer at the midrange of the manufacturer's recommended agitating speed.

(7) Determine slump, ambient and concrete temperatures at 30 minute intervals until the slump is 5 inches or less. Remix the mix for one minute at the mixing speed of the mixer before these tests are run.

(8) Ensure that the concrete maintains a slump of at least 5 inches for the anticipated elapsed time.

(9) Cast cylinders to determine when 500 psi compressive strength is obtained for the purpose of transporting field samples to the laboratory.

(10) Obtain the Engineer's approval of slump loss test results in terms of elapsed time before concrete placements.

SUBARTICLE 346-4.2.2 (Page 326) is deleted and the following substituted:

346-4.2.2 Certification: If any chloride test data exceeds the limits in Table 4, identify the exception on the Construction Compliance with Specifications and Plans form.

SUBARTICLE 346-6.1 (Page 328) is deleted and the following substituted:

346-6.1 General: Develop a Quality Control Plan (QCP) as specified in Section 105. Meet the requirements of the approved QCP and Contract Documents. Ensure the QCP includes the necessary requirements to control the quality of the concrete.

Perform QC activities to ensure materials, methods, techniques, personnel, procedures and processes utilized during production meet the specified requirements. For precast/prestressed operations, ensure that the QC testing is performed by the producer.

Accept the responsibility for QC inspections on all phases of work. Ensure all materials and workmanship incorporated into the project meet the requirements of the Contract Documents.

When concrete plastic properties (slump, air content and temperature) could be significantly affected by handling between the point of delivery and the point of final placement, including the use of pumps, conveyor belts, troughs, chutes, barge transport or other means, include provisions in the QCP to sample the plastic concrete for all testing at the point of final placement.

Ensure the QCP includes any anticipated requirements for adjusting the concrete at the placement site. Include the testing procedures that will be implemented to control the quality of the concrete and ensure that concrete placed is within the tolerance range. Also, include provisions for the addition of water to concrete delivered to the placement site at designated level areas, to ensure the allowable amount of water stated on the concrete delivery ticket or the maximum water to cementitious materials ratio on the approved design mix are not exceeded. Ensure the anticipated ranges of jobsite water additions are described and the proposed methods of measuring water for concrete adjustments are included.

Failure to meet the requirements of this Specification or the QCP will automatically void the concrete portion of the QCP. To obtain QCP re-approval, implement corrective actions as approved by the Engineer. The Engineer may allow the Contractor to continue any ongoing concrete placement but the Engineer will not accept concrete for any new placement until the QCP re-approval is given by the Engineer.

SUBARTICLE 346-6.3(Page 329) is deleted and the following substituted:

346-6.3 Delivery Certification: Ensure that an electronic delivery ticket is furnished with each batch of concrete before unloading at the placement site. The delivery ticket may be proprietary software or in the form of an electronic spreadsheet, but shall be printed. Ensure that the materials and quantities incorporated into the batch of concrete are printed on the delivery ticket. Include the following information on the Delivery Ticket:

- (1) Arrival time at jobsite,
- (2) Time that concrete mix has been completely placed,
- (3) Number of revolutions upon arrival at the jobsite,
- (4) Total gallons of water added at the jobsite,
- (5) Additional mixing revolutions when water is added,
- (6) Total number of revolutions at mixing and agitating speed.

Items 3 through 6 do not apply to non-agitating concrete transporting vehicles.

Ensure the batcher responsible for production of the batch of concrete signs the delivery ticket, certifying the batch of concrete was produced in accordance with the Contract Documents.

Verify that the chloride test results on the delivery ticket meet the requirements of Table 4.

Sign the delivery ticket certifying that the design mix maximum specified water to cementitious materials ratio was not exceeded due to any jobsite adjustments to the batch of concrete, and that the batch of concrete was delivered and placed in accordance with the Contract Documents.

SUBARTICLE 346-6.4 (Pages 329 – 330) is deleted and the following substituted:

346-6.4 Plastic Property Tolerances: Do not place concrete with a slump more than plus or minus 1.5 inches from the target slump value specified in Table 2.

Reject concrete with slump or air content that does not fall within the specified tolerances and immediately notify the concrete production facility that an adjustment of the concrete mixture is required so that it will fall within specified tolerances. If a load does not fall within the tolerances, test each subsequent load and the first adjusted load. If failing concrete is not rejected or adjustments are not implemented, the Engineer may reject the concrete and terminate further production until the corrections are implemented.

Do not allow concrete to remain in a transporting vehicle to reduce slump. Water may be added only upon arrival of the concrete to the jobsite and not thereafter.

SUBARTICLE 346-7.4 (Page 330) is deleted and the following substituted:

346-7.4 Concreting in Cold Weather: Do not mix concrete when the air temperature is below 45°F and falling. Mix and place concrete when the air temperature in the shade, and away from artificial heat, is 40°F and rising. Protect the fresh concrete from freezing until the concrete reaches a minimum compressive strength of 1,500 psi unless the concrete is to be heat cured. The requirements of concreting in cold weather are not applicable to precast concrete placement operations occurring in a temperature controlled environment.

SUBARTICLE 346-7.6 (Page 331) is deleted and the following substituted:

346-7.6 Transit Time: Ensure compliance with the following maximum allowable time between the initial introduction of water into the mix and depositing the concrete in place:

TABLE 6	
Non-Agitator Trucks	Agitator Trucks
45 minutes	60 minutes
75 minutes*	90 minutes*
*When a water-reducing and retarding admixture (Type D, Type G or Type II) is used.	

SUBARTICLE 346-7.7 (Page 331) is deleted and the following substituted:

346-7.7 Adding Water to Concrete at the Placement Site: Perform an initial slump test before the addition of water at the jobsite. If the slump, as delivered, is outside the tolerance range, reject the load. If the slump is within the tolerance range, that load may be adjusted by adding water provided the addition of water does not exceed the water to cementitious materials ratio as defined by the mix design. After adjusting the slump, perform a slump test to confirm the concrete is within the slump tolerance range. Perform a slump test on the next load to ensure the concrete is within the slump tolerance range. Do not place concrete represented by slump test results outside of the tolerance range.

ARTICLE 346-8 (Page 331) is deleted and the following substituted:

346-8 Plastic Concrete Sampling and Testing.

QC tests include air content, temperature, slump, and preparing compressive strength cylinders for testing at later dates. In addition, calculate the water to cementitious materials ratio in accordance with FM 5-501 for compliance to the approved mix design.

Ensure that each truck has a valid mixer identification card issued by the Department, the revolution counter on the mixer is working properly, and calibration of the water dispenser has been performed within the last twelve months and verify batch weights within required limits of the mix design. Reject any concrete batches that are delivered in trucks that do not have mixer identification cards. The Contractor may remove the mixer identification cards when a truck mixer is discovered to be in noncompliance. When the mixer identification card is removed for

noncompliance, forward the card to the District Materials Engineer in the District where the plant is located.

Perform plastic concrete tests on the initial delivery of each concrete design mix each day. Ensure QC technicians meeting the requirements of Section 105 are present and performing tests throughout the placement operation. Ensure one technician is present and performing tests throughout the placement operation at each placement site. If a placement site has multiple concrete trucks, identify the number of technicians in the Quality Control Plan. If a placement site has multiple trucks placing concrete, then have at least two technicians present at that site. Ensure that the equipment used for delivery, placement and finishing meets the requirements of this Specification. Do not proceed with the placement operation until QC tests confirm that the delivered concrete complies with the plastic properties specified. When a truck designated for QC testing arrives at the site of discharge, subsequent trucks may not discharge until QC testing results are known. Reject non-complying loads at the jobsite. Ensure that corrections are made on subsequent loads.

Furnish sufficient concrete of each design mix as required by the Engineer for verification testing. When the Engineer's verification test results do not compare with the QC plastic properties test results, within the limits defined by the Independent Assurance (IA) checklist comparison criteria, located in Materials Manual Chapter 5, disposition of the concrete will be at the option of the Contractor.

On concrete placements consisting of only one load of concrete, perform initial sampling and testing in accordance with this Section. The acceptance sample and plastic properties tests may be taken from the initial portion of the load. If any of the QC plastic properties tests fail, reject the remainder of that load, terminate the LOT and notify the Engineer. Make cylinders representing that LOT from the same sample of concrete.

Following termination of a LOT, obtain samples from a new load, and perform plastic properties tests until such time as the water to cementitious materials ratio, air content, temperature and slump comply with the Specification requirements. Initiate a new LOT once the testing indicates compliance with Specification requirements.

Suspend production when three LOTs, or when any five LOTs in two days of production of the same design mix are outside the specified tolerances. Make the necessary revisions to concrete operations and increase the frequency of QC testing in the QCP to bring the concrete within allowable tolerances. Obtain the Engineer's approval of the revisions before resuming production. After production resumes, obtain the Engineer's approval before returning to the normal frequency of QC testing.

If concrete placement stops for more than 90 minutes, perform initial plastic properties testing on the next batch and continue the LOT. Cylinders cast for that LOT will represent the entire LOT.

When the Department performs Independent Verification, the Contractor may perform the same tests on the concrete at the same time. The Department will compare results based on the Independent Assurance Checklist tolerances.

When the Department's Independent Verification test results do not meet the requirements of this Section, the Engineer may require the Contractor to revise the QCP.

SUBARTICLE 346-9.1 (Pages 333 – 334) is deleted and the following substituted:

346-9.1 General: Perform plastic properties tests in accordance with 346-8 and cast a set of three QC cylinders (either 4 inch by 8 inch or 6 inch by 12 inch cylinders are acceptable), for all structural concrete incorporated into the project. Take these acceptance samples randomly as determined by a random number generator (acceptable to the Department). The Department will independently perform verification plastic properties tests and cast a set of verification cylinders. The verification cylinders will be the same size cylinder selected by the Contractor, from a separate sample from the same load of concrete as the Contractor's QC sample.

The Department may perform inspections in lieu of plastic properties tests of the precast plants producing Class I and II concrete.

For each set of QC cylinders verified by the Department, cast one additional cylinder from the same sample, and identify it as the QC "hold" cylinder. The Department will also cast one additional "hold" cylinder from each Verification sample. Provide curing facilities that have the capacity to store all QC, Verification, "hold" and Independent Verification cylinders simultaneously for the initial curing. All cylinders will be clearly identified as outlined in the Sample/Lot Numbering System instructions located on the State Materials Office website. Deliver the QC samples, including the QC "hold" cylinder to the final curing facility in accordance with ASTM C 31. At this same time, the Department will deliver the Verification samples, including the Verification "hold" cylinder, to their final curing facility.

Test the QC laboratory cured samples for compressive strength at the age of 28 days, or any other specified age, in a laboratory meeting and maintaining at all times the qualification requirements listed in Section 105.

The QC testing laboratory will input the compressive strength test results into the Department's sample tracking database within 24 hours. When the QC testing laboratory cannot input the compressive strength test results into the Department's sample tracking database within 24 hours, the QC testing laboratory will notify the Verification testing laboratory within 24 hours of testing the cylinder and provide the Verification testing laboratory the compressive strength test results. Ensure the compressive strength results are input into the Department's sample tracking database within 72 hours of determining the compressive strength of the cylinders.

The Department will average the QC compressive strength test data, average the Verification compressive strength test data, and compare the averages. In the event that one set of compressive strength data for a set of cylinders falls outside the range of the other set of cylinders, use the lower Range of Average Compressive Strength to determine the comparison criteria. Based on this comparison, the Department will determine if the Comparison Criteria as shown in Table 7 has been met. When the difference between QC and Verification are less than or equal to the Comparison Criteria, the QC data is verified. When the difference between QC and Verification data exceeds the Comparison Criteria, the Engineer will initiate the resolution procedure.

Table 7	
Range of Average Compressive Strength	Comparison Criteria
Less than 3500 psi	420 psi
3,501 – 4,500 psi	590 psi
4,501 – 6,500 psi	910 psi

6,501 – 8,500 psi	1,275 psi
Greater than 8,500 psi	1,360 psi

SUBARTICLE 346-9.2 (Pages 334 – 335) is deleted and the following substituted:

346-9.2 Sampling Frequency:

As a minimum, sample and test concrete of each design mix for water to cementitious materials ratio, air content, temperature, slump and compressive strength once per LOT as defined by Table 8. When more than one concrete production facility is used for the same mix design, describe the method of sampling, testing and LOT numbering in the QC Plan. The Engineer will randomly verify one of every four consecutive LOTs of each design mix based on a random number generator. The Department may perform Independent Verification testing to verify compliance with specification requirements. All QC activities, calculations, and inspections will be randomly confirmed by the Department.

TABLE 8	
Class Concrete	Maximum LOT Size
I	one day's production
I (Pavement)	250 lane ft, or one day's production, whichever is less
II, II (Bridge Deck), III, IV, V (Special), V, VI	50 yd ³ , or one day's production, whichever is less
IV (Drilled Shaft)	50 yd ³ , or two hours between placements, whichever is less
III (Seal)	Each Seal placement

346-9.2.1 Reduced Frequency for Acceptance Tests: When ten consecutive strength test results from the same mix design for a Class IV or higher class of concrete are produced at the same concrete production facility, on a given Contract have all been verified and have attained an average strength greater than two standard deviations above the specified minimum, then the LOT may represent a maximum production quantity of 100 yd³. When five consecutive strength test results from the same mix design for a Class III or lower class of concrete is produced at the same concrete production facility on a given Contract have all been verified and have attained an average strength greater than two standard deviations above the specified minimum, the LOT may represent a maximum production quantity of 100 yd³.

The average of the consecutive compressive strength test results, based on the class of concrete, can be established using historical data from a previous Department project. The data must also represent the same prime/subcontractor. The tests from the previous Department project must be within the last 60 calendar days or may also be established by a succession of samples on the current project. Only one sample can be taken from each LOT. Test data must be from a laboratory meeting the requirements of Section 105.

If at any time a strength test is not verified and/or the average strength of the previous ten or five consecutive samples based on the class of concrete described above,

from the same mix design and the same production facility is less than the specified minimum plus two standard deviations, the maximum production quantity represented by the LOT will return to 50 yd³. In order to reinitiate reduced frequency, a new set of strength test results will be required.

SUBARTICLE 346-9.4 (Pages 335 – 336) is deleted and the following substituted:

346-9.4 Acceptance of Concrete:

Accept or reject concrete on the basis of plastic property results in accordance with 346-6.4.

Ensure that the hardened concrete strength test results are obtained in accordance with 346-9.3. Do not discard a cylinder strength test result based on low strength (strength below the specified minimum strength as per the provisions of this Section).

When one of the three QC cylinders from a LOT is lost, damaged or destroyed, determination of compressive strength will be made by averaging the remaining two cylinders. If more than one QC cylinder from a LOT is lost, damaged or destroyed, the Contractor will core the structure at no additional expense to the Department to determine the compressive strength. Acceptance of LOT may be based on verification data at the discretion of the Engineer. Obtain the approval of the Engineer to core, and of the core location prior to coring.

For each QC cylinder that is lost, damaged or destroyed, payment for that LOT will be reduced by \$750.00 per 1,000 psi of the specified design strength [Example: loss of two Class IV (Drill Shaft) QC cylinders that has no verification data will require the element to be cored and a penalty will be assessed $(4,000 \text{ psi} / 1,000 \text{ psi}) \times \$750 \times 2 = \$6,000$. This reduction will be in addition to any pay adjustment for low strength.

When QC compressive strength test results are not verified, the resolution procedure will be used to accept or reject the concrete. Maintain the “hold” cylinders until the verification of the compressive strength test results.

When QC test results are verified, the Engineer will accept the concrete based on QC test results. The Engineer will accept at full pay only LOTs of concrete represented by plastic property results which meet the requirements of the approved mix design and strength test results which equal or exceed the respective specified minimum strength.

SUBARTICLE 346-9.6 (Page 337) is deleted and the following substituted:

346-9.6 Small Quantities of Concrete: When a project has a total plan quantity of less than 50 yd³, that concrete will be accepted based on the satisfactory compressive strength of the QC cylinders. Provide certification to the Engineer that the concrete was batched and placed in accordance with the Contract Documents. Submit a quality control plan for the concrete placement operation in accordance with Section 105. In addition, the Engineer may conduct Independent Verification (IV) testing as identified in 346-9. Evaluate the concrete in accordance with 346-10 at the discretion of the Engineer.

SUBARTICLE 346-10.1 (Page 337) is deleted and the following substituted:

346-10.1 General: When a concrete acceptance strength test result falls more than 500 psi below the specified minimum strength, and the Department determines that an investigation is necessary, make an investigation into the structural adequacy of the LOT of concrete represented by that acceptance strength test result at no additional expense to the Department. The Engineer may also require the Contractor to perform additional strength testing as necessary to determine structural adequacy of the concrete.

Furnish either a structural analysis performed by the Specialty Engineer to establish strength adequacy or drilled core samples as specified in 346-10.3 to determine the in-place strength of the LOT of concrete in question at no additional expense to the Department. Obtain the Engineer's approval before taking any core samples. When the concrete is deemed to have low strength, obtain and test the cores and report the data to the Engineer within 14 days of the 28 day compressive strength tests. Core strength test results obtained from the structure will be accepted by both the Contractor and the Department as the in-place strength of the LOT of concrete in question. The core strength test results will be final and used in lieu of the cylinder strength test results for determination of structural adequacy and any pay adjustment. The Department will calculate the strength value to be the average of the compressive strengths of the three individual cores. This will be accepted as the actual measured value.

SUBARTICLE 346-10.2 (Pages 337 – 338) is deleted and the following substituted.

346-10.2 Determination of Structural Adequacy: If core strength test results are less than 500 psi below the specified minimum strength, consider the concrete represented by the cores structurally adequate. If the core strength test results are more than 500 psi below the specified minimum strength, the Department will consider the concrete represented by the cores structurally questionable. Submit a structural analysis performed by the Specialty Engineer. If the results of the structural analysis indicate adequate strength to serve its intended purpose with adequate durability, and is approved by the Department, the Contractor may leave the concrete in place subject to the requirements of 346-11, otherwise, remove and replace the LOT of concrete in question at no additional expense to the Department.

SUBARTICLE 346-11.2 (Page 338) is deleted and the following substituted.

346-11.2 Basis for Pay Adjustments: When an acceptance strength test result falls more than 500 psi below the specified minimum strength, core samples may be obtained in accordance with ASTM C 42 from the respective LOT of concrete represented by the low acceptance strength test result for determining pay adjustments. Price adjustment will be applied to the certified invoice price the Contractor paid for the concrete or the precast product.

SECTION 346 (Pages 317 – 340) is expanded by the following new Article:

346-12 Pay Reduction for Plastic Properties

If concrete is placed even when the result of plastic properties testing requires its rejection, the payment for concrete represented by the plastic property tests will be reduced by twice the invoice price per cubic yard for all concrete in the load that is placed. If the Engineer authorizes placement of the concrete, there will be no pay reduction.

350 CEMENT CONCRETE PAVEMENT.
(REV 6-8-10) (FA 7-12-10) (1-11)

ARTICLE 350-1 (Pages 343 – 344) is deleted and the following substituted:

350-1 Description.

Construct Portland cement concrete pavement in one course, on a prepared subgrade. Use either the fixed-form or the slip-form method of construction. When reinforced cement concrete pavement is specified or required, use concrete reinforced with steel bars or steel fabric, in accordance with details shown in the plans. The Engineer may require a demonstration of equipment and paving operations.

If any uncontrolled cracks appear during the life of the Contract, remove and replace the cracked concrete at no expense to the Department. Investigate and implement immediate effective solutions to eliminate further cracks, in consultation with, and subject to the approval of the Engineer.

Furnish the following information in the Quality Control Plan (QCP) as required in Section 105:

1. A detailed sequence and schedule of concrete placement operations including, but not limited to, width of pavement to be placed, proposed equipment, production rates, working hours, concrete hauling, and placement, curing, sawing, and sealing methods. Identify backup equipment and the procedures that will be followed in the case of a breakdown of equipment.
2. A method to ensure the proper placement of reinforcing steel, tie bars and dowel bars.
3. A traffic control plan that includes provisions for the placement and maintenance of barriers required to protect the pavement from traffic, for a minimum of 14 days after concrete placement.
4. Defined provisions for adequate lighting for all work done at night, including finishing, curing, and sawing joints.
5. A method for ensuring pavement thickness is met and a consolidation procedure is identified.
6. If forms are to be utilized define the material, dimensions, type, connections, and staking of the forms.
7. Define the procedure for the protection of the fresh concrete pavement from inclement weather.

SUBARTICLE 350-3.3 (Page 345) is deleted and the following substituted:

350-3.3 Vibratory Units: Consolidate the concrete for the full width of the strip being placed with either surface pan type or internal type vibrators. Use a vibration method with sufficient intensity and duration to ensure complete consolidation of the concrete without causing segregation of the materials.

For the surface vibrators, use a frequency of not less than 3,500 impulses per minute. For internal type vibrators, use a frequency of not less than 5,000 impulses per minute for tube vibrators and not less than 7,000 impulses per minute for spud vibrators. When using spud-type internal vibrators adjacent to forms, either hand-operated or attached to spreaders or finishing machines, use a frequency of not less than 3,500 impulses per minute. Measure and record the frequency of internal vibrators in plastic concrete and submit data to the Engineer. Mount spud vibrators such that the free tip trails, and space spud vibrators at a maximum interval of 30 inches.

Provide an amplitude of vibration with spud vibrators that is sufficient for the vibration to be perceptible on the surface of the concrete along the entire width of the strip being placed. Measure and record the actual frequency of vibrations and submit data to the Engineer. Control all vibration by the forward movement of the spreader or finishing machine so that vibration automatically ceases when stopping the forward movement of the spreader.

SUBARTICLE 350-5.4 (Page 347) is deleted and the following substituted:

350-5.4 Cleaning Forms: Thoroughly clean the forms after each use and before placing concrete against them. Apply a release agent in accordance with the manufacturer's recommendations.

ARTICLE 350-6 (Page 347) is deleted and the following substituted:

350-6 Protection from Weather.

Meet the requirements of 400-7.1 when placing concrete. When rain appears imminent, stop all paving operations, and cover the surface of the unhardened concrete with the protective covering.

SUBARTICLE 350-7.2 (Page 347) is deleted and the following substituted:

350-7.2 Fabric: Place welded wire reinforcement at right angles to the centerline of the pavement and accurately to the position and location shown in the plans. Lap adjacent sheets of welded wire reinforcement not less than 6 inches. Make the laps only in the longitudinal members.

SUBARTICLE 350-9.1 (Pages 348 and 349) is deleted and the following substituted:

350-9.1 General Requirements: Immediately after placing the concrete, strike-off, consolidate, and finish it to produce a finished pavement in accordance with the cross-section, width, and surface finish required by the Contract Documents. Perform the sequence of operations as follows: strike-off; vibratory consolidation; screeding; floating; removal of laitance; straightedging; and final surface finish. Except as specified, perform strike-off, consolidation, screeding, and floating by the machine method.

Use equipment that is fully and accurately adjustable to produce a pavement meeting project requirements. Use equipment that is capable of operating in a consistent and smooth manner under all conditions of use.

As soon as possible after screeding while the concrete is plastic, correct all flaws such as cavities, blemishes, marks, or scratches that will not be removed by planing. .

Provide a concrete surface true to grade, cross slope and superelevation, and free of irregularities. If the Engineer permits adding water to assist the finishing operations, apply water as a fog spray by means of approved spray equipment.

SUBARTICLE 350-18 (Pages 357 - 358) is deleted and the following substituted:

350-18 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, including any preparation of the subgrade not included in the work to be paid for under another Contract item; all transverse and longitudinal joint construction, including tie-bars and dowel bars; the furnishing of test specimens; repair of core holes; and all incidentals necessary to complete the work.

Payment will be made under:

- | | |
|-------------------|--|
| Item No. 350- 1- | Plain Cement Concrete Pavement - per square yard. |
| Item No. 350- 2- | Reinforced Cement Concrete Pavement - per square yard. |
| Item No. 350- 72- | Cleaning and Resealing Joints - per foot. |
| Item No. 350- 78- | Cleaning and Sealing Random Cracks - per foot. |

355 VALUE ADDED PORTLAND CEMENT CONCRETE PAVEMENT.

REV (2-12-10) (FA 2-17-10) (7-10)

SECTION 355-1 (Page 368) is deleted and the following substituted:

355-1 Description.

Construct Value Added Portland Cement Concrete Pavement (Concrete Pavement), subject to a five year warranty period after final acceptance of the Contract in accordance with 5-11. This Section applies only to new pavements, including added lanes.

Furnish a copy of each mix design to the Engineer at least 14 days prior to any paving work.

Perform all the associated work specified in this Section including continued responsibility for performing all remedial work associated with pavement distresses exceeding

threshold values determined in accordance with this Section and as to which notice was provided to the Contractor.

The work specified in this Section will not be paid for directly, but will be considered as incidental to other Contract items.

SECTION 355-4 (Pages 368 - 370) is deleted and the following substituted:

355-4 Pavement Evaluation and Remedial Work.

355-4.1 General: The Department's Pavement Condition Survey Program along with observations by the Engineer will be used as the basis for determining the extent and the magnitude of the pavement distresses occurring on the project. In the event the level of distress exceeds any of the threshold values defined below, remedial work as described in 355-5 by the Contractor will be required.

The Department will monitor the pavement for distresses and may require remedial action at any time. The Department may conduct a Pavement Condition Survey of the value added pavement following the final acceptance of the project, and at intermediate times throughout the warranty period with findings provided when considered by the Department to be the obligation of the Contractor.

The final survey, if determined by the Engineer to be necessary, will be conducted before the end of the warranty period with results provided to the Contractor for those conditions exceeding contract threshold values requiring remedial action that the Department believes to be an obligation of the Contractor. The Department will be responsible for all costs associated with the surveys.

If the survey findings, intermediate or final, are to be disputed by the Contractor, written notification must be provided to the Engineer within 30 calendar days of the date of receipt of the information from the Department.

During the warranty period, the Contractor may monitor the pavement using nondestructive methods and may participate with the Department in the Pavement Condition Surveys upon request. Do not conduct any coring, milling or other destructive methods without prior approval by the Engineer.

355-4.2 Distress Indicators: The Department will use Ride, Spalling and Cracking, as distress indicators in accordance with the Rigid Pavement Condition Survey Handbook to evaluate the Concrete Pavement. Ride Number (RN) will be established by Laser Profiler in accordance with FM 5-549. For ride evaluation purposes, the project will be subdivided into lots of 0.1 mile per lane and partial lots which are segments that are less than 0.1 mile. For the purposes of threshold values and remedial work, partial lots and lots will be treated as lots.

355-4.3 Threshold Values and Remedial Work: Threshold values and associated remedial work for the Concrete Pavement are specified in Table 355-1.

TABLE 355-1 Concrete Pavement Threshold Values and Remedial Work		
Type of Distress	Threshold Values	Remedial Work
Ride	Ride Number < 3. 50	Grind all deficient lots and partial lots in accordance with Section 352.

TABLE 355-1 Concrete Pavement Threshold Values and Remedial Work		
Type of Distress	Threshold Values	Remedial Work
Spalling in the wheel path	Four areas in any Lane Mile exceeding 1 inch in width and exceeding 6 inches in length OR any single area exceeding 3 inches in width.	Full depth slab replacement for a minimum of 6 feet in length and the full width of the slab in accordance with Section 353.
Spalling outside the wheel path	Four areas in any Lane Mile exceeding 1 1/2 inches in width and 12 inches in length OR any single area exceeding 3 inches in width and 12 inches in length.	Full depth slab replacement for a minimum of 6 feet in length and the full width of the slab in accordance with Section 353.
Cracking	Four Cracks in any Lane Mile with width exceeding 1/8 inch OR any Crack exceeding 3/16 inch.	Full depth slab replacement for a minimum of 6 feet in length and the full width of the slab in accordance with Section 353.
Shattered Slab	Cracking patterns that divide the slab into three or more segments	Full slab replacement in accordance with Section 353.

SECTION 355-5 (Pages 370 and 371) is deleted and the following substituted:

355-5 Remedial Work.

Perform all necessary remedial work described in this Section at no cost to the Department. Should an impasse develop in any regard as to the need for remedial work or the extent required, the Statewide Disputes Review Board will render a final decision by majority vote.

Remedial work will not be required if any one of the following conditions is found to apply:

a. Determination that the pavement thickness design as provided by the Department is deficient. The Department will make available a copy of the original pavement thickness design package and design traffic report to the Contractor upon request. The Contractor will be responsible for performing all remedial work associated with the pavement distress if the pavement design is provided by the Contractor.

b. Determination that the Accumulated ESALs (Number of 18 Kip Equivalent Single Axle Loads in the design lane) have increased by 25% or more than the Accumulated ESALs used by the Department for design purposes for the warranty period for the pavement design life. In calculating ESALs, the Average Annual Daily Traffic (AADT) will be obtained from the Department's traffic count data and the T24 (Percent Heavy Trucks during a 24 hour period) will be obtained from the Department's traffic classification survey data.

c. Determination that the deficiency was due to the failure of the existing underlying layers that were not part of the Contract work.

d. Determination that the deficiency was the responsibility of a third party or its actions, unless the third party was performing work included in the Contract.

If a measured distress value indicates remedial action is required per Table 355-1, begin remedial work within 45 calendar days of notification by the Department or a ruling of the Statewide Disputes Review Board. The Statewide Disputes Review Board will determine the allowable duration for the completion of the remedial work, but not to exceed 6 months.

If remedial action is necessary and forensic information is required, it is the responsibility of the Contractor to determine the source of the distress. The Contractor will not be responsible for damages to the pavement as a result of any forensic activities conducted at the discretion of the Engineer.

As applicable to distress criteria for ride, when two lots requiring remedial action or a partial lot and a lot are not separated by three or more lots not requiring remedial action, the remedial work shall be required for the total length of all such contiguous lots and partial lots, including the intermediate lots not requiring remedial action.

The Contractor has the first option to perform all remedial work, as determined by the Department. If, in the opinion of the Engineer, the problem poses an immediate danger to the traveling public and the Contractor cannot provide temporary mitigation for the defect within 4 hours of written notification and restore the pavement to its original design condition within 72 hours of written notification, the Engineer has the authority to have the remedial work performed by other forces. Temporary mitigation includes the use of traffic control systems such as barricades, drums, or other approved devices to secure the area including lane closures if necessary, and constructing temporary repairs making it safe for the roadway user until the defect can be restored to its original design condition. The Contractor is responsible for all incurred costs of the work performed by other forces should the problem (remedial work) be determined to be the responsibility of the Contractor. Remedial work performed by other forces does not alter any of the requirements, responsibilities or obligations of the Contractor.

Complete all remedial work to the satisfaction of the Engineer. Any disputes regarding the adequacy of the remedial work will be resolved by the Statewide Disputes Review Board. Approval of remedial work does not relieve the Contractor from continuing responsibility under the provisions of this Specification.

Notify the Engineer in writing prior to beginning any remedial work. Meet the requirements of the Department's Standard Specifications for Road and Bridge Construction and implemented modifications hereto when performing any remedial work. Perform all signing and traffic control in accordance with the Department's Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System. Provide Maintenance of Traffic during remedial work at no additional cost to the Department. Lane closure restrictions listed in the original Contract will apply to remedial work. Written request(s) to obtain permission for lane closure(s) for either forensic investigation or remedial work must be made to the Engineer 48 hours in advance of any lane closures. Do not perform any lane closures until written permission is given by the Engineer.

If remedial work necessitates a corrective action to the pavement markings, adjacent lane(s), or roadway shoulders, perform these corrective actions using similar products at no cost to the Department.

370 BRIDGE APPROACH EXPANSION JOINTS.
(REV 6-21-10) (FA 7-29-10) (1-11)

ARTICLE 370-2 (Page 371 – 372) is deleted and the following substituted:

370-2 Materials.

Bar Reinforcement: Use bar reinforcing steel meeting the requirements of 931-1.1.

Concrete: For the expansion joint subslab, use concrete meeting the requirements of Section 347.

Galvanized Sheet Metal: Use galvanized sheet metal meeting the requirements shown in the plans.

Seal: Use compression seals in accordance with Section 932 and Design Standards Index No. 306.

400 CONCRETE STRUCTURES
(REV 6-14-10) (FA 7-29-10) (1-11)

ARTICLE 400-1 (Page 373) is deleted and the following substituted:

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 inserts and lifting devices, handling, storage, shipping, and erection.

Obtain incidental precast products 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.

SUBARTICLE 400-5.7.1 (Pages 376 - 379) is deleted and the following substituted:

400-5.7.1 General: Utilization of stay-in-place metal forms is permitted in lieu of removable forms to form concrete bridge decks between beams and between the webs of individual box girders when designated in the plans. Stay-in-place metal forms may be of the cellular, non-cellular or non-cellular with top cover sheet type. The flutes of non-cellular stay-in-place metal forms may be filled with polystyrene foam or concrete. When polystyrene foam is used to fill the forms, fill form flutes completely; do not allow any portion of the polystyrene foam to extend beyond the limits of the flutes. Ensure that the polystyrene foam remains in its required position within flutes during the entire concrete placement process. Do not use reinforcing steel supports or other accessories in such a manner as to cause damage to the polystyrene foam. Replace all damaged polystyrene foam to the satisfaction of the Engineer.

Apply polymer sheeting to stay-in-place metal forms in accordance with the requirements in the following table. Apply polymer sheeting to all faces and edges (including

sheared edges) of support angles used on bridges with Moderately and Extremely Aggressive Superstructure Environmental Classifications (as shown in the Plans). No polymer sheeting is required for beam attachment straps or clips partially embedded in concrete, and for support angles used on bridges with a Slightly Aggressive Superstructure Environmental Classification. Use polymer sheeting materials and application methods as described herein.

Polymer Sheeting Usage Requirements				
Form Type		Superstructure Environmental Classification (as shown in Plans)		
		Slightly Aggressive	Moderately Aggressive	Extremely Aggressive
Non-cellular form with concrete filled flutes		No polymer sheeting required	Polymer sheeting required on bottom side	Polymer sheeting required on bottom side
Non-cellular form with polystyrene foam filled flutes		Polymer sheeting required on inside	Polymer sheeting required on both sides*	Polymer sheeting required on both sides*
Non-cellular form with Top Cover Sheet	Top Cover Sheet	Polymer sheeting required on bottom side	Polymer sheeting required on bottom side	Polymer sheeting required on bottom side
	Non-cellular form	Polymer sheeting required on top side	Polymer sheeting required on both sides*	Polymer sheeting required on both sides*
Cellular form		No polymer sheeting allowed or required	Not permitted	Not permitted

* Polymer sheeting not required on bottom side of form located within box girders and U-beams.

Prior to using stay-in-place metal 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 metal forms such that they in no way infringe upon the concrete outline of the slab shown on the plans. Use stay-in-place metal 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 the structural steel components. Do not connect polymer coated angles or other hardware that support polymer coated metal forms to the beam attachment straps or clips by welding. Electrical grounding to reinforcing steel is prohibited.

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. 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 metal forms until the forming system has been approved by the Engineer. The Contractor is responsible for the performance of the stay-in-place forms.

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 any 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 any additional weight of the forms and the weight of any extra concrete that may be required to fill the forms. 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 pre-stressed 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.

Structures designed, detailed, and dimensioned for the use of stay-in-place metal forms:

Prior to using stay-in-place metal 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 forms shown on the plans, then modify the supporting components to support the excess weight as specified by the Contractor's Specialty Engineer.

For all structures utilizing structural steel supporting components, paint the vertical sides of the top flange prior to installation of the stay-in-place metal forms in accordance with Section 560.

For non-polymer sheeting form surfaces, use zinc paint coating in accordance with Section 562 to all accessories cut from galvanized sheets, which are not embedded in concrete.

SUBARTICLE 400-7.13.2 (page 389) is deleted and the following substituted:

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.

SUBSECTION 400-11.3 (Page 394) is deleted.

SUBSECTION 400-11.4 (Page 394) is the deleted and the following substituted:

400-11.3 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.

ARTICLE 400-14 (Page 394- 395) is deleted and the following substituted:

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

Location of Concrete Placement	Minimum Time for Form Removal for any Strength Concrete*	Minimum (%) of 28-day Compressive Strength for Form Removal
(2) Walls, piers, columns, sides of beams and other vertical surfaces	24 hours***	50***
(3) Front face form of curbs	6 hours	70
* For mass concrete, remove forms in accordance with 346-3.3 ** 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.		

When using the percent of required strength, cast test cylinders for each mix for compressive strength determination or develop a curing concrete strength versus time curve (S/T Curve) which can be used in lieu of multiple test cylinders to determine when percent of required strength has been met.

Prior to curve use; obtain the Engineer's approval of the S/T Curve and its supporting data. An approved testing laboratory may be used to provide this information with approval of the Engineer. Plot S/T Curves using at least three different elapsed times that begin once test cylinders are cast; however, one of the elapsed times must be prior to the Contractor's intended form removal. Each elapsed time plotted must have a corresponding compressive strength computed by averaging the compressive strength of two test cylinders.

Cure such test cylinders as nearly as practical in the same manner as the concrete in the corresponding structural component, and test them in accordance with ASTM C 39 and ASTM C 31. Perform cylinder casting, curing, and testing at no expense to the Department and under the observation of the Engineer. When the S/T Curve indicates a compressive strength equal to or greater than the percentage of specified strength shown in the table above for form removal, the Contractor may remove the forms. When the ambient air temperature falls 15°F or more below the ambient air temperature that existed during development of a S/T Curve, use a S/T Curve that corresponds to the lower temperature and that is developed in accordance with this section.

Do not remove forms at any time without the consent of the Engineer. Even when the Engineer provides consent to remove the forms, the Contractor is responsible for the work.

SUBARTICLE 400-15.2.5.1 (page 397) is deleted and the following substituted:

400-15.2.5.1 General: Apply a Class 4 finish on bridge decks and concrete approach slabs. On Short Bridges (bridges having a length less than or equal to 100 ft), and on Miscellaneous Bridges (Pedestrian, Trail and Movable Spans) regardless of length, meet the finish and smoothness requirements of 400-15.2.5.2 and 400-15.2.5.4. On Long Bridges (bridges having a length greater than 100 ft) meet the finish and smoothness requirements of 400-15.2.5.3 and 400-15.2.5.5. When an existing bridge deck is widened, see the plans for the finish and smoothness requirements of the existing bridge deck and its new widened section. After meeting the screeding requirements of 400-7.13 and curing requirements of 400-16 and the smoothness requirements, herein, groove the bridge deck and approach slabs.

Regardless of bridge length, finish decks with less than 2 1/2 inches of top cover in accordance with the requirements for Short Bridges.

SUBARTICLE 400-15.2.5.5 (pages 398 – 399) is deleted and the following substituted:

400-15.2.5.5 Smoothness Evaluation and Concrete Surface Planing, Long Bridges (including approach slabs): Prior to planing, provide a smoothness evaluation of the completed bridge deck and exposed concrete surfaces of approach slabs by a computerized Cox California-type profilograph in accordance with the criteria herein and FM 5-558E. Furnish this evaluation through an independent provider approved by the Engineer, using equipment calibrated by the Engineer. All bridge deck and concrete approach slab surfaces to within 2 feet of gutter lines are subject to this smoothness evaluation.

Prior to initial profilograph testing, complete work on the bridge deck and approach slabs. Thoroughly clean and clear the bridge deck and approach slab areas to be evaluated for smoothness of all obstructions and provide the smoothness evaluation. Ensure that no radio transmissions or other activities that might disrupt the automated profilograph equipment are allowed during the evaluation.

Average the Profile Index Value for the bridge deck, including the exposed concrete surfaces of the approach slabs, for the left and right wheel path of each lane. The maximum allowable Profile Index Value for acceptable smoothness is 10 inches per mile utilizing the 0.2 inch blanking band. Apply these criteria to a minimum of 100 feet of each lane. Additionally, correct individual bumps or depressions exceeding a cutoff height of 0.3 inch from a chord of 25 feet (see ASTM E-1274) on the profilograph trace. Ensure that the surface meets a 1/4 inch in 10 feet straightedge check made transversely across the deck and approach slabs if determined necessary by the Engineer. Provide additional profilograph testing as necessary following longitudinal planing and any other actions taken to improve smoothness, until a profile meeting the acceptance criteria is obtained.

Regardless of whether expansion joints are installed before or after deck planing is complete, plane off the concrete deck surface to a minimum depth of 1/4 inch and also meet or exceed the profilograph smoothness criteria. Longitudinally plane the entire bridge deck and exposed concrete surfaces of the approach slabs using a self-propelled planing machine with gang mounted diamond saw cutting blades specifically designed for such work. Use the profilograph generated smoothness data, to establish the optimum planing machine settings. Plane the deck surface to within 2 feet of the gutter line so that there is a smooth transition, without vertical faces or sudden surface discontinuities, from the fully planed surface to the unplaned surface. Use a machine with a minimum wheel base length of 15 feet, constructed and operated in such manner that it does not cause strain or damage to deck or approach slab surfaces, excessive ravels, aggregate fractures or spalling. The equipment shall be approved by the Engineer. Perform longitudinal planing parallel to the roadway centerline, and provide a consistent, textured surface. Clean the surface of all slurry/debris generated during this work concurrently with operation of the machine.

After the deck has been planed the minimum 1/4 inch, reevaluate the surface smoothness using the profilograph testing described above. Perform cycles of planing and profilograph retesting as necessary until the deck and exposed concrete surfaces of approach slabs are in compliance with the smoothness criteria but do not exceed the maximum concrete removal depth of 1/2 inch.

SUBARTICLE 400-21.2 (page 407) is deleted and the following substituted:

400-21.2 Investigation, Documentation and Monitoring: The Engineer will inspect concrete surfaces as soon as surfaces are fully visible after casting, with the exception of surfaces of precast concrete products produced in offsite plants, between 7 and 31 days after the component has been burdened with full dead load, and a minimum of 7 days after the bridge has been opened to full unrestricted traffic. The Engineer will measure the width, length and depth of each crack and establish the precise location of the crack termination points relative to permanent reference points on the member. The Engineer will determine if coring of the concrete is necessary when an accurate measurement of crack depth cannot be determined by use of a mechanical probe. The Engineer will monitor and document the growth of individual cracks at an inspection interval determined by the Engineer to determine if cracks are active or dormant after initial inspection. The Engineer will perform all final bridge deck crack measurements once the deck is free of all debris and before transverse grooves are cut and after planing is complete for decks that require planing.

Provide the access, equipment and personnel needed for the Engineer to safely perform this work at no expense to the Department. Core cracks for use by the Engineer in locations and to depths specified by the Engineer at no expense to the Department.

SUBARTICLE 400-21.3 (page 407) is deleted and the following substituted:

400-21.3 Classification of Cracks: The Engineer will classify cracks as either nonstructural or structural and determine the cause. In general, nonstructural cracks are cracks 1/2 inch or less deep from the surface of the concrete; however, the Engineer may determine that a crack greater than 1/2 inch deep is nonstructural. In general, structural cracks are cracks that extend deeper than 1/2 inch. A crack that is fully or partially underwater at any time during its service life will be classified as a structural crack unless the Environment note on the General Notes sheet in the plans categorizes the substructure as slightly aggressive, in which case, the nonstructural crack criteria may apply as determined by the Engineer.

Review and comment on the Engineer's crack classification; however, the Engineer will make the final determination.

410 PRECAST CONCRETE BOX CULVERT. (REV 6-8-10) (FA 7-29-10) (1-11)

SUBARTICLE 410-3.1 (Page 416) is deleted and the following substituted:

410-3.1 General: Meet the requirements of Section 346, except as modified herein:

Prepare, cure, and test the test cylinders in accordance with ASTM C-31 and ASTM C-39 test methods. Follow the alternative method of compaction, in accordance with ASTM C-497, if the consistency of concrete is too stiff for compaction by rodding or internal vibrations. Expose shipping strength test cylinders to the same curing conditions as the precast concrete box sections. Cure the 28-day strength test cylinders in accordance with Section 346.

Perform all concrete quality control testing and inspections in accordance with 346-9.2.

For training and other qualifications meet the requirements of Section 105. Test all QC samples for compressive strength in a laboratory meeting the requirements of Section 105.

SUBARTICLE 410-6.1 (Page 419) is deleted and the following substituted:

410-6.1 Casting: Cast precast elements in unyielding beds and forms. Ensure bearing surfaces in casting forms are level and straight, and vertical surfaces are plumb prior to casting. Ensure surfaces within the forms against which concrete will be cast, are clean and free from rust and hardened residual concrete. Provide full concrete cover clearance to all form wires and other miscellaneous pieces of metal, except as permitted by Section 415. Bend all tie wires away from the form surface to provide maximum concrete cover. Provide inserts and lifting devices in accordance with 450-9.2.1.

415 REINFORCING STEEL–BAR SUPPORTS. (1-15-10) (FA 1-21-10) (7-10)

SUBARTICLE 415-5.13(Pages 438-439) is deleted and the following substituted

415-5.13 Bar Supports:

415-5.13.1 General: Provide reinforcing steel bar supports manufactured in accordance with all requirements of the CRSI Manual of Standard Practice. Use bar supports of adequate strength to withstand a 300 pound concentrated load applied as directed by the State Materials Office without permanent deformation or breakage, with the deformation under a 300 pound load being less than 5% of the support height.

Ensure that no more than 5% of the reinforcing steel bar supports exhibit unsatisfactory performance, breakage, or permanent deformation during rebar tying and/or concrete placement operations. If a bar support does not achieve this level of performance, reduce the average spacing between bar supports by 15%, or remove that product from use on the job.

Ensure that bar supports do not move during concrete placing operations. To prevent movement, tie supports to the reinforcing steel.

When using bar supports on corrugated metal stay-in-place forms, use supports specifically designed for the form being used.

For structural elements located in extremely aggressive environments, do not use metal bar supports in contact with forms or floor surfaces to support reinforcing steel.

415-5.13.2 Metal Bar Supports: For metal bar supports in contact with steel stay-in-place forms and metal bar supports in contact with boundary surfaces of concrete to be cast, provide supports constructed with molded plastic legs or plastic protected steel legs. Do not allow any portion of the bar support other than the molded plastic leg or plastic protected portion of the steel leg to be closer than 1/2 inch from the boundary surface of concrete to be cast.

Certify that all metal bar supports meet the following requirements:

(1) That they are manufactured from cold drawn steel wire in accordance with the wire sizes and geometrical dimensions shown in the CRSI Manual of Standard Practice, Chapter 3, Table II.

(2) That the plastic used for protection of the steel legs has a thickness of 3/32 inch or greater at points of contact with the form work.

Provide plastic protection by a dipping operation, by adding premolded plastic tips to the legs of the support or by molding plastic to the top wire of the support. Ensure that the plastic material used for protection of steel legs does not chip, crack, deform, or peel under ordinary job conditions. Provide molded plastic legs that have sufficient strength to carry the weight of the supported reinforcing steel in its required position without deformation and relaxation under job conditions.

415-5.13.3 Plastic Bar Supports and Spacers: Use non-stackable bar supports and spacers comprised of either reinforced or non-reinforced virgin or recycled plastic. Bar supports shall be able to meet the concentrated load requirements of 415-5.13.1 within a working temperature range of 20 to 150°F. Spacers shall be able to withstand a 50 pound concentrated load applied as directed by the State Materials Office without bar slippage, permanent deformation or breakage within a working temperature range of 20 to 150°F with the deformation under a 50 pound load being less than 5% of the support height.

All plastic rebar supports shall have a maximum water absorption of 0.5% at 14 days, as per ASTM D 570.

Protect plastic rebar supports from exposure to sunlight until placed in the form. Mold plastic rebar supports in a configuration which does not restrict concrete flow and consolidation around and under the rebar support. Do not use continuous legs or rails on concrete surfaces.

Due to the wide range of applications and heights, ensure that the manufacturer additionally certifies all plastic bar supports for 2 inch, 3 inch, 4 inch and 4 1/2 inch heights.

Provide each individual bar support with an identification number unique to the particular model permanently marked on the surface as included in the Qualified Products List.

415-5.13.4 Plastic Bar Supports and Wheel Spacers for Drilled Shafts: Wheel spacers shall be able to withstand a 500 pound concentrated load applied as directed by the State Materials Office without bar slippage, permanent deformation or breakage at room temperature with the deformation under a 500 pound load being less than 5% of the support height. The perimeter surface of the wheel spacer shall be smooth.

Bottom bolsters shall be able to withstand a 1000 pound concentrated load without permanent deformation or breakage at room temperature with the deformation under a 1000 pound load being less than 5% of the support height.

All plastic rebar supports shall have a maximum water absorption of 0.5% at 14 days, as per ASTM D 570.

415-5.13.5 Qualified Products List: Use plastic bar supports and spacers listed on the Department's Qualified Products List. Manufacturers seeking evaluation of products for inclusion on the Qualified Products List must submit an application in accordance with 6-1 and include certified test reports from an independent laboratory showing that the plastic bar supports and spacers meet all the requirements specified herein. Plastic bar supports and spacers made of recycled plastic products must meet the additional requirements of Section 972.

443 FRENCH DRAINS.
(REV 6-4-10) (FA 8-17-10) (1-11)

SUBARTICLE 443-2.3 (Page 464) is deleted and the following substituted:

443-2.3 Select Fill: Use select fill meeting the requirements of either Section 911, 913, 913A or 915.

ARTICLE 443-5 (Page 464) is deleted and the following substituted:

443-5 Placing Coarse Aggregate and Backfilling.

After placing the pipe and without disturbing the pipe, carefully place the coarse aggregate around the pipe to a depth shown in the plans. Fold the filter fabric over the coarse aggregate. Backfill and compact as described below.

443-5.1 French Drains Under Pavement: Fill the area above the coarse aggregate with select fill material meeting the requirements of this Section. Place and compact the select fill according to the requirements for pipe as specified in Section 125. The Department will allow use of additional coarse aggregate over the top of the pipe instead of select fill material. In this case, the filter fabric shall be extended to wrap the additional coarse aggregate. The top of the coarse aggregate shall not be higher than the bottom of the base, unless shown in the plans. The Department will not pay additional costs associated with substituting coarse aggregate for select fill.

443-5.2 French Drains not Under Pavement: Fill and compact the area above the coarse aggregate according to the requirements for pipe in Section 125, unless specific procedures are described in the plans as specified in Section 125.

ARTICLE 443-6 (Page 464) is deleted and the following substituted:

443-6 Method of Measurement.

The quantity of French Drains to be paid for under this Section will be the length in feet, measured in place, completed and accepted as specified on Design Standards, Index No. 285 for French Drains.

ARTICLE 443-7 (Pages 464 – 465) is deleted and the following substituted:

443-7 Basis of Payment.

The quantities determined as provided above will be paid for at the Contract unit price per foot for French Drains. Such prices and payments will be full compensation for all the work specified in this Section and will include all materials and all excavation, and will also include sheeting or shoring, if required, the disposal of surplus material, pavement restoration,

backfilling and tamping, but will not include payment for items paid for elsewhere in the specifications.

Payment shall be made under:

Item No. 443- 70- French Drains - per foot.

446 EDGEDRAIN (DRAINCRETE) – CONTROL OF QUALITY. (REV 1-15-10) (2-19-10) (7-10)

ARTICLE 446-3 (Pages 438 – 439) is deleted and the following substituted:

446-3 Control of Quality.

446-3.1 Concrete Design Mix: Submit the proposed design mix prior to production, on the “Concrete Mix Design” form, for the Engineer’s approval. Use only draincrete design mixes having prior approval of the Engineer. Do not change the design mix component materials except as per 446-3.2.

The Department will verify the proposed mix design and may witness the trial batching. Meet the unit weight requirements as determined in accordance with FM 5-530, and the drain rate in accordance with FM 5-570. Also, provide one of the following with the design mix submittal:

(1) Evidence from three sets of production data, either from Department acceptance tests or independently verifiable commercial mixes, that draincrete produced in accordance with the proposed design mix meets the requirements of this Section.

(2) Test data from a single trial batch of 0.10 yd³ minimum is required, which demonstrates that the draincrete produced using the proposed mix, designated ingredients, and designated water-cement ratio meets the requirements of this Section.

446-3.2 Batch Adjustment - Materials: Meet the theoretical yield requirements of the approved mix design. Inform the Engineer of any adjustments to the approved mix design. Note any batch adjustments and record the actual quantities incorporated into the mix, on the concrete “Delivery Ticket/Certification” form.

446-3.3 Delivery Certification: Furnish to the Engineer a complete “Delivery Ticket/Certification” form with each batch of draincrete prior to unloading at the site.

450 PRECAST PRESTRESSED CONCRETE CONSTRUCTION. (REV 7-26-10) (FA 7-29-10) (1-11)

SUBARTICLE 450-9.2 (Page 482 – 483) is deleted and the following substituted:

450-9.2 Other Embedded Materials:

450-9.2.1 Inserts and Lifting Devices:

450-9.2.1.1 Placement: Locate inserts and lifting devices in accordance with the tolerances listed in 450-2.1.

450-9.2.1.2 Corrosion Protection: Provide corrosion protection for embedded metal lifting devices that would remain exposed after construction.

After lifting operations using recessed metal lifting devices are complete, backfill block-outs with a Type F epoxy compound meeting the requirements of Section 926 for a minimum distance of 2 inches beyond the perimeter of the metal device as measured parallel to the exposed concrete surface. If the block-out extends less than 2 inches beyond the perimeter of the metal device, extend the epoxy compound beyond the block-out along the concrete surface. If Type 304 or 316 stainless steel lifting devices are used, non-shrink grout meeting the requirements of Section 934 may be used to backfill the block-out within its limits.

After lifting operations using flush or protruding metal lifting devices are complete, cut the lifting devices back to a minimum depth of 1 inch below the concrete surface and patch with a Type F epoxy compound meeting the requirements of Section 926. For all square prestressed piling, concrete sheet piling and concrete poles, cut and patch lifting devices before transporting from the casting yard.

450-9.2.2 Placement of Bearing Assemblies: Set bearing assemblies designed to transmit reaction forces to the concrete in the position shown in the plans. Place bearing plate assemblies or shoes which are to be cast in a product within appropriate tolerances as provided in 450-2.1. Check the assemblies for position after stripping from the forms.

SUBARTICLE 450-10.3.2.3 (Page 484) is deleted and the following substituted:

450-10.3.2.3 All Beams 63 Inches or Deeper: Place concrete in a minimum of three horizontal layers. The thickness of the first layer will be such that the top of the concrete is slightly above the top of the bottom flange. The thickness of the second layer will be such that the top of the concrete is slightly above the bottom of the top flange. Fill the beam forms by the last layer.

SUBARTICLE 450-12.4 (Page 492) is deleted and the following substituted:

450-12.4 Bearing Areas: Consider the bearing area to extend from the end of the product to 3 inches beyond the edge of the bearing contact area for the full product width.

Do not allow the bearing plate or bearing area plane of precast prestressed concrete beam and slab units to deviate from a true plane by more than 1/8 inch when tested in all directions 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 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.

455 STRUCTURES FOUNDATIONS.
(REV 6-14-10) (FA 7-29-10) (1-11)

SUBARTICLE 455-7.5 (Page 544) is deleted and the following substituted:

455-7.5 Preparation for Transportation: Cut any strands protruding beyond the ends of the pile flush with the surface of the concrete using an abrasive cutting blade before transporting the piles from the casting yard.

Cut and patch the metal lifting devices in accordance with 450-9.2.1.

SUBARTICLE 455-16.4 (Pages 570 and 571) is deleted and the following substituted:

455-16.4 Cross-Hole Sonic Logging (CSL) Tubes: Install CSL access tubes full length in all drilled shafts from the tip of shaft to a point high enough above top of shaft to allow cross-hole-sonic-logging testing, but not less than 30 inches above the top of the drilled shaft, ground surface or water surface, whichever is higher. Equally space tubes around circumference of drilled shaft. Securely tie access tubes to the inside of the reinforcing cage and align tubes to be parallel to the vertical axis of the center of the cage. Access tubes must be NPS 1 1/2 Schedule 40 black iron or steel (not galvanized) pipe. Ensure that the CSL access tubes are free from loose rust, scale, dirt, paint, oil and other foreign material. Couple tubes as required with threaded couplers, such that inside of tube remains flush. Seal the bottom and top of the tubes with threaded caps. The tubes, joints and bottom caps shall be watertight. Seal the top of the tubes with lubricated, threaded caps sufficient to prevent the intrusion of foreign materials. Stiffen the cage sufficiently to prevent damage or misalignment of access tubes during the lifting and installation of the cage. Repair or replace any unserviceable tube prior to concreting. Exercise care in removing the caps from the top of the tubes after installation so as not to apply excess torque, hammering or other stress which could break the bond between the tubes and the concrete.

Provide the following number (rounded up to the next whole number of tubes) and configuration of cross-hole sonic logging access tubes in each drilled shaft based on the diameter of the shaft.

Shaft Diameter	Number of Tubes Required	Configuration around the inside of Circular Reinforcing Cage
36 to 48 inches	4	90 degrees apart
Greater than 48 inches	1 tube per foot of Shaft Diameter	360 degrees divided by the Number of Tubes

Insert simulated or mock probes in each cross-hole-sonic access tube prior to concreting to ensure the serviceability of the tube. Fill access tubes with clean potable water and recap prior to concreting. Repair or replace any leaking, misaligned or damaged tubes as in a manner acceptable to the Engineer prior to concreting.

For drilled shaft foundations requiring anchor bolts, verify CSL access tubes will not interfere with anchor bolt installation before excavating the shaft. When CSL access tube locations conflict with anchor bolt locations, move the CSL access tube location +/- two inches

along the inner circumference of the reinforcing cage. Notify the Engineer before excavating the shaft if the CSL access tube locations cannot be moved out of conflict with anchor bolt locations.

SUBARTICLE 455-17.6.1.1 (Page 573) is deleted and the following substituted:

455-17.6.1.1 Equipment: Furnish Cross-Hole-Sonic logging test equipment as follows:

1. Include ultrasonic transmitter and receiver probes for 1.5 inch I.D. pipe which produce measurements with consistent signal strength and arrival time in uniform, good quality concrete with all tube spacings on the project.
2. Include a microprocessor based data acquisition system for display, storage, and transfer of data. Graphically display first pulse Arrival Time (FAT) during data acquisition.
3. Electronically measure and record the relative position (depth) of the probes in the tubes with each CSL signal.
4. Print the CSL logs for report presentation.
5. Provide report quality plots of CSL measurements that identify each individual test.
6. Electronically store each CSL log in digital format, with shaft identification, date, time and test details, including the transmitter and receiver gain.

460 STRUCTURAL STEEL AND MISCELLANEOUS METALS (REV 5-18-10) (FA 6-1-10) (1-11)

SUBARTICLE 460-7.6 (Page 624) is deleted and the following substituted:

460-7.6 Tightening of Anchor Bolt/Rod Nuts:

460-7.6.1 Fixed and Expansion Pot Bearing: Tighten anchor bolts or rod nuts to a 'snug tight' condition such that the different mating surfaces (such as the top of concrete, neoprene and steel) are in firm contact. The nut or bolt is to be tight enough to develop friction between surfaces to prevent sliding, but not over-tightened that bulging or damage occurs in any of the mating materials.

460-7.6.2 Fixed and Expansion Bearings with Elastomeric Bearing Pads: Draw down the lower nut such that a total gap of 1/2 inch exists between the nut and bearing plate. Tighten a second nut of the same specification to a snug tight condition against the lower nut maintaining the required gap.

502 SHEAR CONNECTORS.
(REV 2-22-10) (FA 4-15-10) (1-11)

ARTICLE 502-1 (Page 635) is deleted and the following substituted:

502-1 Description.

Furnish and install welded shear connectors on steel beams and girders at locations shown in the Contract Documents. Field weld shear connectors located on the top flange only after the deck forms are in place. Installation of shear connectors in the fabrication plant is not permitted.

523 PATTERNED/TEXTURED PAVEMENT.
(REV 6-1-10) (FA 7-29-10) (1-11)

ARTICLE 523-2 (Pages 655 – 656) is deleted and the following substituted:

523-2 Materials.

523-2.1 Qualified Products List (QPL): Use only patterned/textured pavement products listed on the QPL. Meet manufacturer's specifications for all pattern/texture templates, coating and coloring materials. Use only material that is delivered to the job site in sealed containers bearing the manufacturer's original labels.

Material coatings used to achieve the pattern/texture and/or color shall produce an adherent, weather resistant, skid resistant surface capable of resisting deformation to traffic. Surface marking materials must meet the requirements of this Specification and Section 971 with the following exceptions:

1. Color and reflectivity requirements do not apply. Surfaces shall not be made retroreflective.
2. Requirements for minimum set to bear traffic time, do not apply. Do not open to traffic until the coating material has sufficiently dried or cured and is ready to withstand traffic.
3. For thermoplastic materials, the requirements for alkyd based materials only in 971-5.1 and minimum binder content of 971-5.2, do not apply.
4. For thermoplastic materials, the indentation resistance requirements and minimum flashpoint requirements of 971-5.5, do not apply.

Manufacturers seeking approval of their product for inclusion on the QPL must submit an application in accordance with Section 6 along with the following documentation:

1. Manufacturer's specifications and procedures for materials and installation.
2. Manufacturer's Laboratory test data from an independent laboratory verifying the material meets the requirements of this Section.
3. Test data from an independent source verifying that the patterned/textured pavement installed in accordance with the manufacturer's specifications and procedures has been tested in accordance with either the ASTM E-274, Skid Resistance of Paved Surfaces using a standard ribbed full Scale Tire at a speed of 40 mph (FN40R), and has a minimum FN40R value of 35, or ASTM E-1911, Measuring Paved Surface Frictional Properties

Using the Dynamic Friction Tester, at a speed of 40 mph (DFT40), and has a minimum DFT40 value of 40.

523-2.2 Performance Requirements: QPL approval will be contingent on a field service test demonstrating that the imprinted texture and coating materials meet the following performance measures at the end of three years from opening to traffic:

1. The imprint must maintain a depth of 50% of the original installed depth and width.

2. Wearing of the material coating shall not expose more than 15% of the underlying surface area.

3. Friction performance of patterned/textured pavement materials must meet or exceed one of the following test method values:

(a) FN40R value of 35 in accordance with ASTM E-274; or,

(b) DFT40 value of 40 in accordance with ASTM E-1911

The field service test installation shall be within a marked crosswalk on a roadway with an ADT of 8,000 to 12,000 vehicles per day per lane, approved by the Department. The test installation shall be a minimum six feet wide and extend from pavement edge to pavement edge across all traffic lanes and shoulder pavement at the crosswalk location. The test installation will be tested in accordance with FM 5-592.

524 CONCRETE DITCH AND SLOPE PAVEMENT.

(REV 8-13-09) (10-6-09) (7-10)

ARTICLE 524-2 (PAGE 657) is deleted and the following substituted:

524-2 Materials.

Concrete.....	Section 347
Preformed Expansion Joint Material and Hot Poured Sealer	
.....	Section 932
Filter Fabric	Section 985
Reinforcing Steel.....	Section 415

ARTICLE 524-9 (PAGE S 658 – 659) is deleted and the following substituted:

524-9 Method of Measurement.

524-9.1 Concrete Ditch and Slope Pavement: The quantities to be paid for Concrete Ditch Pavement and Concrete Slope Pavement will be the plan quantity, in square yards, completed and accepted. Where the plans show headers or cut-off walls at the end or edge of the pavement, the volume of the additional thickness of pavement that constitutes the headers, calculated in accordance with plan dimensions, will be converted into equivalent square yards of standard thickness pavement and included in the quantity to be paid for.

No deduction will be made for any areas occupied by manholes, inlets, or other drainage structures or by public utility appurtenances within the pavement area. The square yard quantity includes any ditch blocks with ditch or slope pavement on top. When steel reinforcement is called for in the plans, payment will be included in the square yard item.

524-9.2 Concrete Core Ditch Blocks: The quantity to be paid for Concrete Core Ditch Blocks will be the plan quantity of concrete, in cubic yards, completed and accepted. When steel reinforcement is called for in the plans, payment will be included in the cubic yard pay item. The cubic yard pay item includes any ditch block within a grass or earth ditch, without other pavement on top.

ARTICLE 524-10 (PAGE 659) is deleted and the following substituted:

524-10 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, including all earthwork, skimmers, and incidental materials necessary to complete the work.

Payment will be made under:

- | | | |
|---------------|----|--|
| Item No. 524- | 1- | Concrete Ditch Pavement - per square yard. |
| Item No. 524- | 2- | Concrete Slope Pavement - per square yard. |
| Item No. 524- | 3- | Concrete Core Ditch Block- per cubic yard. |

527 DETECTABLE WARNINGS ON WALKING SURFACES.
(REV 7-6-09) (FA 7-10-09) (1-10)

SECTION 527 (Pages 662-664) is deleted and the following substituted:

SECTION 527
DETECTABLE WARNINGS ON WALKING SURFACES

527-1 Description.

Furnish and install Detectable Warning devices on newly constructed and/or existing concrete or asphalt walking surfaces (curb ramps, sidewalks, shared-use paths, etc.) constructed in accordance with the Design Standards Index No. 304.

527-2 Materials.

527-2.1 Detectable Warning: Provide Detectable Warnings in accordance with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) Section 4.29.2 - Detectable Warnings on Walking Surfaces. Use Detectable Warnings of materials intended for exterior use subject to routine pedestrian traffic and occasional vehicular traffic. Use Detectable Warnings with size and pattern shown in the plans comprised of truncated domes aligned in parallel rows in accordance with Index No. 304 of the Design Standards. Do not use detectable warnings with a diagonal pattern.

527-2.1.1 Preformed Materials: Use Detectable Warnings consisting of weather-resistant tiles, pavers or mats that are adhered to concrete or asphalt substrates and have mechanical bond or fasteners, or torch-applied preformed thermoplastic. Preformed products may be used only if listed on the Qualified Products List in accordance with 527-2.4.

527-2.1.2 Field-Formed Materials: Use Detectable Warnings applied as a secondary application to the substrate. Products applied as a secondary application may be used only if listed on the Qualified Products List in accordance with 527-2.4.

527-2.2 Material Properties: Provide Detectable Warnings that meet the following minimum material property requirements when tested in accordance with the indicated Standard appropriate to the material.

PROPERTY	STANDARD	MINIMUM THRESHOLD
Slip Resistance	ASTM C1028, F609, F1677, F1678, F1679; E303	Dry Coefficient of Friction – 0.8 min. and Wet Coefficient of Friction – 0.65 min.; Or 35 BPN (include recessed areas between truncated domes)
Wear Resistance	ASTM C501	Average wear depth on dome ≤ 0.030 " after 1000 abrasion cycles.
Water Absorption ¹	ASTM D570	Not to exceed 5%.
Adhesion/Bond Strength	ASTM C482	No adhesion failure
Non-Hazardous Classification	RCRA Subtitle C	Non-Hazardous

¹ Applies only to pavers and tiles consisting of plastic materials.

527-2.3 Color/Contrast: Use safety yellow, brick red or black colored Detectable Warnings on concrete walking surfaces. Use safety yellow colored Detectable Warnings on asphalt walking surfaces. Acceptable Detectable Warnings as listed on the Qualified Products List will meet the following criteria for a duration of three years.

COLOR	LIGHT REFLECTANCE VALUES (LRV) CAP Y*
Safety Yellow	25 – 45
Brick Red	5 – 15
Black	0 – 5

*When measured with a spectrophotometer

527-2.4 Qualified Products List: Methods or products used to form Detectable Warnings in wet concrete will not be permitted. Use Detectable Warnings listed on the Department Qualified Products List (QPL). Manufacturers of Detectable Warnings seeking evaluation of their product shall submit an application in accordance with Section 6. Manufacturers must demonstrate performance in accordance with the requirements of these Specifications and with the acceptance criteria detailed in Index No. 304 of the Design Standards. Submit Applications that include certified test reports from an independent laboratory that shows the Detectable Warning meets the material properties and all requirements specified herein. Application must include manufacturer's installation drawings that describe detailed quality control requirements for installation including, but not limited to: special materials and/or equipment; recommendations for cleaning/preparing substrate surfaces; bonding method describing thickness, spread rate and/or curing time(s) of grout or adhesive materials; mechanical anchorage; and protection of Detectable Warning materials during set-up/curing period.

In addition, manufacturer's drawings must provide recommended quality control procedures for touch-up and repair of localized areas of installations, for compliance with the acceptance criteria provided in Index No. 304 of the Design Standards.

527-3 Installation Procedures.

527-3.1 Surface Preparation and Installation: Prepare the surface in accordance with the Detectable Warning manufacturer's recommendations. Install Detectable Warnings in accordance with the manufacturer's instructions, using materials and/or equipment recommended and approved by the Detectable Warning manufacturer. Ensure that all installations are made in accordance with the manufacturer's installation drawings referenced by the QPL.

527-4 Method of Measurement.

Detectable Warnings applied to newly constructed walking surfaces will be included in the cost of the walking surface. Detectable Warnings applied to existing walking surfaces will be paid per each location where Detectable Warnings are furnished, installed and accepted.

527-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all labor, surface preparation, materials and incidentals necessary to complete the work for Detectable Warnings installed on existing walking surfaces.

Payment will be made under:

Item No. 527- 1- Detectable Warnings on Existing Walking Surfaces - each.

534 SOUND BARRIERS.

(REV 7-19-10) (FA 7-29-10) (1-11)

Section 534 (Pages 669 – 672) is deleted and the following substituted:

SECTION 534 SOUND BARRIERS

534-1 Description.

Furnish and install sound barriers with pile, posts and panels constructed in accordance with Design Standards Index Nos. 5200 thru 5207 or with pre-approved alternatives listed on the Department's Qualified Products List (QPL), unless the Plans otherwise indicate limitations based on specific design or aesthetic criteria unique to the project.

Obtain Precast Concrete Sound Barrier components from a manufacturing 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.

534-2 Materials.

Meet the following requirements:

Portland Cement ConcreteSection 346

Reinforcing SteelSection 415

534-3 Component Construction.

Construct concrete components in accordance with Section 400. Precast wall components are produced using certification acceptance; therefore, assume responsibility for performance of all quality control testing and inspections required by Sections 346 and 400 for the precast

component construction. Perform all Quality Control Testing using Construction Training and Qualification Program (CTQP) qualified testing personnel. Perform compressive strength testing in a laboratory inspected by the Cement and Concrete Reference Laboratory (CCRL) or Construction Materials Engineering Council (CMEC), with all deficiencies corrected.

Ensure that each panel and post is permanently and clearly marked by ink stamping the tongue and groove portion of the panel and post. Mark the panel with the panel type, date cast, project number, manufacturer's name or symbol and the post with the date cast, project number and manufacturer's name or symbol.

534-4 Approved Proprietary Sound Barrier Panels and Systems.

Proprietary panels or systems listed on the QPL that have been pre-determined by the Engineer to be in compliance with the project design and aesthetic criteria shown in the Plans may be used.

Manufacturers seeking evaluation of products for inclusion on the QPL must submit an application in accordance with Section 6, independently certified test reports, and written certification that the product meets the requirements of this Section, Design Standards Index Nos. 5200 thru 5207, and the Sound Barrier Evaluation Criteria contained in the State Structures Design Office's Structures Manual.

Provide written certification from the manufacturer of the panels that the product meets the requirements of this Section and is the same product listed on the QPL.

534-5 Shop Drawing Submittal.

Do not include shop drawings of the basic panel details, submit only the information requested. Submit shop drawings in accordance with Section 5, showing a plan and elevation of the sound walls with the following project specific information provided:

1. Begin and end wall stations with offsets
2. Horizontal and vertical alignments of the wall
3. Fire hose access hole locations
4. Drainage panel locations and type
5. Graphic details and graphic panel location
6. Panel locations
7. Post locations
8. Elevations of top of panel, bottom of panel, and panel joints
9. Existing and proposed ground elevations
10. Utility locations
11. Special post and panel details
12. Post and pile connection details
13. Post Cap Details
14. Lifting devices

534-6 Construction Methods.

A. Prior to beginning earthwork on the project, stake the wall location in the field, and establish the final ground line elevations at the base of the walls. Use these elevations to develop the shop drawings, including a complete elevation view of each wall indicating top and bottom elevations as well as the roadway grade. Protect the final ground elevations established in the field for the duration of the project, and do not adjust without prior approval of the Engineer.

Keep to a minimum the clearing and grubbing, and trimming of trees as necessary to construct the walls.

B. Do not mix wall types or colors at any one site. Install the walls in accordance with the Plans, and in accordance with shop drawings submitted to and approved by the Engineer. Secure joints and connections in such a manner as to be structurally sound and without visible openings in the system allowing sound transmission. Ensure metal walls do not produce a secondary source of noise transmission due to vibration.

C. Repair marred, chipped, scratched, or spalled areas of walls at no expense to the Department in accordance with the manufacturer's recommendations or at the Engineer's direction.

D. The Contractor may substitute welded for fixed bolt connections or vice versa on metal walls, where applicable, provided load calculations are submitted for the specific modified connection and uses a minimum safety factor of 3.0.

E. Place trench backfill for wall construction in accordance with 125-8. Use select materials for the trench backfill.

If, in the opinion of the Engineer, the trench is too narrow to compact, backfill the trench excavation with flowable fill meeting the requirements of Section 121 or concrete meeting the requirements of Section 346 or 347 to the satisfaction of the Engineer at no expense to the Department.

F. Dispose of all excess excavation in a manner satisfactory to the Engineer.

G. Keep right-of-way fence that is scheduled to be salvaged in place until completing the wall or, in the opinion of the Engineer, as long as possible.

H. After erecting the wall, leave the disturbed area in a finished condition at the direction of the Engineer, and grass or sod the area as indicated in the Plans.

I. Erection Tolerances:

1. Variation from plumb: plus or minus 1/4 inch/ post height
2. Panel alignment: plus or minus 1/4 inch
3. Top of panel elevation: plus or minus 3/4 inch
4. Elevation difference of adjacent panels: plus or minus 1/2 inch
5. Joint taper over panel length: plus or minus 1/2 inch
6. Top of collar elevation: plus or minus 3/4 inch

7. Post placement:

- a. Variation from specified location plus or minus 1/2 inch
- b. variation from specified elevation plus or minus 1/4 inch

8. Continuity of graphics, fracture fins, etc across joints: 1/4 inch

J. When building sound barriers on top of earth berms, construct the berms of fill material compacted to 95% of the maximum density as determined by AASHTO T 99.

K. Provide the concrete wall (Precast or Cast-in-Place) with a uniform color, pattern, and texture.

534-7 Test Wall.

Erect a test wall section not less than 50 feet in length before starting general wall construction at the project site. The Engineer will use the erection of the test wall to determine if the Contractor's methods and equipment are sufficient to produce a sound barrier that meets the requirements of the Contract Documents. The Contractor may revise his methods and equipment as necessary, at any time during the positioning of the test wall, in order to satisfactorily meet all

Contract requirements. Build the test wall at a permanent wall location, as directed by the Engineer. If the test wall does not meet the construction tolerances, remove and dispose of it at no expense to the Department. Include the cost of the test wall in the cost of the sound barrier.

534-8 Repairs or Rejection.

For precast concrete sound barrier components that have not been installed, evaluate cracks, spalls and other deficiencies in accordance with 450-12. Repair deficiencies in accordance with 450-13 or the plant's approved repair methods that are included as part of the QCP. Ensure that the original performance and durability of repaired sound barrier components are maintained. Use materials for concrete repair that will meet or exceed the strength requirement for the class of concrete used. Materials meeting the requirements of Section 930 may be substituted for non-shrink grout when required by 450-13. Precast concrete sound barrier components are subject to rejection if they fail to conform to any of the requirements after repair. For precast concrete sound barrier components that have been installed, the disposition of concrete cracks shall be in accordance with 400-21.

534-9 Method of Measurement.

The quantity to be paid for will be the plan quantity, in square feet, measured in place, completed and accepted, of the area bounded by the top of the top panel and the bottom of the bottom panel without deductions for openings in the panels, and the beginning to end limits shown in the control drawings.

534-10 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including but not limited to: furnishing all materials, labor, panels, special panels, posts, post caps, collars, reinforcing steel, foundations, drain holes, fire hose access holes, grating, neoprene pads, equipment, alignment pins, etc. necessary to construct the sound barriers. Include in this price, the cost of any charges for power stoppages, sound barrier wall realignments, special erection methods, etc. required to construct the wall.

Payment will be made under:

Item No. 534- 72- Sound Barrier - per square foot.

536 GUARDRAIL.

(REV 6-9-10) (FA 7-16-10) (1-11)

SUBARTICLE 536-2.4 (Page 674) is deleted and the following substituted:

536-2.4 Offset Blocks: Use guardrail offset blocks of either timber, steel, recycled plastic, or rubber, and of the sizes specified in the Design Standards.

Treat timber blocks in accordance with the requirements for posts in 955-5.3. Ensure that penetration of preservative is in accordance with requirements for round piles and fence posts in 955-6.2. For timber offset blocks, meet the requirements of the latest edition of the Southern Pine Inspection Bureau's Standard Grading Rules for Southern Pine Lumber, for No.1 grade timber. Dress all timber offset blocks on all four sides (S4S). Ensure that timber offset blocks do not vary more than 0.25 inch from the specified length.

Use rubber or recycled plastic blocks that have a minimum Durometer hardness of 50 (ASTM D 2240), show no cracking at the end of an ozone exposure of 100 plus or minus 10 pphm for 15 hours at 100°F (ASTM D 1149 mounting type A), do not exceed 15 points change in Durometer hardness in oven ageing for 70 hours at 158°F (ASTM D 573), and show no cutting or tearing under a 6,500 lb load applied through a guardrail section. Ensure that the blocks present a neat appearance and have plane surfaces. Provide rubber or recycled plastic blocks that are 6 inches wide, 8 inches deep and 14 inches high. Allow dimensional tolerances of plus or minus 5/8 inch in height, plus or minus 3/8 inch in width, and plus or minus 3/8 inch in depth.

Use recycled plastic offset blocks that meet the requirements of Section 972 and are listed on the Qualified Products List (QPL). Manufacturers seeking evaluation of their product shall submit an application in accordance with Section 6 and include certified test reports from an approved independent test laboratory that shows the material meets all the requirements of this Section and Section 972.

544 CRASH CUSHIONS.

(REV 6-17-10) (8-12-10) (1-11)

SECTION 544 (Pages 678 – 679) is deleted and the following substituted:

SECTION 544 CRASH CUSHIONS

544-1 Description.

Install redirective and non-redirective crash cushions (of the sizes and types designated in the plans. Redirective crash cushions are safety devices with capabilities to redirect the impacting vehicle over the full length of the device. Non-redirective crash cushions allow controlled penetration of the impacting vehicle over the full length of the device.

544-2 Qualified Products List (QPL).

Use crash cushions listed on the QPL. Manufacturers seeking evaluation of their crash cushions shall furnish certified test reports showing that their products meet all test requirements of NCHRP 350 or the Manual for Assessing Safety Hardware 2009 (MASH).

544-3 Construction.

Handle and install manufactured materials or articles in accordance with the manufacturer's instructions and the Design Standards.

Use attenuators delineated with a Type I Object Marker specified in Section 705 or sheeting in accordance with 990-2.

Perform repairs necessary due to defective material, work, or operations without additional cost to the Department.

Restore the attenuator damaged by the traveling public after the installation is completed, accepted and serving its intended purpose on an open section of bridge or roadway within 24 hours.

544-4 Compensation.

Price and payment will be full compensation for the complete system or module in place and accepted, including object marker or sheeting, and restoration of damaged attenuators.

Relocation of an existing attenuator system to a permanent location called for in the plans shall be paid for at the Contract unit price for relocating existing systems. Price and payment will be full compensation for relocating and reinstalling the system in accordance with the manufacturer's instructions and the Design Standards.

Payment will be made under:

- | | |
|-------------------|---------------------------------|
| Item No. 544- 74- | Relocate Crash Cushion, - each. |
| Item No. 544- 75- | Crash Cushion - each. |

546 RUMBLE STRIPS.

(REV 7-6-09) (FA 8-31-09) (1-10)

ARTICLE 546-2 (Page 679) is deleted and the following substituted:

546-2 Materials for Raised Rumble Strips.

Construct Raised Rumble Strips using one of the following:

(a) Thermoplastic materials listed on the Qualified Products List (QPL), meeting the requirements of 971-1 and 971-6. Ensure that the material used can be restored to its original dimensions by using a self bonding overlay meeting these requirements. Submit a certified test report to the Engineer indicating that the materials meet all requirements specified.

Before applying thermoplastic materials on portland cement concrete surfaces, apply a primer sealer recommended by the manufacturer.

(b) Any plant-mixed hot bituminous mixture meeting the requirements of a job-mix formula issued by the Department, except open-graded friction course.

Prior to the application of any plant-mixed hot bituminous material, apply a tack coat meeting the requirements of 300-2.3.

The mixture will be accepted on the basis of visual inspection by the Engineer with no further testing required.

548 RETAINING WALL SYSTEMS

(REV 5-17-10) (FA 6-1-10) (1-11)

ARTICLE 548-2 (Pages 681 – 683) is deleted and the following substituted:

548-2 Materials.

Purchase the precast components, soil reinforcement, attachment devices, joint filler, filter fabric, and all necessary incidentals from the wall supplier chosen.

548-2.1 Concrete: Ensure that concrete utilized for wall components is as specified in the Contract Documents and is consistent with the concrete class, environmental classification and admixture requirements for durability as stated in the Contract Documents. Produce and supply concrete for all wall components meeting the requirements of Section 346.

Produce and supply concrete for the leveling pad meeting the requirements of Section 347. Assume responsibility for performance of all testing required by Section 346. Use Department approved mix designs.

548-2.2 Reinforcing Steel: Meet the requirements of Section 931 utilizing Grade 60 (Black) steel.

548-2.3 Backfill Reinforcement: For walls utilizing backfill reinforcement, use reinforcement consisting of steel wire mesh, metal strips or structural geosynthetics as required for the wall system chosen.

Use steel wire mesh and embedded loops shop fabricated from cold drawn steel wire meeting the minimum requirements of ASTM A 82, and weld into the finished mesh fabric in accordance with ASTM A 185. Use steel strips hot rolled from bars to the required shape and dimensions with physical and mechanical properties meeting ASTM A 572 Grade 65 or as shown in the Contract Documents. Use shop-fabricated hot rolled steel tie straps meeting the minimum requirements of ASTM A 1011/A 1011 M, Grade 50, or as shown in the Contract Documents.

Ensure that steel reinforcing strips, tie strips, reinforcing mesh and connectors used in permanent walls are galvanized in accordance with ASTM A 123 or ASTM A 153, as applicable.

Use structural geosynthetics made of polypropylene, select high density polyethylene or high-tenacity polyester fibers having cross-sections sufficient to permit significant mechanical interlock with the backfill. Use geosynthetics having a high tensile modulus in relation to the backfill. Use geosynthetics having high resistance to deformation under sustained long term design load while in service and resistant to ultraviolet degradation, to damage under normal construction practices and to all forms of biological or chemical degradation normally encountered in the material being reinforced. Do not use uncoated polyester (PET) reinforcements or reinforcements weakened or damaged by high pH environments within the flowable fill.

Store the geosynthetics in conditions above 20°F and not greater than 140°F. Prevent mud, wet cement, epoxy, and like materials from coming into contact with and affixing to the geosynthetic material. Rolled geosynthetic may be laid flat or stood on end for storage. Cover the geosynthetic and protect from sunlight prior to placement in the wall system.

Carefully inspect all reinforcement, steel and geosynthetics to ensure they are the proper size and free from defects that may impair their strength and durability.

548-2.4 Attachment Devices: Use backfill reinforcement attachment devices as required by the wall system chosen.

548-2.5 Joint Materials and Filter Fabrics:

548-2.5.1 Horizontal Joint Filler: Use elastomeric or polymeric pads/fillers in all horizontal joints between precast components as recommended by the wall manufacturer. Ensure that the pads are of sufficient size and hardness to limit vertical stresses on the pad and concrete surface and to prevent concrete to concrete contact at the joints.

548-2.5.2 Joint Covers: Cover joints and other wall openings with geotextile fabric meeting the requirements of Section 985 and Type D-5 of the Design Standards, Index No. 199. Apply an adhesive approved by the Engineer to the back of the precast component for attachment of the fabric material.

548-2.5.3 Alignment Pins: Ensure that pins used to align the precast components during construction are of the size, shape and material required for the wall system chosen.

548-2.6 Backfill Material:

548-2.6.1 General: Provide compacted select backfill or flowable fill within the retaining wall volume when the option for flowable fill is shown in the plans. The retaining wall volume is defined to extend from the top of the leveling pad or footing, or bottom of walls which do not have footing or leveling pads, to the finish grade line and from the face of the wall to a vertical plane passing through the end of the extreme wall component (straps, counterforts, etc.) plus 1 foot.

548-2.6.2 Compacted Select Backfill: Meet the requirements of Sections 105 and 120 except as noted within this Section. Have the backfill material tested for every soil type for pH, resistivity, sulfate and chloride content by a Department approved independent testing laboratory prior to placement. Provide certification to the Engineer, that the results have met the requirements of this Section and are signed and sealed by a Professional Engineer, registered in the State of Florida.

For constructing the retaining wall volume, do not use backfill material containing more than 2.0% by weight of organic material, as determined by FM 1-T 267 and by averaging the test results for three randomly selected samples from each stratum or stockpile of a particular material. If an individual test value of the three samples exceeds 3%, the stratum or stockpile will not be suitable for constructing the retaining wall volume.

Ensure that the material is non-plastic as determined by AASHTO T 90 and the liquid limit as determined by AASHTO T 89 is less than 15. The pH, as determined by FM 5-550, shall not be lower than five and not higher than nine.

Use backfill for walls using soil reinforcements that meets the following gradation limits determined in accordance with AASHTO T 27 and FM 1-T 011:

Sieve Size	Percent Passing
3 1/2 inches	100
3/4 inch	70-100
No. 4	30-100
No. 40	15-100
No. 100	0-65
No. 200	0-12

In addition, for permanent walls utilizing metallic soil reinforcement, use backfill that meets the following electro-chemical test criteria for determining corrosiveness:

Criteria	Test Method
Resistivity: > 3000 ohm -cm	FM 5-551
Soluble sulfate content: < 200 PPM	FM 5-553
Soluble chloride content < 100 PPM	FM 5-552

For walls not using soil reinforcement, use backfill that meets the following gradation limits determined in accordance with AASHTO T 27 and FM 1-T 011:

Sieve Size	Percent Passing
3 1/2 inches	100
No. 200	0-12

548-2.6.3 Flowable Fill: Meet the requirements of Section 121 except as noted within this Section and the plans.

SUBARTICLE 548-6.5 (Page 686) is deleted and the following substituted:

548-6.5 Backfill Placement:

548-6.5.1 Compacted Select Backfill: Perform work in accordance with an approved Quality Control Plan (QCP) meeting the requirements of 105-3. A LOT is defined as a single lift of finished embankment not to exceed 500 feet in length. Isolated compaction operations will be considered as separate LOTs. For multiple phase construction, a LOT will not extend beyond the limits of the phase.

Place the backfill closely following the erection of each course of precast components or soil reinforcement layers and spread by moving the machinery parallel to the wall face. Do not allow equipment heavier than 8 tons closer than 3 feet behind the wall face. Place backfill in a manner to avoid any damage or disturbance to the wall materials or misalignment of the facing materials. Remove and replace any wall materials which become damaged or disturbed during backfill placement at no cost to the Department, or correct as directed by the Engineer. Remove and reconstruct any misalignment or distortion of the wall facing due to placement of backfill outside the limits of this specification at no cost to the Department.

Sheepfoot, grid rollers or other types of equipment employing a foot are not allowed. Achieve compaction within 3 feet of the back of the wall face using a power operated roller or plate weighing less than 1,000 lbs. At a distance greater than 3 feet from the back of the wall, a vibratory roller may be used, provided that the frequency and amplitude combined with bulk weight of the roller has performed satisfactorily at a trial section of the same type of wall. A smooth wheel or rubber tire roller is considered adequate. Ensure that the maximum lift thickness after compaction does not exceed 6 inches. Decrease the lift thickness if necessary, to obtain specified density.

Perform backfill compaction in a way that the compactor moves in a direction parallel to the wall face and proceeds from a distance not less than 3 feet behind the wall face toward the end of the soil reinforcement element.

Ensure that the moisture content of the backfill material prior to and during compaction is uniformly distributed throughout each layer of material. Use backfill material having a placement moisture content at the dry side of the Optimum Moisture content. To achieve the required compaction moisture content, use water that meets the requirements of Section 923. Do not use saltwater. Do not transport excessively moist backfill materials to the site for any reason. The Engineer will determine the Optimum Moisture Content in accordance with FM 5-521.

At the end of each day's operation, shape the last level of backfill to permit runoff of rainwater away from the wall face or provide a positive means of controlling run off away from the wall such as temporary pipe, etc.

548-6.5.2 Flowable Fill: Perform work in accordance with an approved Quality

Control Plan (QCP) meeting the requirements of 105-3. Metallic wall components (including metallic soil reinforcements) must not be in partial contact with the flowable fill. If the metallic components contact the flowable fill, the metallic components must be completely encapsulated by the flowable fill.

SUBARTICLE 548-10 (Page 689) is deleted and the following substituted:

548-10 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including the design of the wall system, excavation required specifically for wall construction below the normal roadway template, backfill reinforcement, leveling pad, footings, copings, fabric material, horizontal joint materials, alignment pins, repairs, labor, equipment, and other materials necessary to complete the wall in an acceptable manner as shown on the Contract drawings. The cost of backfill for the normal roadway template will be included in the cost of embankment or borrow excavation, as applicable.

Payment will be made under:

- | | |
|------------------|--|
| Item No. 548-12- | Retaining Wall System (Permanent) - per square foot. |
| Item No. 548-13- | Retaining Wall System (Temporary) - per square foot. |

550 FENCING

(REV 5-14-10) (FA 7-20-10) (1-11)

SUBARTICLE 550-3.1 (Page 690) is deleted and the following substituted:

550-3.1 Type A Fence (Farm Fence): Meet the requirements of Section 954 for timber posts and braces. For metal posts and braces, and for recycled plastic fence posts, meet the requirements of the Design Standards.

For the fabric and all other accessories, meet the requirements of the Design Standards.

555 DIRECTIONAL BORE.

(REV 6-22-10) (FA 7-29-10) (1-11)

ARTICLE 555-8 (Page 700-701) is deleted and following substituted:

555-8 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including furnishing and installing pipe or conduit, from plan point of beginning to plan point of ending at plan depth, removal of excavated materials and spoils, removal and disposal of drilling fluids, backfilling, and complete restoration of the site. Bundled product in a single bore will be paid for as a single bore based on the required drill bit head or back reamer head size. Separate payment shall not be made for individual products in a bundle.

The installation and attachment of tracking conductors (wire or tape) will be included in the cost of the bore and will not be paid for separately.

No payment will be made for failed bore paths, injection of excavatable flowable fill, products taken out of service or incomplete installations.

No payment will be made for directional boring until a Bore Path Report has been delivered to the Engineer.

Payment will be made under:

Item No. 555- 1- Directional Bore - per foot of bore diameter.

560 COATING STRUCTURAL STEEL.

(REV 6-11-09) (FA 6-25-09) (1-10)

PAGE 714. The following new Section is added after Section 557:

SECTION 560 COATING STRUCTURAL STEEL

560-1 Description

Coat new structural steel in accordance with the requirements of this Section.

560-2 Materials.

560-2.1 Coating System: Use only coating products and systems meeting the requirements of Section 975 and listed on the Departments Qualified Products List (QPL).

Use Type M coal tar epoxy coatings meeting the requirements of Section 926 and listed on the Department's QPL for coating of permanent bulkhead sheet piles and H piles.

560-2.2 Thinners, Solvents and Cleaners: Use thinners, solvents and cleaners listed on the coating manufacturer's product data sheet.

560-2.3 Caulking: Use caulks that are paintable, compatible with the coating system and recommended by the coating manufacturer as part of the coating system.

560-2.4 Soluble Salts Test Kit: Use a soluble salts test kit in accordance with SSPC-Guide 15 utilizing a Class A retrieval method. Ensure the test sleeve or cell creates a sealed, encapsulated environment during ion extraction and is suitable for testing all structural steel surfaces.

560-2.5 Abrasives: Use properly sized abrasives to achieve the required cleanliness and anchor profile. Use abrasives meeting the requirements of SSPC-AB 1, Mineral and Slag Abrasives, SSPC-AB 2, Cleanliness of Recycled Ferrous Metallic Abrasives, or SSPC-AB 3, Newly Manufactured or Re-Manufactured Steel Abrasive and do not introduce any contamination that interferes with the coating application and performance.

Provide certification to the Engineer that the abrasives used meet the requirements of this Section and do not contain any chlorides and other salts.

For recycled abrasives, verify compliance with the conductivity and cleanliness requirements of SSPC-AB 2 after each recycling or more frequently if required by the Engineer. Select a sample from each recycling machine in use and conduct the water-soluble contaminant and oil content tests outlined in SSPC-AB 2 at least one time each week or more frequently if directed by the Engineer. Conduct the non-abrasive residue and lead content tests as directed by

the Engineer. If test results do not meet requirements, notify the Engineer immediately, remove and replace the abrasive, clean the recycling equipment, and conduct tests each day to confirm the equipment is functioning properly. Return to the weekly testing interval as directed by the Engineer.

560-2.6 Rust Preventative Compound: Use a Class 3 rust preventative compound meeting the requirements of Military Specification MIL-C-11796C, Corrosion Preventative Compound, Petrolatum, Hot Applied.

560-2.7 Storage: Store materials in conformance with the manufacturer's recommendations.

560-3 Equipment.

560-3.1 Compressed Air: Use a compressed air system capable of delivering clean, dry, continuous nozzle pressure to achieve the required surface cleanliness and profile or spray pattern. The system must comply with the instructions and recommendations of the manufacturer of the abrasive blasting system or coating application system.

560-3.2 Abrasive Blasting System: Design the blasting system to produce the specified cleanliness and profile.

560-3.3 Coating Application System: Use the coating application equipment approved by and in accordance with the Coating Manufacturer's technical data requirements.

560-4 Environmental, Health and Safety Requirements.

Isolate the work areas with containment devices, canvasses, tarpaulins or screens during all surface preparation and coating application operations. Dispose of all debris and waste products generated in accordance with all Federal, State and Local regulations.

560-5 Quality Control.

560-5.1 Shop Preparation and Application: Prior to applying coatings, provide a current Corporate Quality Control Plan approved by the American Institute of Steel Construction (AISC) under the Sophisticated Paint Endorsement program or SSPC under the SSPC-QP3 certification to the State Materials Office for approval.

560-5.2 Field Preparation and Application: Provide a current Corporate Quality Control Plan approved by SSPC under the SSPC-QP1 and/or SSPC-QP2 certifications as appropriate and a site specific Coating Quality Control Plan to the Engineer at least 14 calendar days prior to beginning coatings work. Do not begin coatings work until the site specific Coating Quality Control Plan has been approved by the Engineer.

560-5.3 Inspection: Ensure that all inspection equipment is maintained in accordance with the manufacturer's instructions, calibrated, and in good working condition. Ensure that all activities are observed and approved by a quality control coatings inspector meeting the requirements of this Section. Maintain daily inspection reports at the job site for review by the Engineer. Provide all daily inspection reports upon completion of the project to the Engineer or more frequently as requested by the Engineer.

560-6 Qualifications.

560-6.1 Shop: Provide documentation to the Engineer at least 14 days prior to beginning work that the shop performing any work in accordance with this Section is certified by AISC Sophisticated Paint Endorsement or by SSPC to the requirements of SSPC-QP3.

560-6.2 Field Contractor: Provide documentation to the Engineer at least 14 days prior to beginning work that the field contractor performing any work in accordance with this Section is certified by SSPC to the requirements of SSPC-QP1 and/or SSPC-QP2 as appropriate.

560-6.3 Quality Control Inspectors in the Shop and Field: Provide documentation to the Engineer that all personnel performing quality control inspections are certified at a minimum as a National Association of Corrosion Engineers (NACE) Coating Inspector Level I or a SSPC Level 1 Bridge Coating Inspector and that they report directly to a Quality Control Supervisor who is certified either as a NACE Coating Inspector Level 3 or a SSPC Level 2 Bridge Coating Inspector.

560-6.4 Certifications: Maintain certifications for the duration of the Contract. If the certifications expire, do not perform any work until certifications are reissued.

Notify the Engineer of any change in certification status.

560-7 Surface Preparation.

560-7.1 General: Ensure all surfaces to be coated are clean, dry, and free from oil, grease, dirt, dust, soluble salts, corrosion, peeling coating, caulking, weld spatter, mill scale and any other surface contaminants. Prepare all surfaces that will become inaccessible after fabrication, erection, or installation while accessible. Sequence the surface preparations and coating operations so that freshly applied coatings will not be contaminated by dust or foreign matter. Protect all equipment and adjacent surfaces not to be coated from surface preparation operations. Protect working mechanisms against intrusion of abrasive. In the event that any rusting or contamination occurs after the completion of the surface preparation, prepare the surfaces again to the initial requirements. Perform surface preparation work only when the temperature of the steel surface is at least 5°F above the dew point temperature.

560-7.2 Mechanical Removal of Surface Defects: Break all corners resulting from sawing, burning, or shearing. In areas where burning has been used, remove the flame hardened surface of the steel to the extent necessary to achieve the required surface profile after abrasive blast cleaning. Remove all weld slag and weld spatter. Conduct all of this work in accordance with AASHTO/NSBA Steel Bridge Collaboration S 8.1.

560-7.3 Cleaning: Clean all steel surfaces in accordance with the requirements of SSPC-SP 1.

560-7.4 Washing: Wash all steel surfaces in accordance with the requirements of SSPC-SP 12.

560-7.5 Soluble Salts Detection and Removal: Determine the chloride, sulfate and nitrate concentrations on all steel surfaces using soluble salts test kits meeting the requirements of 560-2.4. Measure the concentration levels using the method described in SSPC-TU 4. Perform the tests after washing and after each applied coat of the coating system. Test three random locations in the first 1000 square feet and one random location for each subsequent 1000 square feet. Ensure the non-visible surface contaminant concentrations on blast-cleaned surfaces do not exceed the levels in SSPC-SP 12 Table A1 NV12 for chloride, soluble ferrous iron and sulfate and 10 µg/cm² for nitrate. When any concentration exceeds these levels rewash the entire surface area and retest. If additional washing does not reduce the concentration to the acceptable level, a surface treatment or water additive may be used. Use a surface treatment or water additive that is approved by the coating system supplier and the Engineer.

560-7.6 Abrasive Blast Cleaning: Prepare steel by abrasive blast cleaning to “Near-White” metal condition as defined in SSPC-SP 10. Use SSPC VIS 1 as an aid in establishing cleanliness. After abrasive blast cleaning, ensure the surface profile meets the requirements of

the coating manufacturer's product data sheet. Determine the surface profile using replica tape in accordance with ASTM D 4417, Method C.

Perform all abrasive blast cleaning within a containment system to ensure confinement of all particulates. Design the containment system to comply with all applicable Federal, State, and Local regulations. Ensure the abrasive blast cleaning does not produce holes, cause distortion, remove metal, or cause thinning of the substrate.

560-7.7 Hand and Power Tool Cleaning: Prepare steel by power and hand tool cleaning as defined in SSPC-SP 11, SSPC-SP 3, and SSPC-SP 2 for touch up and repair when approved by the Engineer. Use SSPC-VIS 3 as an aid in establishing cleanliness.

560-8 Surfaces Not to be Coated.

560-8.1 Galvanized Surfaces: Do not coat galvanized surfaces unless specified in the Contract Documents.

560-8.2 Surfaces to be in contact with Concrete: Do not coat the areas of contact surfaces of steel to be encased or embedded in concrete, or coated with concrete unless specified in the Contract Documents. When specified, prepare the contact surfaces and apply primer.

560-8.3 Faying Surfaces: After application of the primer, protect the contact surfaces of members to be joined by high-strength bolts in friction type joints from all other coatings and foreign material.

560-8.4 Machine Finished Surfaces: Apply a coating of rust preventative compound to all machine finished or similar surfaces that are not to be coated, or will not be coated immediately.

560-8.5 Surfaces to be Welded: Mask off surfaces within 1 inch of field welded connections before the application of any shop coating. Apply a mist coat of primer that is less than 1 mil dry film thickness to surfaces where shear studs will be welded.

560-9 Application.

560-9.1 General: Apply a complete coating system to all structural steel surfaces except surfaces indicated in 560-8. Apply a complete coating system to all surfaces that will become inaccessible after fabrication, erection, or installation.

Apply the prime coat in the shop. Apply the intermediate coat in the shop or field. Only apply the finish coat after erection and after concrete work is complete.

Prior to the application of any coating, inspect the substrate for contamination and defects, and prepare the surface in accordance with 560-7 before application of the next coat.

Apply each coat including a stripe coat in a color that contrasts with the substrate or preceding coat. For exterior surfaces, apply a finish coat color meeting Federal Standard, 595B, Shade 36622, unless otherwise specified in the Contract Documents.

560-9.2 Weather and Temperature Limitations: Do not spray coating when the measured wind speed in the immediate coating area is above 15 miles per hour. Do not apply coatings when contamination from rainfall is imminent or when the ambient air temperature, relative humidity, dew point temperature, or temperature of the steel is outside limits of the coating manufacturer's product data sheet.

560-9.3 Sealing Using Caulk: Completely seal the perimeter of all faying surfaces, cracks and crevices, joints open less than 1/2 inch, and skip-welded joints using caulk. Apply the caulk to the joint following the caulk manufacturer's recommendations. Ensure the caulk bead has a smooth and uniform finish and is cured according to the caulk manufacturer's recommendation prior to the application of the coating system.

560-9.4 Protection of Adjacent Surfaces: Protect all surfaces and working mechanisms not intended to be coated during the application of coatings. Clean surfaces that have been contaminated with coatings until all traces of the coating have been removed. Do not allow material from cleaning and coating operations to be dispersed outside the work site.

560-9.5 Mixing and Thinning: Mix all coatings in accordance with the manufacturer's product data sheet. Only mix complete kits. Use thinners and solvents in accordance with the requirements of the coating manufacturer's product data sheet and confirm that the amount of thinner added does not result in the coating exceeding VOC regulations stated in Section 975.

Perform all mixing operations over an impervious surface with provisions to prevent runoff to grade of any spilled material.

560-9.6 Application Methods: Use coating application equipment and apply coatings per the coating manufacturer's product data sheet. Application with brushes may be permitted for minor touchup of spray applications, stripe coats, or when otherwise approved by the Engineer. Adjust spray equipment to produce an even, wet coat with minimum overspray. Apply coatings in even, parallel passes, overlapping 50 percent. Agitate coatings during application as required by the coating manufacturer's product data sheet.

560-9.7 Stripe Coating: Apply stripe coats to achieve complete coverage and proper thickness on welds, corners, crevices, sharp edges, bolts, nuts, rivets, and rough or pitted surfaces.

560-9.8 Thickness of Coats: Apply coatings to the thickness as identified in the manufacturer's product data sheet. After application of each coat, thoroughly inspect the surfaces and measure the dry film thickness (DFT) in accordance with SSPC-PA 2. When the DFT is deficient or excessive, correct in accordance with the coating manufacturer's recommendations and retest the area.

560-9.9 Coating Drying, and Curing: Apply coatings within the time specified by the coating manufacturer's product data sheet for drying and recoating. Test the coating for proper cure before handling and shipping. Test for cure in accordance with the manufacturer's recommended method. Meet the requirements of ASTM D 4752 for inorganic zinc primers or ASTM D5402 for organic zinc primers when the manufacturer's technical data sheet does not state a specified cure test. Obtain the acceptance criteria from the coating manufacturer and report the results to the Engineer.

Prior to assembling bolted connections, test and verify that the primer coating on the faying surfaces has cured to a resistance rating of 5 in accordance with ASTM D 4752, ASTM D 5402, or the coating manufacturer's requirements. If cure testing is performed per the coating manufacturer's requirements, submit the test results to the Engineer for approval prior to assembling the bolted connection.

560-9.10 Coating Finish: Apply each coat free of runs, sags, blisters, bubbles, and mud cracking; variations in color, gloss, or texture; holidays; excessive film buildup; foreign contaminants; orange peeling; and overspray.

560-10 Touchup and Repair.

Clean and coat all welds, rivets, bolts, and all damaged or defective coating and rusted areas in accordance with 560-7 and 560-9. Upon approval by the Engineer, aluminum mastic may be used in accordance with the manufacturer's recommendations. Aluminum mastic must contain aluminum pigment and minimum 80% volume solids.

560-11 Coal Tar-Epoxy Coating of Permanent Bulkhead Sheet Piles and H Piles.

560-11.1 Surface Preparation: Prepare the substrate in accordance with 560-7. Provide a depth of anchor profile in accordance with the manufacturer's product data sheet, but in no case less than 2.5 mils. Re-blast piles not coated during the same shift or if the surface to be coated no longer meets the requirements SSPC-SP 10.

560-11.2 Application of Coating: Unless otherwise shown in the Contract Documents, apply the inorganic zinc and coal tar-epoxy coatings to all sides of H piles and the exposed side of sheet and pipe piles from the top of the piles to a depth of five feet below the lower of the design ground surface or the design scour depth. Apply the inorganic zinc in accordance with this Section. Apply the coal tar-epoxy in accordance with the following specific requirements:

(1) Apply the coal tar-epoxy system in two coats. The time interval between the first coat and the second coat will be in strict accordance with the coating manufacturer's published specifications. Apply the first coat to yield a dry film thickness of 8 to 10 mils. Apply the second coat to attain a total dry film thickness of the two coats between 16 and 20 mils. For sheet piles, give the inside portion of the interlock claw and the interlock ball a single coat that will yield a dry film thickness of 2 to 4 mils. Build up and puddling of the coating in these areas is not permitted.

(2) Ensure that no portion of the coating is less than the specified minimum film thicknesses. The total minimum film thickness for any combination of coats will be the sum total of the averages of the specified thickness range of the individual coats.

(3) After applying the coating on the steel piles, the Engineer will thoroughly inspect the surfaces and make film thickness measurements at the approximate rate of one for each 25 ft² of area unless deficient thickness is found. In this case, the rate of sub-measurements will be increased as required to determine the extent of the deficient area.

560-12 Basis of Payment.

No separate payment will be made for coating new structural steel. Include the cost in the cost of the structural steel.

563 ANTI-GRAFFITI COATING SYSTEM – DESCRIPTION.

(REV 4-27-09) (FA 5-27-09) (1-10)

ARTICLE 563-1 (Page 715) is deleted and the following substituted:

563-1 Description.

Apply an anti-graffiti coating system to the areas shown in the plans. Perform the painting in accordance with this Section, using materials meeting the requirements of Section 975 and listed on the Department's Qualified Products List (QPL). Use anti-graffiti coating systems that are recommended for the substrate by the anti-graffiti coating system manufacturer. On concrete substrates, use sacrificial or non sacrificial anti-graffiti coatings. On steel substrates, use non sacrificial anti-graffiti coatings only.

570 PERFORMANCE TURF.
(REV 10-14-09) (FA 12-28-09) (7-10)

SECTION 570 (Pages 717 - 722) is deleted and the following substituted:

SECTION 570
PERFORMANCE TURF

570-1 Description.

Establish a growing, healthy turf over all areas designated on the plans. Use sod in areas designated on the plans to be sodded. Use seed, hydroseed, bonded fiber matrix, or sod in all other areas. Maintain turf areas until final acceptance of all contract work in accordance with Section 5-11.

570-2 Materials.

Meet the following requirements:

Turf Materials	Section 981
Fertilizer	Section 982
Water	Section 983

570-3 Construction Methods.

570-3.1 General: Incorporate turf installation into the project at the earliest practical time.

Shape the areas to be planted to the plan typical sections and lines and grade shown in the Contract Documents.

Except in areas where the Contract Documents requires specific types of grass to match adjoining private property, any species of grass designated in Section 981 may be used. Use the methods and materials necessary to establish and maintain the initial grassing until acceptance of the Contract work in accordance with 5-11. All of the permanent grassing material shall be in place prior to final acceptance.

The Department will only pay for replanting as necessary due to factors determined by the Engineer to be beyond control of the Contractor.

Complete all grassing on shoulder areas prior to the placement of the friction course on adjacent pavement.

570-3.2 Seeding: At the Contractor's option, wildflower seed may be included in the turf seeding operation or performed separately from the turf seeding.

Use of compost meeting the requirements of Section 987 as mulch is acceptable unless otherwise specified.

570-3.3 Sod: Place the sod on the prepared surface, with edges in close contact. Do not use sod which has been cut for more than 48 hours.

Place the sod to the edge of all landscape areas as shown in the plans and as shown in the Design Standards.

Peg sod at locations where the sod may slide. Drive pegs through sod blocks into firm earth, flush with the sod soil surface, at intervals approved by the Engineer. The work and materials for pegging of sod as directed by the Engineer will be paid for as Unforeseeable Work.

Place rolled sod parallel with the roadway and cut any exposed netting even with the sod edge.

Monitor placed sod for growth of pest plants and noxious weeds. If pest plants and/or noxious weeds manifest themselves within 30 days of placement of the sod during the months April through October, within 60 days of placement of the sod during the months of November through March treat affected areas by means acceptable to the Department at no expense to the Department. If pest plants and/or noxious weeds manifest themselves after the time frames described above from date of placement of sod, the Engineer, at his sole option, will determine if treatment is required and whether or not the Contractor will be compensated for such treatment. If compensation is provided, payment will be made as Unforeseeable Work as described in 4-4.

Remove and replace any sod as directed by the Engineer.

570-3.4 Hydroseeding: Use equipment specifically designed for mixing the mulch, seed, fertilizer, tackifier and dye, and applying the slurry uniformly over the areas to be hydroseeded.

Use mulch that does not contain reprocessed wood or paper fibers. Ensure that 50% of the fibers will be retained on a twenty-five mesh screen.

Mix fertilizer as required into the hydroseeding slurry.

Ensure that the dye does not contain growth or germination inhibiting chemicals.

When polyacrylamide is used as part of hydroseeding mix, only anionic polymer formulation with free acrylamide monomer residual content of less than 0.05% is allowed. Cationic polyacrylamide shall not be used in any concentration. Do not spray polyacrylamide containing mixtures onto pavement. These may include tackifiers, flocculants or moisture-holding compounds.

570-3.5 Bonded Fiber Matrix (BFM): Meet the minimum physical and performance criteria of this Specification for use of BFM in hydroseeding operations or temporary non-vegetative erosion and sediment control methods.

Provide evidence of product performance testing, manufacturer's certification of training and material samples to the Engineer at least seven calendar days prior to installation.

Provide documentation to the Engineer of manufacturer's testing at an independent laboratory, demonstrating superior performance of BFM as measured by reduced water runoff, reduced soil loss and faster seed germination in comparison to erosion control blankets.

Use only BFMs that contain all components pre-packaged by the manufacturer to assure material performance. Deliver materials in UV and weather resistant factory labeled packaging. Store and handle products in strict compliance with the manufacturer's directions.

When polyacrylamide is used as part of hydroseeding mix, only anionic polymer formulation with free acrylamide monomer residual content of less than 0.05% is allowed. Cationic polyacrylamide shall not be used in any concentration. Do not spray polyacrylamide containing mixtures onto pavement. These may include tackifiers, flocculants or moisture-holding compounds.

Meet the following requirements after application of the formed matrix:

Ensure that the tackifier does not dissolve or disperse upon re-wetting.

Ensure that the matrix has no gaps between the product and the soil and that it provides 100% coverage of all disturbed soil areas after application.

Ensure that the matrix has no germination or growth inhibiting properties and does not form a water-repelling crust.

Ensure that the matrix is comprised of materials which are 100% biodegradable and 100% beneficial to plant growth.

Mix and apply the BFM in strict compliance with the manufacturer's recommendations.

Apply the BFM to geotechnically stable slopes at the manufacturer's recommended rates.

Degradation of BFM will occur naturally as a result of chemical and biological hydrolysis, UV exposure and temperature fluctuations. Re-application, as determined by the Engineer, will be required if BFM-treated soils are disturbed or water quality or turbidity tests show the need for an additional application. The work and materials for re-application, will be paid for as Unforeseeable Work.

570-3.6 Watering: Water all turf areas as necessary to produce a healthy and vigorous stand of turf. Ensure that the water used for turf irrigation meets the requirements of Section 983.

570-3.7 Fertilizing: Fertilize as necessary based on soil testing performed in accordance with Section 162. Refer to Section 982 for fertilizer rates.

For bid purposes, base estimated quantities on an initial application of 265 lbs/acre and one subsequent application of 135 lbs/acre of 16-0-8.

570-4 Turf Establishment.

Perform all work necessary, including watering and fertilizing, to sustain an established turf until final acceptance, at no additional expense to the Department. Provide the filling, leveling, and repairing of any washed or eroded areas, as may be necessary.

Established turf is defined as follows:

Established root system (leaf blades break before seedlings or sod can be pulled from the soil by hand).

No bare spots larger than one square foot.

No continuous streaks running perpendicular to the face of the slope.

No bare areas comprising more than 1% of any given 1,000 square foot area.

No deformation of the turf areas caused by mowing or other Contractor equipment.

Monitor turf areas and remove all competing vegetation, pest plants, and noxious weeds (as listed by the Florida Exotic Pest Plant Council, Category I "List of Invasive Species", Current Edition, www.fleppc.org). Remove such vegetation regularly by manual, mechanical, or chemical control means, as necessary. When selecting herbicides, pay particular attention to ensure use of chemicals that will not harm desired turf or wildflower species. Use herbicides in accordance with 7-1.7.

If at the time that all other work on the project is completed, but all turf areas have not met the requirements for established turf set forth in 570-4, continuously maintain all turf areas until the requirements for established turf set forth in 570-4 have been met.

During the entire establishment period and until turf is established in accordance with this specification, continue inspection and maintenance of erosion and sedimentation control items in accordance with Section 104. Take responsibility for the proper removal and disposal of all erosion and sedimentation control items after turf has been established.

Notify the Engineer, with a minimum of seven calendar days advance notice, to conduct inspections of the turf at approximate 90-day intervals during the establishment period to determine establishment. Results of such inspections will be made available to the Contractor

within seven calendar days of the date of inspection. Determination of an established turf will be based on the entire project and not in sections.

Upon the determination by the Engineer that the requirements of 570-4 have been met and an established turf has been achieved and all erosion and sedimentation control items have been removed, the Engineer will release the Contractor from any further responsibility provided for in this Specification.

The Contractor's establishment obligations of this specification will not apply to deficiencies due to the following factors, if found by the Engineer to be beyond the control of the Contractor, his Subcontractors, Vendors or Suppliers:

a. Determination that the deficiency was due to the failure of other features of the Contract.

b. Determination that the deficiency was the responsibility of a third party performing work not included in the Contract or its actions.

The Department will only pay for replanting as necessary due to factors determined by the Department to be beyond the control of the Contractor.

570-5 Responsible Party.

For the purposes of this Specification, the Contractor shall be the responsible party throughout construction and establishment periods.

Upon final acceptance of the Contract in accordance with 5-11, the Contractor's responsibility for maintenance of all the work or facilities within the project limits of the Contract will terminate in accordance with 5-11; with the sole exception that the facilities damaged due to lack of established turf and the obligations set forth in this Specification-for Performance Turf shall continue thereafter to be responsibility of the Contractor as otherwise provided in this Section.

570-6 Disputes Resolution.

The Contractor and the Department acknowledge that use of the Statewide Disputes Review Board is required and the determinations of the Statewide Disputes Review Board for disputes arising out of the Performance Turf Specification will be binding on both the Contractor and the Department, with no right of appeal by either party, for the purposes of this Specification.

Any and all Statewide Disputes Review Board meetings after final acceptance of the Contract in accordance with 5-11 shall be requested and paid for by the Contractor. The Department will reimburse the Contractor for all fees associated with meetings.

570-7 Failure to Perform.

Should the Contractor fail to timely submit any dispute to the Statewide Disputes Review Board, refuse to submit any dispute to the Statewide Disputes Review Board, fail to provide an established turf in accordance with 570-4 within one-year of final acceptance of the Contract in accordance with 5-11, or fail to compensate the Department for any remedial work performed by the Department in establishing a turf and other remedial work associated with lack of an established turf, including but not limited to, repair of shoulder or other areas due to erosion and removal of sediments deposited in roadside ditches and streams, as determined by the Statewide Disputes Review Board to be the Contractor's responsibility, the Department shall suspend, revoke or deny the Contractor's certificate of qualification under the terms of Section 337.16(d)(2), Florida Statutes, until the Contractor provides an established turf or makes full and

complete payment for the remedial work performed by the Department. In no case shall the period of suspension, revocation, or denial of the Contractor's certificate of qualification be less than six (6) months. Should the Contractor choose to challenge the Department's notification of intent for suspension, revocation or denial of qualification and the Department's action is upheld, the Contractor shall have its qualification suspended for a minimum of six (6) months or until the remedial action is satisfactorily performed, whichever is longer.

570-8 Method of Measurement.

The quantities to be paid for will be plan quantity in square yards based on the area shown in the plans, completed and accepted.

570-9 Basis of Payment.

Prices and payments will be full compensation for all work and materials specified in this Section.

Payment will be made under:

Item No. 570- 1- Performance Turf - per square yard.

603 GENERAL REQUIREMENTS FOR THE INSTALLATION AND EVALUATION OF TRAFFIC CONTROL SIGNALS AND DEVICES.

(REV 1-20-10) (FA 1-28-10) (7-10)

SECTION 603 (Pages 727 – 730) is deleted and the following substituted:

**SECTION 603
GENERAL REQUIREMENTS FOR THE INSTALLATION
AND EVALUATION OF TRAFFIC CONTROL SIGNALS AND
DEVICES**

603-1 Description.

The provisions contained in this Section include general requirements for all traffic control signals and devices.

603-2 Equipment and Materials.

603-2.1 General: Except as provided in 603-2.2, only use traffic control signals and devices meeting the requirements of the Minimum Specifications for Traffic Control Signals and Devices (MSTCSD), the Contract Documents, and listed on the Department's Approved Product List (APL).

Only use new equipment and materials, except as specified in the Contract Documents.

603-2.2 Exceptions: The Department may grant exceptions to the requirements of 603-2.1 by Temporary Permit or Conditional Approval for Limited Use to evaluate new technology or for other circumstances that are found to be in the public interest.

603-2.3 Uniformity: Only use compatible units of any one item of equipment, such as signal heads, detectors, controllers, cabinets, poles, signal system or interconnection equipment, etc.

603-2.4 Hardware and Fittings: Ensure that all bolts and nuts less than 5/8 inch in diameter are passivated stainless steel, Type 316 or Type 304 and meet the requirements of ASTM F 593 and ASTM F 594 for corrosion resistance.

Ensure that all bolts and nuts 5/8 inch and over in diameter are galvanized and meet the requirements of ASTM A 307.

Use high-strength steel anchor bolts and U-bolts, having a minimum yield strength of 55,000 psi and a minimum ultimate strength of 90,000 psi.

603-2.5 Galvanizing: Meet the requirements of Section 962 when galvanizing for fittings and appurtenances for all structural steel (including steel poles).

603-3 Definitions.

Traffic Control Signals and Devices: Any signal or device; manually, electrically or mechanically operated, by which traffic is alternately directed to stop and permitted to proceed or controlled in any manner. Traffic Control Signals and Devices regulate, warn, or guide traffic on, over, or adjacent to a street, highway, pedestrian facility, or bikeway by authority of a public agency having jurisdiction. Traffic Control Signals and Devices include, but are not limited to, controller assemblies (controller cabinets and their contents); signal heads including their hanging or mounting devices; vehicle detection systems (loops, sealant, amplifier, lead-in wire, or cable); pedestrian detection systems (push button, push button housing, lead-in wires, and signal); Motorist Information Systems, Video Equipment, Network Devices, Dynamic Message Signs, Highway Advisory Radios, Road Weather Information Systems, Cameras, Vehicle Detection Systems, and other equipment used within a traffic control system.

Minimum Specifications for Traffic Control Signals and Devices: The current edition of the MSTCSD, maintained by the State Traffic Engineering and Operations Office, which provides standards and specific technical requirements for electronic equipment and materials for the evaluation of traffic control signals and devices.

Approved Product List (APL): A listing of certified or approved traffic control signals and devices and hardware, compiled and maintained by the State Traffic Engineering and Operations Office.

Temporary Permit: A permit issued by the State Traffic Engineering and Operations Office. A Temporary Permit is issued to a public or private entity for the temporary installation of a device for the purpose of evaluating the device's operational effectiveness and safety. Under a Temporary Permit, the device shall be provided at no cost to the Department for the duration of the evaluation. The State Traffic Engineering and Operations Office maintains the list of temporarily permitted traffic control signals and devices.

Conditional Approval for Limited Use: A limited approval issued by the State Traffic Engineering and Operations Office for a specified time period at a specific location(s) for products requiring approval by the Department and that are determined to be in the best interest of the public. All conditions of the approval must be met for the device to be allowed to remain installed and in use. This approval is issued to a public or private entity for the purpose of evaluating the device's operational effectiveness and safety. The State Traffic Engineering and Operations Office maintains the list of conditionally approved traffic control signals and devices.

603-4 Systems Approval Requirement.

The Engineer will review and approve any system design plan of traffic control signals and devices, that is controlled and/or operated from a remote location by computers or similar devices, and which affects the movement of traffic on any portion of the State Highway System,

prior to installation. Within such system, only use traffic control signals and devices that meet all certification or approval requirements contained herein.

603-5 Device Approval Process.

The traffic control signals and devices approval process is described in detail in Section A601 of the MSTCSD.

603-6 Marking of Approved Equipment.

Ensure that traffic control signals and devices are marked in accordance with Section A601-6 of the MSTCSD.

603-7 Submittal Data Requirements.

Prior to the installation of equipment and within 30 days after the preconstruction conference, submit a completed listing of all traffic control signals, devices, or hardware with APL certification number(s) to the Engineer for approval on form 750-010-02, Submittal Data – Traffic Control Equipment, provided by the Department. On all non-structural equipment or materials that do not have a Florida Department of Transportation Certification Number, submit one copy of the manufacturer's descriptive literature and technical data fully describing the types of equipment that will be used to the Engineer.

Develop shop drawings for all structural support materials and other special designs, such as non-electrical, non-mechanical, or other fabricated items, which may not be specifically detailed in the plans. Have the Specialty Engineer approve all shop drawings. Do not submit shop drawings for those items that have been previously evaluated and approved. Meet the requirements of 5-1.4 for shop drawings. Send two copies of the shop drawings signed and sealed by the Specialty Engineer to the Engineer.

The Engineer will approve submittal data for devices having a Florida Department of Transportation APL Certification Number.

The Department is not liable for any equipment or material purchased, work done, or delay incurred prior to such approval.

Provide a complete operable signal installation as specified in the Contract regardless of any failure of the Department to discover or note any unsatisfactory material. Meet the requirements of Section 608.

603-8 Documentation for Electronic Equipment.

Prior to final acceptance, furnish the Engineer with two copies of the following documentary items obtained from the manufacturer for the electronic equipment listed below:

1. Operation Manual
2. Troubleshooting and Service Manual
3. Assembly and Installation Instructions
4. Pictorial layout of components and schematics for circuit boards
5. Parts list, including the location
6. Diagram of the field installation wiring (not applicable to the detectors)
7. Warranty information

Furnish documentary items for the following equipment:

1. Controllers
2. Vehicle detectors
3. Load switches

4. Flasher units
5. Preemption units
6. Conflict monitors
7. Special sequence relays
8. Cameras
9. Dynamic Message Signs
10. Highway Advisory Radios
11. Road Weather Information Systems
12. Any other equipment which has a logic, timing, or communications function
13. Other equipment specified in the Contract Documents

603-9 Department-Furnished Equipment Installed By Contractor.

Where the Contract includes installation of Department-furnished equipment, the Department will turn over such equipment to the Contractor when the construction progress allows or as designated in the Contract Documents. The Department will test and certify the equipment to be in proper condition and ready to use and will bear the costs of correcting any defects in the equipment prior to pick-up by the Contractor. The Engineer will coordinate the pick-up and installation of the equipment. Maintain the equipment in proper operational condition after pick-up at no cost to the Department, until either final acceptance or the equipment is returned to the Department.

**608 GUARANTIES FOR TRAFFIC CONTROL SIGNALS AND DEVICES.
(REV 1-20-10) (FA 1-28-10) (7-10)**

SECTION 608 (Page 730) is deleted and the following substituted:

**SECTION 608
GUARANTIES FOR TRAFFIC CONTROL SIGNALS AND DEVICES**

608-1 Description.

This Section sets forth guaranty requirements for traffic control signals and devices furnished to the Department. The Department will consider manufacturer and Contractor costs associated with providing and delivering equipment guaranties, requirements, terms, and conditions incidental to the payment for equipment or construction feature utilizing the equipment.

608-2 Guaranty Provisions.

608-2.1 Contractor's Responsibility: Secure all guaranties that are customarily issued by the equipment manufacturer for the specific equipment included in the Contract. Ensure that all manufacturers' warranties are fully transferable to the Department and meet or exceed the Department's minimum warranty requirements for the equipment. The Contractor shall ensure that the form in which such guaranties are delivered to the Contractor includes the provision that they are subject to transfer to the maintaining agency as named by the Department, and is accompanied by proper validation of such fact. Transfer guaranties at final acceptance of the work (or equipment) by the Department.

608-2.2 Terms: Ensure that the terms of guaranties are stipulated by the manufacturer when submitting a request to the Department for certification and equipment submittals 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.

608-2.3 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 maintaining agency and to the manufacturer. If the Contractor does not comply with the terms of the guaranty, the Department may suspend the certification. Comply with additional terms and conditions as stated in purchasing agreements.

611 ACCEPTANCE PROCEDURES FOR TRAFFIC CONTROL SIGNALS AND DEVICES.

(REV 6-22-10) (FA 7-26-10) (1-11)

SECTION 611 (Pages 731 – 736) is deleted and the following substituted:

SECTION 611 ACCEPTANCE PROCEDURES FOR TRAFFIC CONTROL SIGNALS AND DEVICES

611-1 Description.

This Section sets forth Contract acceptance procedures for installations of traffic control signals and devices and for equipment purchase contracts.

611-2 Acceptance of Traffic Control Signal and Device Installations.

611-2.1 Partial Acceptance: The Engineer may make inspection for partial acceptance under the Contract in accordance with 5-10 of a complete traffic control signal and device installation upon its completion in accordance with the Contract Documents and at such time that other parts of the total Contract are at a stage of completion that either require or allow the installation to operate in a manner which is in accordance with the Contract Documents. Before inspection for partial acceptance, the Engineer will require the satisfactory completion of all field tests of completed installations in accordance with the requirements of 611-4. The Engineer will make inspection for partial acceptance in accordance with 5-10 in company with a Contractor's representative and, when applicable, a representative of the agency designated to accept maintenance responsibility.

611-2.2 Final Acceptance: The Engineer will make inspection for final acceptance of traffic control signal and device installations as part of all work under the Contract in accordance with 5-11, only after satisfactory completion of all field tests of completed installations in accordance with the requirements of 611-4 and on the basis of a comprehensive final field inspection of all equipment installations. Submit three copies of Form 750-010-02, Submittal Data – Traffic Control Equipment, to the Engineer. The Engineer will make the final inspection with a Contractor's representative and, when applicable, a representative of the agency designated to accept maintenance responsibility. Transfer warranties and guarantees on

equipment to the Department in accordance with Section 608. For traffic signal installations, submit three completed copies of form 700-010-22, Final Acceptance of Traffic Signal Installation(s) and Transfer of Maintenance, to the Engineer.

611-2.3 As-Built Drawings: As a condition precedent to acceptance under 611-2.1 or 611-2.2, furnish as-built drawings of all installations in accordance with the following requirements:

611-2.3.1 Submittal Requirements: Submit three sets of as-built plans for review by the Engineer on reproductions of the original 11 by 17 inch sheets. Record all as-built information using block lettering or typed text to ensure legibility. Signing and pavement marking plan sheets may be used instead of signalization plan sheets, if a substantial number of changes from the original plans must be recorded. ITS as-built plans must include an accurate table (spreadsheet) that provides the true final location of devices by mile post to three decimal places, plus an offset dimension given for each above-ground structure. Global positioning system (GPS) coordinates can be utilized as supplemental information in the table. Aerial photographs may be furnished with the table to provide supplementary information. The aerials should not include the extra features of the ROW, baseline, or roadway edges being drawn in. The aerials may be used as a base for the as-built plans with mile post and offset dimensions. If, in the opinion of the Engineer, the changes can not be clearly delineated on reproductions of the original 11 by 17 inch sheets, clearly delineate all changes on 11 by 17 inch detail sheets, enlarged 200% from the reproductions. Make any corrections resulting from the Engineer's review, and resubmit three sets of the completed as-built plans as a condition precedent to acceptance of the installation.

611-2.3.2 Components: Include as-built information for all components of the installation. As a minimum, identify the following components in the format indicated below.

611-2.3.2.1 Conduit and Cable: Identify all conduit and cable with unique linestyles for routing (overhead, conduit, saw cut, etc.) that are clearly identified in a legend on each sheet. Identify the type of cable (i.e., 7 conductor signal cable) and label the number of conductors, fiber strands or other identifying features of the cable. For conduit, clearly note conduit size and number of runs.

611-2.3.2.2 Loops and Detection Zones: Identify the location of all installed loops (including the distance from the stop bar for the advance loops), the path of each loop to the pull box, the loop window and the path of the loop lead-in to the controller cabinet. Identify the device location and the approximate detection area for detection systems that are not embedded in or under pavement.

611-2.3.2.3 Pull Boxes: Label unused and out of service pull boxes clearly. Show distances to each pull box from the nearest edgeline, stop bar, or other permanent feature. If an edgeline is not near a pull box or would not clearly identify its location, a fixed monument may be used (i.e. FDOT pole or structure).

611-2.3.2.4 Poles: Locate Poles from the nearest edgeline of both approaches. If an edgeline is not near a pole or would not clearly identify its location, a fixed monument may be used.

611-2.3.2.5 Signal Heads: Locate all signal heads with respect to the pavement markings. Each signal head shall be identified by its corresponding movement number.

611-2.3.2.6 Cabinet: Clearly locate all cabinets. The type of cabinets and inventory of internal components must be documented. Controller manufacturer along with the controller model number shall be provided for all traffic signal cabinets. A cabinet corner "blow

up” shall be provided detailing pull box locations with all conduit and cable per 611-2.3.2.1 and 611-2.3.2.3.

611-2.3.2.7 Preemption: Clearly locate all preemption equipment. The type of preemption equipment and the manufacturer along with the model number shall be provided. Additionally, the type of communication medium (i.e. closed loop) shall be identified. Any underground conduit and cable as well as pull boxes shall be per 611-2.3.2.1 and 611-2.3.2.3.

611-2.3.3 Compensation: All costs involved with providing as-built drawings are incidental to the other items of work associated with traffic control signals and devices.

611-2.4 Installation Inspection Requirements: Meet the requirements of Section 105.

611-3 Signal Timing.

Set the timing of a traffic signal or system of traffic control devices in accordance with the Contract Documents, unless approved otherwise in writing by the Engineer.

611-4 Field Tests of Installations.

Perform the following tests in the presence of the Engineer and, when applicable, a representative of the agency designated to accept maintenance responsibility.

Continuity: Test each signal head circuit, pedestrian detector circuit, vehicle detector loop circuit, and interconnect signal circuit for continuity.

Functional: Perform a functional test that demonstrates that each and every part of the installation functions as specified.

Induced Voltage on traffic signal connections: Measure the voltage between each signal head indication field terminal and the AC neutral circuit in the controller cabinet during the off (dark) state of each signal head indication. Ensure that the voltage does not exceed $2 V_{AC, RMS}$. If this value is exceeded, take the following action to reduce the value to $2 V_{AC, RMS}$:

(1) Check for loose or broken connections in the signal head circuit from the controller cabinet to the signal heads.

(2) If (1) above does not correct the problem, connect additional neutral circuits between the signal head and the controller cabinet.

Inductive Loop Assembly: An inductive loop assembly is defined as a loop plus the lead-in cable. Measure and record the series resistance of each inductive loop assembly. Ensure that the resistance does not exceed 10Ω . Perform an insulation resistance megger test, at $500 V_{DC}$, for each inductive loop assembly at the cabinet in which the inductive loop assembly is terminated. Do not connect the inductive loop assembly to the cabinet terminal strips during the test, except for the drain wire of a shielded lead-in cable. Insulation resistance is defined as the resistance between one wire of the lead-in cable and a ground rod or bussbar. Record the insulation resistance of each inductive loop assembly. Ensure that the resistance is equal to or greater than $100 M\Omega$.

Perform the 48 hour test only after achieving acceptable results from the other tests listed in 611-4.

Forty-Eight Hour Test for Traffic Signal installations:

(a) Before beginning the 48 hour test, place all new signal installations (no existing signals) in flash for 48 to 336 hours. The length of the flash period will be determined by the Engineer.

(b) Continuously operate each new or modified traffic signal installation or system for not less than 48 hours. If unsatisfactory performance of the system develops, correct the condition, and repeat the test until obtaining 48 hours of satisfactory continuous operation.

(c) During the 48 hour test period, the Contractor is fully responsible for the signal or signal systems. Provide a responsible representative (technically qualified) who can monitor signal operation and troubleshoot any malfunctions within a one hour period.

When coordination is specified in the Contract Documents, provide a two hour training session on the operation and programming of the coordination features of the controller units during the 48 hour test. Arrange the time and place of the training session with the Engineer.

(d) Perform a 48 hour test for flashing beacon installations in the same manner as for traffic signal installations.

(e) Start the 48 hour test on a Monday, Tuesday, or Wednesday. However, do not start the 48 hour test on the day preceding a holiday.

(f) Start the 48 hour test between 9:00 AM and 2:00 PM.

(g) Before the 48 hour test, install and have standing by all equipment specified in the Contract Documents.

611-5 Contractor's Warranty Period for Installations.

611-5.1 General Requirements: After satisfactory completion of all field tests in accordance with 611-4, repair or replace any defective components or work of the installations for a 90 day period after final acceptance in accordance with 5-11.

611-5.2 Contractor's Responsibilities: During the warranty period, the Contractor is responsible for the following:

(a) Repair or replacement of equipment that fails to function properly due to defective materials or workmanship.

(b) Upon notification by the Engineer of a malfunction, restore the equipment to proper operating condition within 12 hours after notification by the Engineer.

If the Contractor fails to restore the equipment to proper operating condition within 12 hours after notification, the Engineer has the authority to have the remedial work performed by other forces. The Contractor is responsible for all incurred costs of the work performed by other forces. Remedial work performed by other forces does not alter any of the requirements, responsibilities or obligations of this warranty.

(c) In the event that the equipment does not function or malfunctions due to defective materials or workmanship, the Contractor is liable for any impairment to the safety of pedestrian and vehicular traffic resulting from such malfunction.

611-5.3 Department's Responsibilities: During the warranty period, the Department is responsible for the following:

(a) Electrical energy costs which are paid for by the local maintaining agency.

(b) All adjustments, such as timing, necessary for the normal operations of equipment.

(c) Documentation of the individuals involved and the time of Contractor notification upon failure or malfunction of equipment.

(d) Repair or replacement of any part of the installation damaged as a result of natural causes or those resulting from vehicular or pedestrian traffic not associated with Contractor activities.

611-6 Manufacturer's Tests and Certifications.

For materials which may not require formal testing, the Engineer reserves the right to require certifications from the manufacturer of such equipment and material, to the effect that they meet all Specification requirements, and, in the event of questionable equipment or material, to require that such material or equipment be tested at no expense to the Department.

The Engineer reserves the right to withhold any payments which may be due; if the Engineer determines that the equipment does not meet the Specifications or evaluation criteria.

611-7 Contracts for Purchase of Equipment.

611-7.1 Acceptance Tests Required: For each unit of equipment furnished under purchase contracts (furnish only), the Engineer will perform the following tests:

(a) Visual inspection within five days after delivery.

(b) Operational tests which determine whether the equipment performs in accordance with the requirements of the Contract Documents. The Engineer will complete such tests within 15 days after delivery. If the equipment is listed on the Department's Approved Product List (APL), the Engineer may verify the APL Certification number in lieu of the operational tests.

611-7.2 Eligibility for Payment:

The Department will base payment for equipment furnished under purchase contracts on satisfactory completion of the visual inspection and operational tests required by 611-7.1.

Before any payment will be made for each functional group, deliver to the Engineer and receive from the Engineer acceptance of all units of each functional group of equipment required to be furnished by the Contract Documents. The Department will make separate payment for a staged delivery of each functional group of equipment only when staged delivery is specified in the Contract Documents.

611-7.3 Equipment Failing to Pass Acceptance Tests:

When any unit of equipment fails to pass the acceptance tests, correct the deficiencies (by repair or replacement), at no expense (including all freight costs) to the Department, to attain compliance. If the original Contract Time has expired, the Department will charge and continue to assess liquidated damages in accordance with 8-10 until final acceptance of the equipment. Upon compliance with such correction requirements, the Engineer will perform tests on the equipment as specified above and will determine their eligibility for payment.

The Department will not assess liquidated damages during the acceptance test period in 611-7.1. The Department will allow only one acceptance test exclusion with regard to liquidated damages assessment per lot of units required to be delivered.

635 PULL AND JUNCTION BOXES.
(REV 7-28-10) (FA 8-3-10) (1-11)

ARTICLE 635-3 (Page 749) is deleted and the following substituted:

635-3 Pull Boxes Installation.

Install pull boxes in accordance with the Design Standards, Index No. 17700. Ensure that the pull box cover is flush with the finished grade or sidewalk. Do not install pull boxes in roadways, driveways, parking areas, ditches or public sidewalk curb ramps.

650 VEHICULAR SIGNAL ASSEMBLIES – INSTALLATION.
(REV 6-17-09) (FA 6-18-09) (1-10)

SUBARTICLE 650-3.7 (Page 761) is deleted and the following substituted:

650-3.7 Vertically Mounted Polycarbonate (Light-Weight) Signal Head Assemblies:

The top section of all multi- section (5- section, 3- section), vertically mounted, light- weight signal heads must be constructed of die cast aluminum, unless the entire 3-section polycarbonate signal head assembly is specifically approved and listed on the APL as a 12” Polycarbonate 3-Section Vehicle Assembly. Ensure that all sections of multi- section assemblies are from the same manufacturer.

Single section signals may be constructed of die cast aluminum or polycarbonate construction.

690 REMOVAL OF EXISTING TRAFFIC CONTROL SIGNALS AND DEVICES.
(REV 6-16-10) (FA 7-26-10) (1-11)

SECTION 690 (Pages 772 – 775) is deleted and the following substituted:

SECTION 690
REMOVAL OF EXISTING TRAFFIC CONTROL SIGNALS AND DEVICES

690-1 Description.

Remove existing traffic control signals and devices including electrical and electronic equipment, supporting hardware and structures, electrical wiring, conduit, and all other elements specified and required to clear the areas of concern for new installations.

When removing existing traffic signals and devices , salvage and protect all equipment and materials designated for removal in the Contract Documents.

690-2 Ownership.

The Department retains ownership of the equipment removed unless otherwise stated in the Contract Documents.

690-3 General Removal Operations.

Remove and salvage all equipment, appurtenances, and materials designated on the plans to remain the property of the Department or other owner.

Where the removals require excavation, backfill, compact, and level the excavated areas (unless to be used as areas for other installations) so as to form a smooth contour, uniform in density with adjacent ground areas.

Where the removal operations require the removal or disturbance of overlying pavement, curb, grass, or sidewalk, remove such pavement and subsequently replace it in kind (or equivalent).

Remove, handle, and transport electronic equipment to be removed with all due care. Correct any damage to such equipment caused by negligence at no expense to the Department regardless of whether the damage occurs before or after removal of the equipment.

When removing all electronic equipment, also remove all attaching devices and all other devices and auxiliaries related to the electronic unit which the Department does not require to remain in place for use with replacing equipment.

Perform all removals in such a manner as to not damage or disturb adjacent property, utilities, or other equipment.

When replacing existing functioning installations with new installations, do not remove the existing installations until the new installations are in place and operating or until temporary traffic control approved by the Engineer is in place.

Notify the proper authorities or the owners of affected adjacent installations at least 24 hours in advance of any removal operations which might endanger or otherwise affect the operations of their facilities.

When the Contract Documents indicate that owners (or others) will remove their own poles, carefully remove and handle all equipment from such poles prior to such removal of the poles.

690-4 Specific Removal Operations.

690-4.1 Removal of Poles: Remove direct burial, strain poles, steel strain poles, mast arm and monotube assemblies and associated foundations as specified in the plans. Obtain the Engineer's approval for the removal process before beginning any removal work. These requirements do not apply to poles used for highway lighting, unless they are jointly used to support traffic control signals and devices, signal mast arm, or span wire assemblies.

Accomplish the removal process of each pole/foundation in such a manner as not to result in a safety hazard to motorists or adjacent property or damage to existing utilities. Ensure that all utilities have been located prior to removal.

When shallow pole removal is specified in the plans, ensure the remaining pole/foundation and any protrusions, such as pole keys, dead men, guying apparatus, conduit, anchor bolts, or reinforcing steel, are removed to a minimum depth of 4 feet below existing grade.

When deep pole removal is specified in the plans completely remove each pole including the foundation and all accessories or attachments, such as pole keys, dead men, guying apparatus, conduit, anchor bolts, and reinforcing steel.

Do not remove or disturb utility poles located within the right-of-way.

690-4.2 Removal of Signal Pedestal: Remove each signal pedestal and associated foundations as specified in the plans. Obtain the Engineer's approval for the removal process before beginning any removal work.

Accomplish the removal process of each pedestal/foundation in such a manner as not to result in a safety hazard to motorists, pedestrians or adjacent property or damage to existing utilities. Ensure that all utilities have been located prior to removal.

Completely remove each pedestal including the foundation and all accessories or attachments, such as pole keys, conduit, anchor bolts, and reinforcing steel.

690-4.3 Removal of Controllers and Cabinets: When removing controller assemblies, also remove the cabinet. For base mounted cabinets, completely remove the concrete base and technician pad.

Prior to removal, conduct an inventory of the cabinet and all cabinet contents, including identification of the model number and serial numbers of each item. Submit the inventory list to the Engineer for retention by the Department and provide a copy of the list to the equipment owner.

690-4.4 Removal of Signal Heads (Vehicular and Pedestrian): Remove all signal head assemblies and attachment hardware in such a manner as to avoid unnecessary damage.

690-4.5 Removal of Detectors (Vehicular and Pedestrian): Divide the removal of detector assemblies into the following categories:

(a) Vehicular Detector Assemblies: When the removal of vehicular detector assemblies is specified in the Contract Documents, remove the amplifier from the controller cabinet, the loop, and the lead-in wiring that is in the conduit and pull boxes.

When removing pressure type vehicular detector assemblies, remove the amplifier and the detector pad and its framework from the roadway pavement. After removing such detector assemblies, repair the roadway areas by backfilling and tamping with an approved asphalt concrete mix or concrete pavement mix so as to restore the roadway to the satisfaction of the Engineer.

When removing non-intrusive detectors that are not embedded in or under pavement, remove the roadside detector assembly, cabling, mounting hardware, and detector electronics in cabinet.

(b) Pedestrian Detector Assemblies: Include in the removal of pedestrian detector assemblies the removal of the push button detector, sign, and all mounting hardware, including the supporting post and foundation.

690-4.6 Removal of Mast Arms and Span Wires: Disconnect the mast arms and span wires carefully at the pole, and salvage all usable hardware and attachment devices as determined by the Engineer. Remove all devices supported by the mast arm or span wire (including wiring) prior to the removal of the mast arm or span wire.

For integrally installed mast arms and mast arm poles, remove the pole and mast arm combination as a unit after removing the devices supported by the mast arms.

690-4.7 Removal of Cabling and Conduit: After removing the conductor cable and conduit, carefully stub, or protect with other appropriate procedures, the remaining conductor cable and conduit at the point of removal.

If the removal of any cables and conduit requires excavation, restore disturbed areas compatible with adjacent ground areas.

690-5 Transporting and Storing Removed Equipment.

When the Contract Documents specify special handling, deliver equipment and materials that are not stipulated to be reused in the new installations to the location(s) designated in the Contract. When the Contract Documents note no special handling, stockpile or dispose of the removed materials as approved by the Engineer. The Engineer will determine ownership of

removed equipment and will approve of the removal of any salvaged equipment from the project in advance.

Provide disposal areas, and dispose of removed concrete strain poles in such areas.

690-6 Method of Measurement.

690-6.1 General: The quantities to be paid for will be measured in accordance with the different work tasks required in this Section. The Contract unit price for each different work task as specified in the Contract Documents will include all labor and equipment required to remove the specified items specified by the Pay Item Numbers.

690-6.2 Remove Poles:

690-6.2.1 Pole Removal Shallow: The quantity to be paid for will be the removal of each pole including the foundation and all accessories or attachments to a depth not less than 4 feet below existing grade.

690-6.2.2 Pole Removal Deep: The quantity to be paid for will be the complete removal of the pole and foundation including all accessories or attachments.

690-6.3 Remove Signal Pedestal: The quantity to be paid for will be the complete removal of each pedestal including the foundation and all accessories or attachments.

690-7 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 690- 10-	Remove Traffic Signal Head Assembly - each.
Item No. 690- 20-	Remove Pedestrian Signal Assembly - each.
Item No. 690- 31-	Remove Signal Pedestal - each.
Item No. 690- 32-	Pole Removal Shallow - each.
Item No. 690- 34-	Pole Removal Deep - each.
Item No. 690- 50-	Remove Controller or Cabinet - each.
Item No. 690- 60-	Remove Vehicular Detector Assembly - each.
Item No. 690- 70-	Remove Pedestrian Detector Assembly - each.
Item No. 690- 80-	Remove Span Wire Assembly - each.
Item No. 690- 90-	Remove Cabling and Conduit - per intersection or interchange.
Item No. 690-100-	Remove Miscellaneous Traffic Control Signals and Devices - per site.

700 HIGHWAY SIGNING.
(REV 8-11-10) (FA 8-16-10) (1-11)

SECTION 700 (Pages 779-786) is deleted and the following substituted:

SECTION 700
HIGHWAY SIGNING

700-1 Description.

Furnish and erect roadway signs, 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 and retroreflective unless otherwise noted in the plans.

The Department designates Ground Traffic Signs as signs erected on the shoulders, slopes, or medians, but not extending over the traveled roadway.

The Department 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.

The Department designates signs that include certain electronic display components as Electronic Display Signs (EDS) and may further classify them as Electronic Warning Signs (EWS), Electronic Regulatory Signs (ERS), Electronic Speed Feedback Signs (ESFS), or Blank Out Signs (BOS). EDS may be erected on the shoulders, slopes, or in the medians, or installed on mast arms, monotube assemblies, or span wires.

700-2 Sign Assembly Design Requirements.

700-2.1 General: Sign assemblies as specified in the plans fall into three general categories: ground sign assemblies, overhead sign assemblies, and electronic display signs.

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 for Ground Traffic Signs:

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 Department and listing on QPL. The QPL shall classify these systems as directional or omnidirectional 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 Department 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 Department 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 Department 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.

700-2.6 Breakaway Support Mechanisms for Electronic Display Signs: Provide posts or posts with slip bases as shown in the plans.

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.

700-3.9 Electronic Display Signs: Use electronic display signs and mounting hardware that meet the requirements of the MSTCSD and are listed on the Department's Approved Products List.

Use only new signs and mounting hardware.

Provide signs marked in accordance with Section 603 and ensure the markings are visible after installation.

Provide installation guides and operator's manuals for each EDS. Ensure the manuals include functional block diagrams and wiring diagrams; with information required to operate, maintain, troubleshoot, and repair the EDS; and with recommended maintenance and calibration procedures.

Ensure signs have a manufacturer's warranty covering defects in assembly, fabrication, and materials for a minimum of three years from the date of final acceptance in accordance with 5-11. Ensure Guaranties on EDS comply with Section 608.

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 Department.

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.

700-6.6 Electronic Display Signs: In addition to the requirements of this Section, meet the requirements of Section 611.

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 Department 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 yd³. 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.

Attach electronic display signs to the supporting structure in accordance with the manufacturer's recommendations using the mounting hardware provided by the manufacturer.

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.

Notify the Engineer a minimum of 30 days prior to removal of existing Logo sign structures.

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.

(5) The number of electronic display signs, of each designated class of assembly, complete.

(6) The number of flashing beacon signs, 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 lighted signs, include all costs of the electrical installation for lighting, up to the point of connection by others; for flashing beacon signs, include all costs of beacons, controllers, and electrical installation, up to the point of connection by others; and all other work specified in this Section, including all incidentals necessary for the complete item.

701 AUDIBLE AND VIBRATORY PAVEMENT MARKINGS.

(REV 4-28-10) (FA 5-7-10) (8-10)

SECTION 701 (Pages 787 – 790) is deleted and the following substituted:

SECTION 701 AUDIBLE AND VIBRATORY PAVEMENT MARKINGS

701-1 Description.

Apply audible and vibratory pavement markings in accordance with the Contract Documents.

701-2 Materials.

701-2.1 Thermoplastic: Use thermoplastic material meeting the requirements of 971-1 and 971-9 and listed on the Qualified Products List (QPL) as an approved system. The Engineer will take random samples of the materials in accordance with the Department's Sampling, Testing and Reporting Guide schedule.

701-2.2 Retroreflective Elements: Use reflective elements recommended by the manufacturer that meet the requirements of 971-1.7 and are part of the system listed on the QPL.

701-3 Equipment.

Use equipment capable of providing continuous, uniform heating of the striping material to temperatures exceeding 390°F, mixing and agitating the material in the reservoir to provide a homogenous mixture without segregation. Use equipment that will maintain the striping material

in a plastic state, in all mixing and conveying parts, including the line dispensing device until applied. Use equipment which is capable of producing a consistent pattern of transverse bumps positioned at regular and predetermined intervals. Use equipment which meets the following requirements:

(a) capable of traveling at a uniform rate of speed, both uphill and downhill, to produce a uniform application of striping material and capable of following straight lines and making normal curves in a true arc.

(b) capable of applying reflective elements to the surface of the completed stripe by automatic dispensers attached to the striping machine such that the reflective elements are dispensed closely behind the installed line. Use reflective element dispensers equipped with an automatic cut-off control that is synchronized with the cut-off of the thermoplastic material and applies the reflective elements uniformly on the entire traffic stripe surface with 50 to 60% embedment.

(c) equipped with a special kettle for uniformly heating and melting the striping material. The kettle must be equipped with an automatic temperature control device and material thermometer for positive temperature control and to prevent overheating or scorching of the thermoplastic material.

(d) meets the requirements of the National Fire Protection Association, state and local authorities.

701-4 Application.

701-4.1 General: Before applying traffic stripes and markings, remove any material that would adversely affect the bond of the traffic stripes by a method approved by the Engineer.

Before applying traffic stripes to any Portland cement surface, apply a primer, sealer or surface preparation adhesive of the type recommended by the manufacturer. Offset longitudinal lines at least 2 inches from construction joints of Portland cement concrete pavement.

Apply traffic stripes or markings only to dry surfaces, and when the ambient air and surface temperature is at least 50°F and rising for asphalt surfaces and 60°F and rising for concrete surface.

Apply striping to the same tolerances in dimensions and in alignment specified in 710-5. When applying traffic stripes and marking over existing markings, ensure that not more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.

Conduct field tests in accordance with FM 5-541. Remove and replace markings not meeting the requirements of this Section.

701-4.2 Thickness: Apply base lines having a thickness of 0.100 to 0.150 inches, exclusive of the audible bumps, when measured above the pavement surface at the edge of the base line.

As an alternative to the flat base line, a profiled baseline meeting the following dimensions may be applied. The profiled baseline shall have a minimum height of 0.155 inches, when measured above the pavement surface at the edge of the inverted rib profile. The thickness in the bottom of the profile marking shall be 0.035 to 0.050 inches. The individual profiles shall be located transversely across the full width of the traffic stripe at approximately 1.0 inch on center, with a bottom width between 0.090 to 0.310 inches.

Measure, record and certify on a Department approved form and submit to the Engineer, the thickness of white and yellow pavement markings in accordance with FM 5-541.

701-4.3 Dimensions of Audible Bumps: Apply the raised bumps with a profile such that the leading and trailing edges are sloped at a sufficient angle to create an audible and vibratory warning.

Bumps on shoulder and centerline markings shall have a minimum height of 0.45 inches, including the base line. The height shall be measured above the pavement surface at the edge of the marking, after application of drop-on reflective elements. Bumps shall have a minimum dimension of 2.5 inches. The bumps may have a drainage channel, the width of each drainage channel will not exceed 1/4 inch at the bottom of the channel. The longitudinal distance between bumps shall be approximately 30 inches.

701-4.4 Retroreflectivity: Apply white and yellow audible and vibratory markings that will attain an initial retroreflectance of not less than 300 mcd/lx·m² and not less than 250 mcd/lx·m², respectively. Measure, record and certify on a Department approved form and submit to the Engineer, the retroreflectivity of white and yellow pavement markings in accordance with FM 5-541.

The Department reserves the right to test the markings within 3 days of receipt of the Contractor's certification. If the retroreflectivity values measure below values shown above, remove and reapply the striping.

701-4.5 Color: Use pavement marking materials that meet the requirements of 971-1.

701-4.6 Reflective Elements: Apply reflective elements to all markings at the rates determined by the manufacturer's recommendations as identified for the QPL System.

701-4.7 Loss: If more than 1% of the bumps or more than three consecutive bumps are missing or broken (less than half a bump remaining) within the first 45 days under traffic, replace all failed bumps at no expense to the Department. If more than 2% of the bumps fail within the first 45 days under traffic, the replacement period will extend an additional 45 days from the date all replacement bumps were installed. If, at the end of the additional 45 days, more the 2% of all bumps (initial and replacement) fail, replace all failed bumps at no expense to the Department. Measure, record and certify on a Department approved form and submit to the Engineer, the loss of bumps.

701-5 Contractor's Responsibility for Notification.

Notify the Engineer prior to the placement of audible and vibratory markings. Furnish the Engineer with the manufacturer's name and batch numbers of the thermoplastic materials and reflective elements to be used. Ensure that the batch numbers appear on the thermoplastic materials and reflective elements packages.

701-6 Protection of Newly Applied Audible and Vibratory Markings.

Do not allow traffic onto or permit vehicles to cross newly applied pavement markings until they are sufficiently dry. Remove and replace any portion of the pavement markings damaged by passing traffic or from any other cause.

701-7 Observation Period.

Pavement markings are subject to a 180 day observation period under normal traffic. The observation period will begin with the satisfactory completion and acceptance of the pavement marking work.

The pavement markings shall show no signs of failure due to blistering, excessive cracking, chipping, discoloration, poor adhesion to the pavement, loss of reflectivity or vehicular

damage. The retroreflectivity shall meet the initial requirements of 701- 4.4. The Department reserves the right to check the color and retroreflectivity anytime prior to the end of the observation period.

Replace, at no expense to the Department, any pavement markings that do not perform satisfactorily under traffic during the 180 day observation period.

701-8 Corrections for Deficiencies.

Correct all deficiencies by removal and reapplication of a 1.0 mile section centered around the deficiency at no cost to the Department.

701-9 Submittals.

701-9.1 Submittal Instructions: Prepare a certification of quantities, using the Department's current approved form, for each project in the Contract. Submit the certification of quantities and daily worksheets to the Engineer. The Department will not pay for any disputed items until the Engineer approves the certification of quantities.

701-9.2 Contractor's Certification of Quantities: Request payment by submitting a certification of quantities no later than Twelve O'clock noon Monday after the estimate cut-off date or as directed by the Engineer, based on the amount of work done or completed. Ensure the certification of quantities consists of the following:

(a) Contract Number, FPID Number, Certification Number, Certification Date and the period that the certification represents.

(b) The basis for arriving at the amount of the progress certification, less payments previously made and less any amount previously retained or withheld. The basis will include a detailed breakdown provided on the certification of items of payment.

701-10 Method of Measurement.

The quantities to be paid for under this Section will be as follows:

(a) The length, in net miles, of 6 inches Solid Traffic Stripe, authorized and acceptably applied.

(b) The total traversed distance in gross miles of 10-30 skip line. The actual applied line is 25% of the traverse distance for a 1:3 ratio. This equates to 1,320 feet of marking per mile of single line.

701-11 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

Payment will be made under:

Item No. 701- 1 Audible and Vibratory Pavement Markings.

705 OBJECT MARKERS AND DELINEATORS

(REV 5-17-10) (FA 7-16-10) (1-11)

SUBARTICLE 705-2.1 (Page 790) is deleted and the following substituted:

705-2.1 General: Meet the following requirements:

Object Markers and Delineators.....Section 993

Retroreflective and Nonreflective

Sign Sheeting.....Section 994

709 TRAFFIC STRIPES AND MARKINGS – TWO REACTIVE COMPONENTS.

(REV 9-24-09) (FA 12-2-09) (7-10)

SECTION 709 (Pages 793 – 795) is deleted and the following substituted:

SECTION 709 TRAFFIC STRIPES AND MARKINGS – TWO REACTIVE COMPONENTS

709-1 Description.

Apply Two Reactive Component traffic stripes and markings in accordance with the Contract Documents.

709-2 Materials.

709-2.1 Two Reactive Components: Use only Two Reactive Component materials listed on the Qualified Products List (QPL) as an approved system and meet the requirements of 971-1 and 971-8. The Engineer will take random samples of the materials in accordance with the Department's Sampling, Testing and Reporting Guide schedule.

709-2.2 Reflective elements: Use only reflective elements recommended by the manufacturer that meet the requirements of 971-1.7 and are part of the system listed on the Qualified Products List (QPL).

709-3 Equipment.

Use equipment capable of applying the Two Reactive Component material to the pavement. Use equipment which can produce varying width traffic stripes and which meets the following requirements:

(a) capable of traveling at a uniform rate of speed, both uphill and downhill, to produce a uniform application of the Two Reactive Component material and capable of following straight lines and making normal curves in true arcs.

(b) capable of applying reflective elements to the surface of the completed stripe by an automatic reflective element dispenser attached to the striping machine such that the reflective elements are dispensed closely behind the installed line. Use a reflective element dispenser equipped with an automatic cut-off control that is synchronized with the cut-off of the material and applies the reflective elements in a manner such that the reflective elements appear uniform on the entire traffic stripes and markings surface with, 50 to 60% embedment.

(c) capable of providing the manufacturer's recommended mixing ratio between the components in a thorough and consistent manner.

709-4 Application.

709-4.1 General: Remove existing pavement markings, such that scars or traces of removed markings will not conflict with new stripes and markings by a method approved by the Engineer.

Before applying traffic stripes and markings, remove any material by a method approved by the Engineer that would adversely affect the bond of the traffic stripes.

Offset longitudinal lines at least 2 inches from construction joints of portland cement concrete pavement.

Apply traffic stripes or markings only to dry surfaces, and when the ambient air and surface temperature is at least 40°F and rising. Do not apply pavement markings when winds are sufficient to cause spray dust.

Apply striping to the same tolerances in dimensions and in alignment specified in 710-5. When applying traffic stripes and marking over existing markings, ensure that not more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.

Apply the Two Reactive Component product to the pavement in accordance with the manufacturer's instructions or as directed by the Engineer.

Conduct field tests in accordance with FM 5-541. Remove and replace traffic stripes and markings not meeting the requirements of this Section at no additional cost to the Department.

Apply all final pavement markings prior to opening the road to traffic.

709-4.2 Thickness: Apply traffic stripes and markings to attain a minimum wet film thickness in accordance with the manufacturer's recommendations as identified on the QPL system.

709-4.3 Retroreflectivity: Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than 450 mcd/lx·m² and not less than 350 mcd/lx·m², respectively for all longitudinal and transverse lines.

Measure, record and certify on the Department approved form and submit to the Engineer, the retroreflectivity of white and yellow pavement markings in accordance with Florida Method FM-5-541.

The Department reserves the right to test the markings within 3 days of receipt of the Contractor's certification. Failure to afford the Department opportunity to test the markings will result in non-payment. The test readings should be representative of the Contractor's striping performance. If the retroreflectivity values measure below values shown above, the striping will be removed and reapplied at the Contractor's expense.

709-4.4 Color: Use materials that meet the requirements of 971-1.

709-4.5 Reflective elements: Apply reflective elements to all white and yellow traffic stripes or markings, at the rates determined by the manufacturer's recommendations as identified on the QPL system.

709-5 Contractor's Responsibility for Notification.

Notify the Engineer prior to the placement of the materials. Furnish the Engineer with the manufacturer's name and batch numbers of the materials and reflective elements to be used. Ensure that the approved batch numbers appear on the materials and reflective elements packages.

709-6 Protection of Newly Applied Traffic Stripes and Markings.

Do not allow traffic onto or permit vehicles to cross newly applied pavement markings until they are sufficiently dry. Remove and replace any portion of the pavement markings damaged by passing traffic or from any other cause, at no additional cost to the Department.

709-7 Observation Period.

Pavement markings are subject to a 180 day observation period under normal traffic. The observation period shall begin with the satisfactory completion and acceptance of the work. The pavement markings shall show no signs of failure due to blistering, excessive cracking, chipping, discoloration, poor adhesion to the pavement, loss of reflectivity or vehicular damage. The retroreflectivity shall meet the initial requirements of 709-4.3. The Department reserves the right to check the color and retroreflectivity any time prior to the end of the observation period.

Replace, at no additional expense to the Department, any pavement markings that do not perform satisfactorily under traffic during the 180 day observation period.

709-8 Corrections for Deficiencies.

Deficiencies will be corrected by removal and reapplication of a 1.0 mile section centered around the deficiency at no additional cost to the Department.

709-9 Method of Measurement.

The quantities to be paid for under this Section will be as follows:

- (a) The length, in net miles, of 6 inch Solid Traffic Stripe, authorized and acceptably applied.
- (b) The total traversed distance in gross miles of 10-30 or 3-9 skip line. The actual applied line is 25% of the traverse distance for 1:3 ratio. This equates to 1,320 feet of marking per mile of single line.
- (c) The net length, in feet, of all other types of lines and stripes, authorized and acceptably applied.
- (d) The area, in square feet, of Remove Existing Pavement Markings, acceptably removed.

709-10 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

Payment will be made under:

Item No. 709	Two Reactive Components
	Traffic Stripes, Solid – per net mile.
	Traffic Stripes, Solid – per foot.
	Traffic Stripes, Skip – per gross mile.
	Traffic Stripe – Two Reactive Components, Remove – per square foot.

710 PAINTED PAVEMENT MARKINGS.
(REV 7-9-09) (FA 7-20-09) (1-10)

ARTICLE 710-2 (Page 796) is deleted and the following substituted:

710-2 Materials.

Use only materials listed on the Qualified Products List (QPL) meeting the following requirements:

Raised Retro-reflective Pavement Markers and Bituminous
AdhesiveSection 970
Standard Waterborne Fast Dry Traffic Paint
..... 971-1 and 971-3
Fast Dry Solvent Paint 971-1 and 971-4
Glass Spheres 971-1 and 971-2

The Engineer will take random samples of all material in accordance with the Department's Sampling, Testing and Reporting Guide schedule.

SUBARTICLE 710-4.1 (Pages 796 and 797) is deleted and the following substituted:

710-4.1 General: Remove existing pavement markings, such that scars or traces of removed markings will not conflict with new pavement markings, by a method approved by the Engineer. Payment for marking removal will be in accordance with 102-5.8.

Before applying traffic stripes and markings, remove any material by a method approved by the Engineer that would adversely affect the bond of the traffic stripes.

Apply traffic stripes and markings only to dry surfaces, and when the ambient air and surface temperature is at least 40°F and rising. Do not apply traffic stripes and markings when winds are sufficient to cause spray dust.

Apply traffic stripes and markings, having well defined edges, over existing pavement markings such that not more than 2 inches on either end and not more than 1 inch on either side is visible.

Mix the paint thoroughly prior to pouring into the painting machine. Apply paint to the pavement by spray or other means approved by the Engineer.

Conduct field testing in accordance with FM 5-541. Remove and replace traffic stripes and markings not meeting the requirements of this Section at no additional cost to the Department.

Apply all pavement markings prior to opening the road to traffic.

SUBARTICLE 710-4.1.1 (Page 797) is deleted and the following substituted:

710-4.1.1 Final Surface: Painted Pavement Markings (Final Surface) will include two applications of standard painted pavement markings and one application of retro-reflective pavement markers applied to the final surface. Wait at least 14 days after the first application to apply the second application of Painted Pavement Markings (Final Surface). Second application must be applied prior to final acceptance of the project.

Apply all retro-reflective pavement markers per the requirements of Section 706.

SUBARTICLE 710-4.3 (Page 797) is deleted and the following substituted:

710-4.3 Retroreflectivity: Apply white and yellow standard pavement markings that will attain an initial retroreflectance of not less than 300 mcd/lx·m² and not less than 250 mcd/lx·m², respectively. Measure, record and certify on a Department approved form and submit to the Engineer, the retroreflectivity of white and yellow pavement markings in accordance with Florida Method FM 5-541.

The Department reserves the right to test the markings within 3 days of receipt of the Contractor's certification. Failure to afford the Department opportunity to test the markings will result in non-payment. The test readings should be representative of the Contractor's striping performance. If the retroreflectivity values measure below values shown above, reapply the striping at no additional cost to the Department.

For standard pavement markings, ensure that the minimum retroreflectance of white and yellow pavement markings are not less than 150 mcd/lx m². If the retroreflectivity values fall below the 150 mcd/lx m² value within six months of initial application, the striping will be reapplied at the Contractor's expense.

711 THERMOPLASTIC TRAFFIC STRIPES AND MARKINGS.

(REV 5-6-09) (FA 6-24-09) (1-10)

SUBARTICLE 711-2.1.2 (Page 800) is deleted and the following substituted:

711-2.1.2 Refurbishing Existing Stripes and Markings: Use materials meeting the requirements of 971-1 and 971-5.

SUBARTICLE 711-2.1.3 (Page 800) is deleted and the following substituted:

711-2.1.3 Preformed Stripes and Markings: Use Materials meeting the requirements of 971-1 and 971-6.

SUBARTICLE 711-4.1 (Pages 801 and 802) is deleted and the following substituted:

711-4.1 General: Remove existing pavement markings such that scars or traces of removed markings will not conflict with new stripes and markings by a method approved by the Engineer. Cost for removing conflicting pavement markings during maintenance of traffic operations to be included in Maintenance of Traffic, Lump Sum.

Before applying traffic stripes and markings, remove any material by a method approved by the Engineer that would adversely affect the bond of the traffic stripes. Before applying traffic stripes to any Portland cement concrete surface, apply a primer, sealer or surface preparation adhesive of the type recommended by the manufacturer. Offset longitudinal lines at least 2 inches from any longitudinal joints of Portland cement concrete pavement.

Apply traffic stripes or markings only to dry surfaces, and when the ambient air and surface temperature is at least 50°F and rising for asphalt surfaces and 60°F and rising for concrete surfaces.

Apply striping to the same tolerances in dimensions and in alignment specified in 710-5. When applying traffic stripes and markings over existing markings, ensure that not more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.

Apply thermoplastic material to the pavement either by spray, extrusion or other means approved by the Engineer.

Conduct field tests in accordance with FM 5-541. Remove and replace traffic stripes and markings not meeting the requirements of this Section at no additional cost to the Department.

Apply all final pavement markings prior to opening the road to traffic.

SUBARTICLE 711-4.3 (Page 802) is deleted and the following substituted:

711-4.3 Retroreflectivity: Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than $450 \text{ mcd/lx}\cdot\text{m}^2$ and not less than $350 \text{ mcd/lx}\cdot\text{m}^2$, respectively for all longitudinal lines. All transverse lines, messages and arrows will attain an initial retroreflectivity of not less than $300 \text{ mcd/lx}\cdot\text{m}^2$ and $250 \text{ mcd/lx}\cdot\text{m}^2$ for white and yellow respectively. All pedestrian crosswalks, bike lane symbols or messages in a proposed bike lane shall attain an initial retroreflectivity of not less than $275 \text{ mcd/lx}\cdot\text{m}^2$.

Measure, record and certify on Department approved form and submit to the Engineer, the retroreflectivity of white and yellow pavement markings in accordance with Florida Method FM-5-541.

The Department reserves the right to test the markings within three days of receipt of the Contractor's certification. The test readings should be representative of the Contractor's striping performance. If the retroreflectivity values measure below values shown above, the striping will be removed and reapplied at the Contractor's expense.

ARTICLE 711-7 (Page 803) is deleted and the following substituted:

711-7 Observation Period.

Pavement markings are subject to a 180 day observation period under normal traffic. The observation period shall begin with the satisfactory completion and acceptance of the work.

The pavement markings shall show no signs of failure due to blistering, excessive cracking, chipping, discoloration, poor adhesion to the pavement, loss of reflectivity or vehicular damage. The retroreflectivity shall meet the initial requirements of 711-4.3. The Department reserves the right to check the color and retroreflectivity any time prior to the end of the observation period.

Replace, at no additional expense to the Department, any pavement markings that do not perform satisfactorily under traffic during the 180 day observation period.

713 PERMANENT TAPE STRIPES AND MARKINGS.
(REV 5-6-09) (FA 6-25-09) (1-10)

ARTICLE 713-2 (Page 805) is deleted and the following substituted:

713-2 Materials.

Use only permanent tape traffic stripes and markings materials listed on the Qualified Products List (QPL), meeting the requirements of 971-1 and 971-7. The Engineer will take random samples of the materials in accordance with the Department's Sampling, Testing and Reporting Guide schedule.

SUBARTICLE 713-4.1 (Pages 805 and 806) is deleted and the following substituted:

713-4.1 Removal of Existing Traffic Stripes: Remove existing traffic stripes and markings, such that scars or traces of removed markings will not conflict with new stripes and markings by a method approved by the Engineer.

Before applying traffic stripes and markings, remove any material by a method approved by the Engineer that would adversely affect the bond of the traffic stripes.

Apply a primer, sealer or surface preparation adhesive of the type recommended by the manufacturer. Ensure the tape stripes and markings adheres to the pavement surface.

Offset longitudinal lines at least 2 inches from construction joints on portland cement concrete pavement.

Apply traffic stripes or markings only to dry surfaces, and when the ambient air and surface temperature is at least 55°F and rising.

Apply striping to the same tolerances in dimensions and in alignment specified in 710-5. When applying traffic stripes and marking over existing markings, ensure that not more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.

Apply traffic stripes and markings to the pavement by means approved by the Engineer. The stripes and markings shall be installed immediately following the paving operation. Conduct field testing in accordance with FM 5-541. Remove and replace pavement stripes and markings not meeting the requirements of this Section at no additional cost to the Department.

Apply all final pavement markings prior to opening the road to traffic.

ARTICLE 713-7 (Page 806) is deleted and the following substituted:

713-7 Observation Period.

Pavement markings are subject to a 180 day observation period under normal traffic. The observation period shall begin with the satisfactory completion and acceptance of the work.

The pavement markings shall show no signs of failure due to blistering, excessive cracking, chipping, discoloration, poor adhesion to the pavement, loss of reflectivity or vehicular damage. The retroreflectivity shall meet the initial requirements of 713-4.3. The Department reserves the right to check the color and retroreflectivity any time prior to the end of the observation period.

Replace, at no additional expense to the Department, any pavement markings that do not perform satisfactorily under traffic during the 180 day observation period.

715 HIGHWAY LIGHTING SYSTEM.
(REV 1-22-10) (FA 2-10-10) (7-10)

ARTICLE 715-1 (Page 808) is expanded by the following:

715-1 Description.

Install a highway lighting system in accordance with the details shown in the plans. Include in the system the light poles, bases, luminaires, ballasts, pull boxes, cable, conduit, substations, expansion joints, protective devices, transformers and control devices; all as specified or required for the complete facility. Use pole assemblies listed on the Department's Qualified Products List (QPL) when standard aluminum pole assemblies or standard high mast light assemblies are required by the Contract Documents.

Provide metal lighting poles, excluding high mast lighting, with internal vibration damping devices in accordance with Design Standard 17515 in all installations on bridges, walls and concrete median barriers.

ARTICLE 715-16 (Pages 812 and 813) is deleted and the following substituted:

715-16 Method of Measurement.

The quantities to be paid for will be as follows, completed and accepted:

(a) Conduit: The length, in feet, including elbows, sweeps, connecting hardware, trenching and backfill as indicated in the plans and the Design Standards, and the cost of restoring cut pavement, sidewalks, sod, and etc., to its original condition.

(b) Luminaire and Truss Arm: The Contract unit price will include the truss arm, luminaire with lamp, and all necessary mounting hardware as indicated in the plans and the Design Standards.

(c) Load Center: The Contract unit price will include the service pole, insulators, weatherheads, transformers, enclosures, panel boards, breakers, safety switches, H.O.A. switches, lighting protectors, fuses, photo electric assembly, meter base, and all external and internal conduit and conductors for the service as indicated in the plans and the Design Standards.

(d) Light Pole Foundation: The Contract unit price will include the foundation and anchor bolts with lock nuts and washers as indicated in the plans and the Design Standards.

(e) Luminaire: The Contract unit price will include the luminaire with lamp and necessary mounting hardware as indicated in the plans and the Design Standards.

(f) Pull Box: The Contract unit price will include the pull box and cover as indicated in the plans and the Design Standards.

(g) High Mast Parts: The Contract unit price will include the part specified with all mounting hardware as indicated in the Contract Documents and the Design Standards.

(h) Frangible Base for Light Pole: The Contract unit price will include the frangible base, attachments, bolts, and washers as indicated in the plans and the Design Standards.

(i) Photo Electric Control Assembly: The Contract unit price will include the photo electric control, transformers, conduit, and conductors as indicated in the plans and the Design Standards.

(j) Pre-Fab Pilaster: The Contract unit price will include the pilaster and all mounting hardware as indicated in the plans.

(k) High Mast Lighting Pole Complete: The Contract unit price will include the pole, luminaires with lamps, lowering system, breakers, anchor bolts with lock nuts and washers, and foundation as indicated in the plans and the Design Standards.

(l) Conductor: The length, in feet, as indicated in the plans and the Design Standards.

(m) Lighting Pole Complete: The Contract unit price will include the pole, internal vibration damping device, truss arm, luminaire with lamp, anchor bolts with lock nuts and washers, frangible base and foundation.

(n) Pole Cable Distribution System: The Contract Unit price will include the surge protector, fuse holders with fuses, waterproof connectors and the waterproof wiring connection to the luminaries.

783 INTELLIGENT TRANSPORTATION SYSTEMS - FIBER OPTIC CABLE AND INTERCONNECT.

(REV 1-21-10) (FA 1-27-10) (7-10)

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

SECTION 783 INTELLIGENT TRANSPORTATION SYSTEMS FIBER OPTIC CABLE AND INTERCONNECT

783-1 Fiber Optic Cable System.

783-1.1 Description. Furnish and install a fiber optic cable system as shown in the plans.

783-1.2 Materials:

783-1.2.1 Fiber Optic Cable: Provide all-dielectric, dry-filled, loose-tube, dispersion- unshifted, single-mode fiber (SMF) with low water peak, gel free, and suitable for underground (i.e., in conduit) and aerial outside plant installation. All fiber optic cable shall be splice-compatible with the Department's existing dispersion-unshifted SMF and require no electronic equipment for dispersion compensation between new and existing fiber. Ensure that all components that comprise a single length of cable are continuous and of the same material. Furnish only commercial off-the-shelf materials, equipment, and components.

783-1.2.1.1 Optical Fiber: Ensure that the optical fibers used in the cable meet or exceed the Telecommunications Industry Association (TIA) and Electronic Industries Alliance (EIA) TIA/EIA-492-CAAB specification, the U.S. Department of Agriculture Rural Utilities Service (RUS) 7 CFR 1755.900, and International Telecommunication Union ITU-T G.652.D requirements. Use only optical fibers meeting the additional requirements as follows:

Geometry
Cladding Diameter: 125 μ m, \pm 0.7 μ m
Core-to-Cladding Concentricity: \leq 0.5 μ m
Cladding Noncircularity: \leq 0.7%

Mode Field Diameter: 1,550 nm; 10.4 μm , $\pm 0.5 \mu\text{m}$
Coating Diameter: 245 μm , $\pm 5 \mu\text{m}$
Colored Fiber Nominal Diameter: 250 $\pm 15 \mu\text{m}$
Optical
Cabled Fiber Attenuation: 1,310 nm, $\leq 0.4 \text{ dB/km}$; 1,550 nm, $\leq 0.3 \text{ dB/km}$
Point Discontinuity: 1,310 nm, $\leq 0.05 \text{ dB/km}$; 1,550 nm, $\leq 0.05 \text{ dB/km}$
Cable Cutoff Wavelength (λ_{cef}): $\leq 1,260 \text{ nm}$.
Total Dispersion: 1,625 nm $\leq 23.0 \text{ ps}/(\text{nm}\cdot\text{km})$
Macrobend Attenuation: Turns – 100; Outer diameter (OD) of the mandrel – 60 mm, $\pm 2 \text{ mm}$; $\leq 0.05 \text{ dB}$ at 1,550 nm
Cabled Polarization Mode Dispersion: $\leq 0.5 \text{ ps}/\sqrt{\text{km}}$

Ensure that each optical fiber is glass and consists of a germania-doped silica core surrounded by concentric silica cladding. Ensure that all fiber in the buffer tube is usable fiber that complies with attenuation requirements. Ensure that fibers do not adhere to each other. Ensure that the fiber is free of surface imperfections and inclusions. Ensure that all fiber optic core glass is from the same manufacturer.

783-1.2.1.2 Buffer Tubes: Ensure that the fiber optic cable includes loose buffer tubes that isolate internal optical fibers from outside forces and provide protection from physical damage as well as water ingress and migration. Ensure that buffer tubes provide freedom of movement for internal optical fibers. Ensure buffer tubes allow for expansion and contraction of the cable without damage to internal optical fiber. Ensure that fiber does not adhere to the inside of the tube. Ensure that buffer tubes permit intentional scoring and breakout without damage to the fiber. Ensure that each fiber optic cable buffer tube contains 12 fibers per tube unless otherwise noted in the plans.

783-1.2.1.3 Color Code: Ensure that the marking and color-coding of the fibers and buffer tubes conforms to telecommunication industry requirements as detailed in the TIA/EIA-598-B standard.

Ensure that colors are permanent and stable during temperature cycling, and not subject to fading or smearing onto each other or into the water-blocking material. Ensure that fibers are colored with UV curable inks that remain clearly distinguishable as the intended color.

783-1.2.1.4 Strength Member: Ensure that the fiber optic cable contains a dielectric central strength member and dielectric outside strength member to prevent buckling of the cable and provide tensile strength. Ensure that the fiber optic cable can withstand a pulling tension of 600 pounds during installation without increasing the fiber attenuation more than 0.8 decibel per mile, without changing other optical fiber characteristics after the tensile load is removed, and without damage to any components of the fiber optic cable.

783-1.2.1.5 Water Blocking Compound: Ensure that the fiber optic cable contains a dry water-blocking material to prevent the ingress of water within the outer cable jacket. Ensure that water-blocking materials are non-nutritive, dielectric, and homogeneous, and free from dirt and foreign matter. Use dry water-blocking material for fiber optic cables used for either aerial or underground installations. Apply dry water-blocking compound longitudinally around the outside of the central buffer tubes. Construct all cables with water-blocking material

that complies with the requirements of the EIA/TIA-455-81B standard and is subjected to water penetration tests as defined in the EIA/TIA-455-82B standard.

783-1.2.1.6 Ripcord: Ensure that the cable contains at least one ripcord under the sheath. Ensure that the ripcord permits the removal of the sheath by hand or with pliers.

783-1.2.1.7 Filler: Fillers or rods may be included in the cable core to lend symmetry to the cable cross section if required.

783-1.2.1.8 Outer Jacket: Ensure that the fiber optic cable is jacketed with medium density polyethylene (MDPE) that is free of blisters, cracks, holes, and other deformities. Ensure that the nominal jacket thickness is a minimum of 0.03 inch. Apply the jacketing material directly over the tensile strength members and water-blocking material. Ensure that the MDPE contains carbon black to provide ultraviolet (UV) protection and does not promote the growth of fungus.

Mark the jacket with the cable manufacturer's name, fiber type, fiber count, date of manufacture, the words "FDOT FIBER OPTIC CABLE," and the sequential cable lengths marked in feet. Ensure that the actual length of the cable is within 1% of the length indicated by the marking. Provide legible marking with contrasting color to that of the cable jacket.

783-1.2.1.9 Performance Requirements:

783-1.2.1.9.1 Operating Temperature: Ensure that the shipping and the operating temperature range of fiber optic cable meets or exceeds -30° to 165° F as defined in the environmental requirements section of the NEMA TS 2 standard. Ensure that the installation temperature range of fiber optic cable meets or exceeds -22° to 140° F.

783-1.2.1.9.2 Bend radius: Ensure that the fiber optic cable is capable of withstanding a minimum unloaded bend radius of 10 times the cable diameter and a minimum loaded bend radius of 20 times the cable diameter when loaded to pulling tension of 600 pounds. Test the cable as required in the EIA-455-33A standard. Ensure that bending the fiber optic cable up to the minimum bend radius does not affect the optical characteristics of the fiber.

783-1.2.1.9.3 Cable Strength: Ensure that the fiber optic cable is capable of withstanding a pulling tension of 600 pounds during installation without increasing the fiber attenuation more than 0.8 decibel per mile and without changing other optical fiber characteristics after the tensile load is removed. Ensure that optical fiber is proof-tested by the fiber manufacturer at a minimum of 100 kilo pounds per square inch. Ensure that the cable will withstand 25 impact cycles and the change in attenuation does not exceed 0.2 decibel at 1,550 nanometers when tested according to the requirements as detailed in the TIA/EIA-455-25B standard. Ensure that the fiber optic cable can withstand a minimum compression load of 125 pounds per square inch when applied uniformly over the length of the sample at the rate of 0.15 to 0.8 inch per minute and maintained for 10 minutes as defined in the TIA/EIA-455-41A standard. Ensure that the change in attenuation will not exceed 0.15 decibel during loading at 1,550 nanometers, and that no fiber displays a measurable change in attenuation after load removal.

783-1.2.1.9.4 Water Penetration: Ensure that the fiber optic cable is capable of withstanding the tests for water penetration defined in the TIA/EIA-455-82 standard. Ensure that a one-meter length of cable is able to withstand a one-meter static head of water applied at one end for 24 hours without water leaking through the other open cable end.

783-1.2.2 Splicing Materials: Ensure that all splice enclosures, organizers, cable end preparation tools, and procedures are compatible with the fiber optic cable, and are approved by the Engineer.

783-1.2.2.1 Splice Enclosures: Contain all optical fiber splices within a splice enclosure. Ensure that the enclosures provide storage for fiber splices, nonspliced fiber, and buffer tubes. Ensure that the splice enclosure restores the mechanical and environmental integrity of the fiber optic cable, encases the sheath opening in the cable, and organizes and stores optical fiber. Ensure all hinges and latching devices are stainless steel. Ensure that the enclosure is airtight and prevents water intrusion. Ensure that the splice enclosure can accommodate pressurization and has the ability to be reentered without requiring specialized tools or equipment. Ensure that the enclosure provides fiber and splice organizers including splice trays and strain relief.

Ensure that splice enclosures allow re-entry and are hermetically sealed to protect internal components from environmental hazards such as moisture, insects, and UV light. Fiber optic splice enclosures shall also:

Comply with the Telcordia Technologies' GR-711-CORE standard and all applicable NEC requirements.

Provide space for future expansion equal to 100% of the initial utilization.

Provide fiber optic cable penetration end caps to accommodate a minimum installation of two trunk fiber optic cables and two fiber optic drop cables. Ensure that the enclosure end caps are factory-drilled to the proper diameter to accept and seal the fiber optic cable entries. Ensure that the cable entry locations can accommodate an assortment of cables with ODs ranging from 0.45 to 0.55 inch, +10%, without jeopardizing the waterproof characteristics of the enclosure.

Provide fiber optic splice enclosures meeting the following requirements:

Mechanical
Resist compression deformation to a maximum of 400 pounds.
Withstand an impact energy to a maximum of 40 foot-pounds at 0° F.
Axial Tension: 100 pounds for 30 minutes.
Cable Torsion: ten 90-degree rotations.
Cable Flexing: ten 90-degree bends.
Environmental
Hydrostatic Pressure Head: Up to 20 foot-pounds (-9 pounds per square inch).
Withstand 40 freeze/thaw temperature cycles.
Ultraviolet resistant during a maximum 30-day exposure in compliance with the requirements detailed in the ASTM B117 standard.
Chemical
Withstand a 90-day exposure to solutions of 3% sulfuric acid, 0.2 normal of sodium hydroxide, 10% Igepal®, kerosene, and be fungus resistant as required in the ASTM G21 standard.

783-1.2.2.2 Splice Trays: Ensure that the splice trays are securely attached and accessible, and provide adequate storage for the fiber cable. Ensure the splice trays provide access to individual fibers without disrupting other fibers in the tray. Ensure that the splice trays hold the buffer tubes rigidly in place and provide protection for fusion splices. Ensure that the raceway accommodates the minimum bend radius of the fiber. Ensure that splice trays allow visible inspection of the fiber. Ensure that the splice tray includes a cover with a locking mechanism to hold it in place.

783-1.2.3 Cable Terminations: Use Type ST, SC, LC, or FC connectors only, as specified in the plans or by the Engineer. Ensure that all ST-type fiber optic connectors, whether factory pre-terminated or field-installed, are 0.1 inch physical contact with preradiused tips. Ensure that ST and FC connectors include a ceramic ferrule and a metallic body, and provide a strain relief mechanism when installed on a single fiber cable that contains strength elements. Ensure that the ST-type connector provides a minimum 50 pound pullout strength. Ensure that the optical fiber within the body of all connectors is mechanically isolated from cable tension, bending, and twisting.

Ensure that all connectors are compliant with the TIA/EIA-568-A and TIA/EIA-604 standards, as applicable, and are tested according to the Telcordia/Bellcore GR-326-CORE standard. When tested according to the TIA and EIA's Fiber Optic Test Procedure (FOTP)-171 (TIA/EIA-455-171), ensure that the connectors test to an average insertion loss of ≤ 0.4 decibel and a maximum loss of ≤ 0.75 decibel. Test the connectors as detailed in FOTP-107 (TIA/EIA-455-107) to reflectance values of ≤ -50 decibels.

Ensure that the ST-type connectors have an operating and storage temperature range of -30° to 165° F as per the NEMA TS 2 standard.

783-1.2.3.1 Pre-terminated Connector Assemblies (pigtails): Ensure that pre-terminated connector assemblies are used for fiber termination. Ensure that the pre-terminated cable assemblies consist of fiber optic cables with factory-installed ST-type connectors on one end of the cable and an un-terminated optical fiber on the other. Ensure that the pre-terminated connector assemblies are installed with fusion splices. Ensure that all buffer tubes and fibers are protected once the attachment of pre-terminated connector assemblies is complete.

783-1.2.3.2 Buffer Tube Fan-out Kits: Ensure that a buffer tube fan-out kit is installed when fiber optic cables are terminated. Use a kit compatible with the fiber optic cable being terminated and that is color-coded to match the optical fiber color scheme. Ensure that the buffer tube fan-out kit supports 12 fiber strands. Ensure that output tubing and the fiber strands contained therein are of sufficient length for routing and attachment of fiber optic cable to connected electronics or as directed by the Engineer. Ensure that the kit and the connectors are supplied by the same manufacturer.

783-1.2.4 Patch Panels: Ensure that the patch panel is compatible with the fiber optic cable being terminated and color-coded to match the optical fiber color scheme. Ensure that the patch panel has a minimum of twelve ST-type panel connectors. Ensure that the patch panel dimensions do not exceed 14 x 6 x 4 inches for fiber counts of twelve or less. Ensure the patch panel is suitable for mounting within an approved cabinet at the field device location. Ensure patch panels are sized to accommodate specified coupler housings and maintain sufficient bend radius for cables to maintain their specified optical performance. Ensure the patch panel is sized to occupy the minimum space required to adequately accommodate fiber capacity.

783-1.2.4.1 Pre-terminated Patch Panels: Ensure that the pre-terminated patch panel is a termination panel that includes a factory installed all-dielectric SMF cable stub. Ensure that the panel includes factory-installed and terminated ST-type panel connectors. Ensure that the cable stub is of adequate length to splice the stub and provide a fiber connection between the panel and the backbone fiber cable or as directed by the Engineer.

783-1.2.4.2 Field Assembled and Terminated Patch Panels: Ensure that the field-assembled patch panel is a termination panel that includes a connector panel and the hardware required to mount the patch panel within an approved cabinet at the field device location and connect the panel to the backbone fiber cable.

783-1.2.4.2.1 Connector Panel: Ensure that the connector panel provides twelve ST-type, bulkhead-mount coupling connectors. Ensure that each coupling connector allows connection of a cable terminated on one side of the panel to a cable on the opposite side.

Ensure that each bulkhead-mount coupling connector includes a locknut for mounting the connector in predrilled or punched holes in the connector panel.

783-1.2.5 Handling:

783-1.2.5.1 Cable End-Sealing: Ensure that fiber optic cable ends are capped or sealed to prevent the entry of moisture during shipping, handling, storage, and installation. Equip one end of the fiber optic cable with flexible pulling eyes.

783-1.2.5.2 Protective Wrap: Ensure that the fiber optic cable is shipped and stored with a protective wrap or other approved mechanical reel protection device over the outer turns of the fiber optic cable on each reel. Ensure that the wrap is weather resistant and protects the cable reel from environmental hazards. Ensure that the cable reel remains wrapped until cable is to be installed.

783-1.2.5.3 Packaging, Shipping and Receiving: Ensure that the packaging and delivery of fiber optic cable reels comply with the following minimum requirements:

1. Ensure cable is shipped on reels of marked continuous length.
2. Ensure each cable is shipped on a separate, strongly constructed reel designed to prevent damage to the cable during shipment and installation.
3. Ensure each reel has a minimum of 6 feet on each end of the cable available for testing.
4. Ensure that all fiber optic cable is continuous and free from damage.
5. Ensure no point discontinuities greater than 0.1 decibel per reel.
6. Ensure that all cable delivered has been manufactured within 6 months of the delivery date.
7. Provide a copy of the transmission loss test results as required by the EIA/TIA-455-61 standard, as well as results from factory tests performed prior to shipping.
8. Ensure that the manufacturer provides the date of manufacture; product and serial numbers; cable data, including the reel length; refraction index; the project name and location; type of fiber and quantity of strands used; technical product data sheet(s); and reel number(s).

783-1.3 Installation: Install all equipment according to the latest version of the manufacturer's installation procedures and the industry-accepted installation standards, codes, and practices, or as directed by the Engineer. Ensure that all materials and installation practices are in accordance with the applicable OSHA requirements as found in 29 Code of Federal Regulations (CFR) Part 1926, Safety and Health Standards for Construction. In addition, perform the following:

1. Ensure conduit and inner-duct is clean and free from damage prior to installing fiber optic cable.

2. Document the sequential cable length markings at each splice box and pull box wall that the cable passes through, and include the information with the as-built documentation.

Provide all incidental parts needed to complete the installation, but not specified in the plans, as necessary for a complete and properly operating system.

783-1.3.1 Fiber Optic Cable Installation: Develop a nomenclature plan for identification of fiber optic cable. Submit the nomenclature plan to the Engineer for approval. Use approved cable nomenclature to create cable tags for the identification of fiber optic cable. Provide cable tag identification on all test results or fiber related documents provided to the Engineer.

Install cable tags within 1 foot of each splice and/or termination point indicating the cable type, fiber count, and each fiber optic cable's origination and termination points. Ensure that the cable tags are permanent labels suitable for outside plant applications and are affixed to all fiber optic cables. Ensure that lettering is in permanent ink and displays the phrase "FDOT FIBER OPTIC CABLE".

783-1.3.1.1 Pulling: Install the fiber optic cable by hand or by using a mechanical pulling machine. If a mechanical pulling machine is used, equip the machine with a monitored or recording tension meter. Ensure that at no time the manufacturer's recommended maximum pulling tension is exceeded. Ensure that the central strength member and aramid yarn are attached directly to the pulling eye during cable pulling. Use pulling attachments, such as "basket grip" or "Chinese finger" type, to ensure that the optical and mechanical characteristics are not degraded during the fiber optic cable installation.

Ensure that excess cable is coiled in a figure eight and fed manually when pulling through pull boxes and splice boxes by hand. If pulleys and sheaves will be used to mechanically pull through pull boxes and splice boxes, provide a drawing of the proposed layout showing that the cable will never be pulled through a radius less than the manufacturer's minimum bend radius. Use large diameter wheels, pulling sheaves, and cable guides to maintain the appropriate bend radius. Provide tension monitoring at all times during the pulling operation. Ensure that cable pulling lubricant used during installation is recommended by the optical fiber cable manufacturer.

783-1.3.1.2 Blowing: Use either the high-air-speed blowing (HASB) method or the piston method. When using the HASB method, ensure that the volume of air passing through the conduit does not exceed 600 cubic feet per minute or the conduit manufacturer's recommended air volume, whichever is more restrictive. When using the piston method, ensure that the volume of air passing through the conduit does not exceed 300 cubic feet per minute or the conduit manufacturer's recommended air volume, whichever is more restrictive.

783-1.3.1.3 Slack Cable Storage: Provide and store fiber optic cable at each pull box and splice box to allow for future splices, additions, or repairs to the fiber network. Store the fiber optic cable without twisting or bending the cable below the minimum bend radius.

Store a total of 200 feet of fiber optic cable in splice boxes, with 100 feet of cable on each side of the cable splice point or as shown in the plans.

Store 50 feet of spare fiber optic cable in pull boxes.

783-1.3.2 Splicing: Perform all optical fiber splicing using the fusion splicing technique, and according to the latest version of the manufacturer's cable installation procedures; industry-accepted installation standards, codes, and practices; or as directed by the Engineer. Ensure that all splices match fiber and buffer tube colors unless shown otherwise in the plans. Where a fiber cable is to be accessed for lateral or drop signal insertion, only open the buffer tube containing the fiber to be accessed and only cut the actual fiber to be accessed. If a fiber end is not intended for use, cut the fiber to a length equal to that of the fiber to be used and neatly lay it into the splice tray. Treat any fibers exposed during splicing with a protective coating and place in a protective sleeve or housing to protect the fiber from damage or contaminants.

783-1.3.2.1 Splice Plan: Provide a splice plan showing the location and configuration of splices in the system for approval by the Engineer. Perform all splicing according to the plan. Document each splice location and identify the source and destination of each fiber in each splice tray. Document all fiber colors and buffer jacket colors used during installation, and develop a sequential fiber numbering plan as required in the TIA/EIA-598-A standard for color-coding in the documentation.

Neatly store all splice enclosures within a splice box. Attach the splice enclosure to the splice box interior wall to prevent the enclosure from lying on the bottom of the splice box.

783-1.3.2.2 Splice Equipment Specifications: Use a fusion splice machine to splice all optical fiber. Ensure that the unit is portable, and capable of 120 V_{AC} and internal battery-powered operation. Ensure that the unit is able to splice fibers with a 250-micrometer coating. The fusion splice machine shall have the following capabilities:

1. Splice loss measurement.
2. Splice protection sleeve heater.
3. Battery with charging unit and power cable.
4. Spare electrodes, fuses, and lamps.
5. Power meter/light source with carrying case.

Ensure that the power meter/light source is a calibrated pair that is portable and battery operated. Ensure that the power meter/light source operates at selectable wavelengths of 850/1,300/1,550 nanometers. Ensure that the power meter has a decibel milliwatt measurement scale with a range of +3 to -45 decibel milliwatts for SMF operation and an accuracy of 0.5 decibel or better.

Ensure that the splice machine is new from the factory, or serviced and certified by the factory or its authorized representative within the previous 6 months from the commencement of its use. Provide the Engineer with a letter from the manufacturer or his authorized representative certifying compliance. Clean all splicing equipment and calibrate according to the manufacturer's recommendations prior to each splicing session at each location.

783-1.3.3 Cable Termination Installation: Ensure that cables, buffer tubes, or strands are neatly routed, secured and terminated in a patch panel. Ensure all cable termination points include documentation regarding the identification, route, and function of each fiber

installed at that location. Ensure that at least one copy of this information is placed alongside the installed equipment (for instance, in a document pouch or drawer within a field cabinet).

783-1.3.4 Patch Panel Installation: Ensure that patch panels neatly installed and secured in a weather proof enclosure. Ensure all patch panel connectors are clearly and permanently labeled. Ensure all installed patch panels include documentation regarding the identification, route, and function of each patch panel connector at that location. Ensure that at least one copy of this information is placed alongside the installed equipment.

783-1.4 Testing and Certification:

783-1.4.1 Manufacturer's Testing: Provide documentation of all factory tests performed by the manufacturer for all fiber optic cable, splicing material, cable terminations, and patch panels.

783-1.4.2 Installation Testing: Notify the Engineer of cable testing at least 14 calendar days in advance. Provide the testing procedures to the Engineer for approval prior to commencement of testing. Perform all tests at 1,310/1,550 nanometer wavelengths, and include the last calibration date of all test equipment with the test parameters set on the equipment in the test documentation. Test all installed fibers (terminated and un-terminated) using methods approved by the Engineer.

783-1.4.2.1 End to End Attenuation Testing: Perform testing on all fibers to ensure that end to end attenuation does not exceed allowable loss (0.4 db/km for 1310nm wavelength, 0.3 db/km for 1550nm wavelength, plus 0.5 db for any connectors and 0.1 db for splices). Repair or replace cable sections exceeding allowable attenuation at no cost to the Department.

783-1.4.2.2 OTDR Tracing: Test all fibers from both cable end points with an optical time domain reflectometer (OTDR) at wavelengths of 1310 and 1550 nm. Test the fibers that are not terminated at the time of installation using a bare fiber adapter. Present the results of the OTDR testing (i.e., traces for each fiber) and a loss table showing details for each splice or termination tested to the Engineer in an approved electronic format. Ensure all OTDR testing complies with the EIA/TIA-455-61 standard.

783-1.4.2.3 Splice Loss Testing: Ensure that the splice loss for a SMF fusion splice does not exceed a maximum bidirectional average of 0.1 decibel per splice. Repair or replace splices that exceed allowable attenuation at no cost to the Department.

783-1.4.2.4 Connector Loss Testing: Ensure that the attenuation in the connector at each termination panel and its associated splice does not exceed 0.5 decibel. Repair or replace connectors exceeding allowable attenuation at no cost to the Department.

783-2 Conduit and Locate System.

783-2.1 General: Furnish and install conduit and a locate system for fiber optic cable. Ensure that the conduit complies with the requirements of Section 630.

Place the locate system along any underground conduit installation. Ensure that the locate system includes aboveground route markers, warning tape, tone wire, and electronics that allow detection of buried conduit and other related underground facilities.

Furnish and install a system as shown in the plans and as directed by the Engineer. Ensure that the locate system provides:

1. An end-to-end electrical conductor, such as a locate wire, buried along the conduit system for conductive facility locating.
2. Visual notification of the presence of conduit installed on Department projects.

3. Public notification of potential hazards and contact information for public or private inquiries regarding the conduit system.

4. A means of locating any conduit system pull box or splice box that is buried.

5. Surge protection and dissipation of transient voltages that may be induced into the route marker system.

783-2.2 Materials:

783-2.2.1 Route Markers: Mark the location of the conduit system with rigid sign posts known as route markers. Use route markers of the type shown in the plans and approved by the Engineer. Route markers may be either a Standard Route Marker (SRM) type or an Electronic Route Marker (ERM) type. The SRM is a rigid, tubular, driven post used for location and notification purposes only. The ERM should be physically identical to the SRM, but also include a termination board to provide aboveground access to locate wire buried alongside conduit and cable runs.

Ensure that each SRM is labeled and identified as an FDOT fiber optic cable marker as shown in the plans and approved by the Engineer. Ensure that labels include the Department's logo, contact information for the local FDOT District, and a telephone number to call prior to any excavation in the area. Ensure that the identification information is permanently imprinted on the top fitting, and will not peel, fade, or deteriorate with prolonged exposure to the typical roadside environmental hazards. Ensure that all route markers used on the project are new and consistent in appearance.

783-2.2.1.1 Standard Route Marker: Ensure that the SRM post is white with a top fitting cover that is orange with white lettering and graphics. Ensure that the SRM is a tubular configuration, and both the marker post and the top fitting are made from virgin Type 111 high-density polyethylene (HDPE). Ensure that any fasteners used with the SRM are constructed of stainless steel.

Ensure that all SRMs have a minimum OD of 3.5 inches with a minimum 0.125-inch wall thickness. Ensure that the top fitting cover is a minimum of 1.5 feet long and has an OD of 3.75 inches with a 0.125-inch wall thickness. Ensure that each SRM provides a tensile strength of 4,200 pounds per square inch as required in the ASTM D638 standard. Ensure that each SRM is manufactured for use in temperatures range of -30° to 165° F as per the NEMA TS 2 standard.

Ensure that each SRM can withstand 70 foot-pounds of impact force at 32° F as required in the ASTM D2444 standard before and after UV conditioning for 2,000 hours as required in the ASTM G53-88 standard. Ensure that the control sample of any material employed maintains a minimum of 70 percent of its original tensile strength as required by the ASTM D638 standard.

Ensure that an SRM installed at the minimum 2-foot depth withstands at least one vehicle impact at 45 miles per hour by a car or truck weighing no less than 3,500 pounds. After impact, ensure that the post returns to an upright position within 10 degrees of vertical alignment within 30 seconds from the time of impact. Ensure that all SRMs withstand a 12-gauge shotgun blast without penetration by any pellets when fired from a 50-foot distance.

783-2.2.1.2 Electronic Route Marker: Ensure that the ERMs meet the same material and performance requirements as the SRMs with the following exceptions. Equip

each ERM with a removable, top-fitting cover that is black with white lettering. Ensure that each ERM contains a terminal board equipped with locate wire and ground connectors.

Ensure that the terminal board is made from corrosion-resistant materials and includes terminal facilities labeled according to function. Ensure the terminal board includes uniform spacing between connection points.

783-2.2.2 Warning Tape: Ensure that the buried cable warning tape is flexible, elastic material 3 inches wide, 6 mil thick, intended for burial and use as an underground utility warning notice. Ensure that the surface of the warning tape is coated and sealed to prevent deterioration caused by harsh soil elements. Ensure that the tape material and ink colors do not change when exposed to acids, alkalis, and other destructive chemical variances commonly found in Florida soils. Ensure that the warning tape color is orange as required by the American Public Works Association (APWA) Uniform Color Code, and has “CAUTION: FDOT FIBER OPTIC CABLE BURIED BELOW,” or other wording approved by the Engineer, permanently printed on its surface.

Include buried cable warning tape with all conduit.

Include buried cable warning tape with all conduit.

783-2.2.3 Locate Wire: Ensure that the locate wire and locate wire splices comply with Section 630.

783-2.2.3.1 Locate Wire Surge Protection: Furnish and install a locate wire surge protection system as shown in the plans or directed by the Engineer. Ensure that locate wires are attached to a surge protection system dedicated to safely dissipating high transient voltages or other foreign electrical surges induced into the designating system. Provide this grounding through a stand-alone system that does not include electric power or ITS device grounding. Ensure that the surge protection system allows signals generated by locate system transmitters to pass through the protection system without going to ground. Ensure that the protection system automatically resets and passes locate system transmitter signals after the unit has grounded to dissipate over-voltages. Ensure that the locate wire surge protection is intended for below- or above-grade applications. Ensure that the locate wire surge protection system is grounded to a driven rod within 10 feet of the system using a AWG #6 single conductor wire with green insulation. Ensure that the locate wire surge protection is enclosed for protection from environmental hazards and accessible for connection of portable locate system transmitters.

Ensure that the locate wire surge protection system meets the following minimum standards for surge protection:

Surge Element	3-element maximum duty fail-safe gas tube.
Rating	40,000 A surge capacity (single-cycle, 8 by 20 microsecond waveform).
Life	Minimum 1,000 surges (1000 A to ground).
Fail-Safe	Integral fail-shortened device.
Insulation Resistance	1,000 megohm minimum at 100 volts of direct current (V_{DC}).
Clamp Voltages	a. Impulse at 100 Volts per Microsecond: Typically 500 volts. b. Direct Current: 300 to 500 volts.

783-2.2.4 Locate System Electronic Equipment: Provide locate system electronic equipment that is designed specifically for locating buried pipes and cables. Ensure

that the locate system electronic equipment is able to detect the location and depth of the locate wire buried alongside conduit and cable runs. Ensure that the locate system electronic equipment is capable of locating faults in the sheath of a buried locate wire. Ensure that locate system electronic equipment is provided with protective cases suitable for daily transport and storage of transmitters and receivers. Ensure that the locate system electronic equipment includes a transmitter, receiver, and electronic box markers as shown in the plans and approved by the Engineer.

783-2.2.4.1 Transmitter: Ensure that the transmitter is a portable unit designed to create and apply an identifiable signal onto a locate wire so that it can be located and traced with a receiver. Ensure the transmitter is capable of applying a trace signal using direct connection and inductive methods. Ensure that the transmitter output circuitry is protected against inadvertent connection to conductors carrying voltages up to 250V at 50/60Hz.

Deliver the transmitter to the Engineer upon completion of the installation and acceptance of the work.

783-2.2.4.1.1 Electrical Specifications: Ensure that the system operates using 120V_{AC} input power as well as self-contained, rechargeable battery power. Ensure that the transmitter can operate from battery power for a minimum of 10 hours per charge. Ensure that the transmitter is supplied with all chargers, cords, cables, and accessories required for standard operation.

783-2.2.4.1.2 Mechanical Specifications: Ensure that the transmitter's physical dimensions allow portability and storage in a case no larger than 16 inches x 12 inches x 5 inches. Ensure that the transmitter weight does not exceed 10 pounds.

783-2.2.4.1.3 Environmental Specifications: Ensure that the transmitter is constructed with impact-resistant materials, is weather resistant, and designed to operate unattended in all weather and climates found in the outdoor roadside environment. Ensure that operating temperature meets or exceeds -4° to 122° F.

783-2.2.4.1.4 Operation and Display: Ensure that the transmitter includes programming buttons and visual indicators or displays for self-contained setup and operation. Ensure that all transmitter functions and operational parameters are programmable using an onboard, man-machine interface. Ensure that the operational status, including battery strength and current device settings, are displayed on the transmitter.

783-2.2.4.1.4.1 Transmitter Output: Ensure that the transmitter is capable of generating radio frequency (RF) signals and audio tones. Ensure that RF and audio output levels are user selectable.

783-2.2.4.1.4.2 Output Frequency Requirements: Ensure that RF frequencies produced for locate operations are user-selectable. Ensure that the transmitter produces consistent, stable, and defined frequencies normally associated with locating and marking equipment. Ensure that the transmitter can transmit at least three different user-selectable frequencies, with at least one frequency in each of three general ranges, defined here as low (0-1 kHz), mid-range (1 kHz – 40 kHz), and high (40 kHz – 85 kHz) bands.

783-2.2.4.2 Receiver: Ensure that the receiver is a portable hand-held unit ergonomically designed and intended for the purpose of locating underground utilities, conduit, cable, and pull and splice boxes. Ensure the receiver is capable of receiving all of the signals generated by the transmitter as well as those associated with electronic box markers. Ensure that the receiver can serve as a marker locator by energizing and detecting electronic box markers. Ensure that the receiver can passively locate cables transmitting power and RF signals.

Deliver the receiver to the Engineer upon completion of the installation and acceptance of the work.

783-2.2.4.2.1 Electrical Specifications: Ensure that the system operates using self-contained, rechargeable battery power. Ensure that the receiver can operate from battery power for a minimum of 10 hours per charge. Ensure that the receiver is supplied with all chargers, cords, cables, and accessories required for standard operation.

783-2.2.4.2.2 Mechanical Specifications: Ensure that the receiver's physical dimensions allow portability and storage in a case no larger than 30 inches x 12 inches x 9 inches. Ensure that the receiver weight does not exceed 6 pounds.

783-2.2.4.2.3 Environmental Specifications: Ensure that the receiver is constructed with impact-resistant materials, is weather resistant, and designed to operate in all weather and climates found in the outdoor roadside environment. Ensure that operating temperature meets or exceeds -4° to 122° F.

783-2.2.4.2.4 Operation and Display: Ensure that the receiver includes programming buttons and a graphical display for self-contained setup and operation. Ensure that all receiver functions and operational parameters are programmable using an on-board man-machine interface. Ensure that current operational status, including battery strength and current device settings, and current signal strength from targets are displayed on the receiver. Ensure that receiver sensitivity is adjustable. Ensure that the receiver includes an internal speaker and headphone output that is able to provide audible tones that indicate received signal strength. Ensure audible outputs include on/off and volume control.

Ensure that the receiver is capable of locating buried locate wire and electronic box markers within $\pm 5\%$ of actual depth. Ensure that the receiver can detect the center line of a target locate wire within 3 inches of its actual location.

783-2.2.4.3 Electronic Box Marker: Equip all pull boxes and splice boxes buried below finish grade with an electronic box marker inside the pull box or splice box to mark the location. Ensure that the electronic box marker is a device specifically manufactured to electronically mark and locate underground facilities. Ensure that the electronic box marker includes circuitry and an antenna encased in a waterproof polyethylene shell. Ensure that the outer shell is impervious to minerals, chemicals, and temperature extremes normally found in underground plant environments. Ensure that the electronic box marker does not require any batteries or active components to operate. Ensure that electronic box markers used to mark fiber optic cable and general telecom applications are orange in color and operate at 101.4 kHz. When excited by a marker locator, ensure that the electronic box marker's passive circuits produce an RF field to direct the marker locator to its position. Ensure that the electronic box marker has a minimum operating range of 5 feet from the marker locator.

783-2.3 Installation Requirements:

783-2.3.1 Route Markers: Install route markers as shown in the plans and as directed by the Engineer. Ensure that route markers are plumb and level with the notification information clearly visible when viewed from the side facing the roadway. Place route markers at a 1 foot offset from the conduit system or as shown in the plans. Ensure that markers are set within the right-of-way.

Set the route markers concurrently with the conduit system installation and prior to the fiber cable installation. Install route markers of the type as shown in the plans and as follows:

- the next.
1. 1. So that a clear line of sight is maintained from one marker to the next.
 2. A maximum distance apart of 500 feet.
 3. On both sides of the road at any crossing point where the conduit system changes to the opposite side of the road.
 4. At the center point of any conduit run between two pull or splice boxes.
 5. At gate locations when the conduit system is adjacent to a fence line.
 6. On both sides of a stream, river, or other water crossing.
 7. On both sides of aboveground attachments, such as bridges and walls.

Remove and replace all marker posts damaged during installation at no additional cost. Ensure that the top of the marker post is a minimum of 5 feet and no more than 6 feet above the finish grade.

Ensure that route marker signs are labeled with a unique identification number, as detailed in the plans or as approved by the Engineer. Provide as-built documentation at the completion of installation that includes identification number and location of all installed route markers and correlates the marker to the fiber optic infrastructure that it signifies.

Ensure that installation of ERMs includes connection of the route marker to the locate wire associated with the conduit run that the markers identify. Install locate wire through the base of the marker and terminate the locate wires to connectors mounted on the terminal board inside the marker. Install an underground magnesium anode at a minimum of 10 feet away from the marker and perpendicular to the conduit system. Terminate the anode lead on the connector mounted on the terminal board inside the marker. Install the bond straps between the anode connector and all locate wire connectors to provide cathodic protection for the locate wire conductor.

783-2.3.2 Warning Tape: Install buried cable warning tape 1 foot below the finish grade, directly over any installed conduit and cable run.

783-2.3.3 Locate Wire: Ensure that the installation of locate wire and locate wire splices are compatible with Section 630.

783-2.3.4 Locate Wire Grounding Units: Install locate wire grounding units (WGUs) in pull boxes and splice boxes as shown in the plans or directed by the Engineer. Mount the device in a location high enough from the bottom of the box to allow access to terminal facilities without disturbing cables present within the box. Terminate the locate wires and connect the surge protection device to ground per the manufacturer's instructions. Do not use power utility ground(s) or any ITS device grounding system as the grounding point for WGUs.

783-2.3.5 Locate System Electronic Box Marker: Install an electronic box marker inside all pull boxes and splice boxes buried below finish grade at the time of installation. Place the electronic box marker on the floor or wall of the box. Ensure that the electronic box marker is installed less than 5 feet below finish grade.

783-2.4 Testing and Certification. Inspect all conduit route marker system components and approve prior to installation. Fully test the locate wire system after installation to ensure that it functions and can be used to accurately locate the conduit system.

Ensure that the conduit route marker system is fully functional prior to installing the fiber optic cable.

783-3 Pull Boxes and Splice Boxes for Fiber Optic Cable.

783-3.1 Description: Furnish and install pull boxes and splice boxes of the type, size, and quantity as shown in the plans. Ensure that pull boxes and splice boxes also conform to the requirements of Section 635. Use only equipment and components that meet the requirements of these minimum specifications, and are listed on the Department's Approved Product List (APL).

Use pull boxes and splice boxes that provide:

1. At-grade access to fiber optic cables housed within conduit systems used for Department ITS communications.

2. At-grade access to aid in the installation of fiber optic cable.

3. Protection for installed fiber optic cable.

4. Adequate space for cable storage and splice enclosures.

Ensure that pull boxes and splice boxes containing fiber optic cable do not contain power cables for ITS devices or other equipment.

783-3.2 Materials:

783-3.2.1 General Requirements: Ensure that all pull boxes and splice boxes are compatible with the fiber optic cable and are approved by the Engineer. Use pull boxes and splice boxes that are stackable and are structurally designed to meet or exceed ANSI Tier 15 loading requirements. Ensure that pull boxes and splice boxes:

1. Are rated as having a minimum compressive strength of 20,000 pounds per square inch, and are suitable for installation and use through a temperature range of -40° to 194°F.

2. Are rated as having a flexural strength of 6,000 pounds per square inch as required in the ASTM D790 standard.

3. Are rated as having a tensile strength of 800 pounds per square inch as required in the ASTM C496 standard.

4. Are rated to withstand a minimum vertical load of 20,000 pounds and a lateral load on the pull box wall of 1,200 pounds.

5. Provide accelerated service as required in Procedure E of the ASTM D756 standard.

6. Provide water absorption as required in Sections 5, 6.1, and 6.5 of the ASTM D570 standard.

7. Provide an impact resistance of 72 foot-pounds when using a "C" tup as required in the ASTM D2444 standard.

8. Include covers that provide skid resistance with a 0.5 friction coefficient as required in the ASTM C1028 standard.

9. Comply with the flammability testing requirements as detailed in the ASTM D635 standard.

10. Comply with the ASTM G53 requirements for UV exposure using a 340-nanometer ultraviolet A (UVA) bulb.

11. Provide chemical resistance as required in Section 7, Procedure 1, of the ASTM D543 standard.

Ensure that all pull box and splice box covers are a single piece and provide a 20,000-pound gross vehicle weight capacity with a live load rating of 20,000 pounds as required for ANSI Tier 15 loading conditions. Ensure that pull box and splice box covers comply with the ASTM C857 standard. Ensure that all pull box and splice box covers include bolt holes and stainless steel hex head bolts to secure the cover to the box. Ensure that bolts are 0.375 inch

in diameter with 16 unified coarse threads (UNC) for every 1 inch. Ensure that covers and bolts seat flush when installed on the box. Ensure that covers are equipped with a minimum 0.5 inch by 2 inch lifting slot with lift pin. Ensure that the pull box cover is constructed in compliance with the ASTM A48 Class 20 standard requirements.

Ensure that the pull box and cover complies with the structural capacity requirements of the FDOT State Materials Office.

783-3.2.2 Pull Box: Ensure that all pull boxes have an open bottom and are constructed of polymer concrete consisting of an aggregate matrix bound together with a polymer resin. Ensure that box construction includes internal reinforcement by means of steel or fiberglass, or a combination of the two. Ensure that the pull box is equipped with a nonskid cover secured by hex head bolts and any other miscellaneous hardware required for installation or as shown in the in the plans.

Ensure that the minimum pull box size is approximately 2 feet wide by 3 feet long by 3 feet deep, or as required in the plans. Ensure that the pull box is large enough to house fiber optic cable without subjecting the cable to a bend radius less than 14 times the diameter of the cable.

783-3.2.3 Splice Box: Use splice boxes at all fiber optic splice locations, as shown in the plans, and at other locations as approved by the Engineer. Ensure that all splice boxes have an open bottom and are constructed of polymer concrete consisting of an aggregate matrix bound together with a polymer resin. Ensure that box construction includes internal reinforcement by means of steel or fiberglass, or a combination of the two. Ensure that the splice box is equipped with a nonskid cover secured by hex head bolts; cable racks and hooks; pulling eyes; and any other miscellaneous hardware required for installation or as shown in the in the plans.

Ensure that the splice box size is approximately 2.5 feet wide by 5 feet long by 4 feet deep or as shown in the plans. Ensure that the splice box is large enough to house fiber optic cable without subjecting the cable to a bend radius less than 14 times the diameter of the cable.

783-3.2.4 Marking: Ensure that all pull box and splice box covers include the words “FDOT FIBER OPTIC CABLE” or text shown in plans permanently cast into their top surface. Ensure that the manufacturer’s logo is stamped on each pull box cover, along with the Department’s approval number. Ensure that markings are permanently affixed and clearly visible after installation.

783-3.3 Installation Requirements. Install all pull boxes and splice boxes according to the manufacturer’s recommendations; as shown in the plans; and in compliance with Section 635 and Design Standards Index No. 18204. Complete the installation of pull boxes, splice boxes, and conduit prior to cable installation. Provide all pull boxes and splice boxes a final finish grade elevation as shown in the plans. Excavate pull box and splice box installation sites to a depth of 1 foot below the bottom of the box, and replace with a 1 foot bed of pearock or crushed stone at the excavation base prior to installing the box.

Ensure that the box cover is flush with the existing finish grade after installation. Taper the finish grade contour to provide drainage from the splice box.

783-3.3.1 General Placement and Spacing: Place pull boxes and splice boxes as detailed in the plans, and at the following locations, unless directed otherwise by the Engineer:

1. At all major fiber optic cable and conduit junctions.

2. Approximately every 2,500 feet in rural areas with any continuous section of straight conduit if no fiber optic cable splice is required.
3. At a maximum of 1,760 feet in metropolitan areas.
4. At each end of a tunnel, and on each side of a river or lake crossing.
5. On each side of an aboveground conduit installation, such as an attachment to a bridge or wall.
6. At all 90-degree turns in the conduit system.

Ensure that all pull boxes and splice boxes are flush mounted at grade level, and are located near the base of a service pole or near the communication equipment cabinet serving the ITS field device to provide:

1. A transition point between the fiber optic conduits extending from the fiber backbone and the conduit feeding the communication cabinet.
2. An assist point for the installation of fiber optic drop cable.
3. Storage of slack fiber optic drop cable.

Do not place the pull boxes in roadways, driveways, parking areas, ditches, or public sidewalk curb ramps. Avoid placing pull boxes and splice boxes on steep slopes where the cover cannot be leveled within a tolerance of 1 inch of drop to 1 foot of grade or in low-lying locations with poor drainage.

783-3.3.2 Bonding and Grounding: Ensure that pull box and splice box installation includes a bonding and grounding system including a driven rod that is a minimum of 10 feet in length and 5/8" in diameter. Ensure that grounding rod is constructed of copper clad steel and complies with the UL 467 standard. Ensure that bonding conductors are bare solid AWG #6 copper wire as required in the ASTM B1 standard. Ensure that splice and termination components meet or exceed the UL 467 requirements, and are clearly marked with the manufacturer, catalog number, and conductor size. Ensure that grounding system complies with the NEC.

783-3.3.3 Material Removal and Restoration Specifications: Provide all material, equipment and labor for the removal of turf, earth, concrete/asphalt pavement or other site specific material to be removed for box installation. Ensure that original turf, earth, concrete/asphalt pavement or other site specific material is restored to its original condition once box installation is complete.

783-3.4 Testing and Certification:

783-3.4.1 Material Inspection: Inspect all pull boxes and splice boxes and approve prior to installation, and again prior to installation of the fiber optic cable.

783-3.4.2 Compaction and Density Testing: Perform compaction tests for each soil type encountered. Provide sufficient in-place density tests to confirm the adequacy and uniformity of the compaction procedures as required by the governing authorities or ROW owners, or as shown in the plans.

783-4 Guaranty Provisions.

Ensure that the fiber optic cable, the splice enclosures, termination points, conduit, locate system, pull boxes and splice boxes have a two-year manufacturer's warranty from the date of final acceptance by the Engineer in accordance with 5-11 of all the work to be performed under the Contract. If the manufacturer's warranties for the components are for a longer period, those longer period warranties will apply.

Ensure that the manufacturer's warranties on the fiber optic cable, the splice enclosures, termination points, conduit, locate system, pull boxes and splice boxes are fully transferable from

the Contractor to the Department. Ensure that these warranties require the manufacturer to furnish replacements for any part or equipment found to be defective during the warranty period at no cost to the Department within 10 calendar days of notification by the Department.

783-5 Method of Measurement.

783-5.1 Furnish and Install: Fiber optic cable shall be measured per foot of cable furnished, installed, warranted, tested and deemed fully operational.

Splices and terminations as shown in the plans shall be measured per each fiber connection furnished and installed.

The conduit and locate system shall be measured for payment per foot of conduit, buried cable warning tape and locate wire furnished, installed; designated with standard or electronic route markers (SRM or ERM), grounded, and protected. The conduit and locate system shall be warranted, made fully operational, and tested according to this specification.

The locate system electronic equipment (transmitters and receivers) shall be measured as each is delivered to the Engineer upon completion of the installation and acceptance of the work. Electronic box markers shall be measured as each is furnished, installed, and tested. The locate system electronic equipment shall be warranted, made fully operational, and tested according to this specification.

The fiber optic pull boxes and splice boxes shall be measured as each is furnished and installed, with grounding and associated hardware as detailed in the plans.

The Contract unit price, furnished and installed, will include furnishing, placement, and testing of all materials and equipment, and for all tools, labor, equipment, hardware, operational software package(s) and firmware(s), supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

783-5.2 Furnish: The Contract unit price per foot of fiber optic cable, conduit, or locate wire and route markers (SRM or ERM); each locate system transmitter, receiver, or electronic box marker; and each pull box or splice box, 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.

783-5.3 Install: The Contract unit price per foot of fiber optic cable, conduit, or locate wire and route markers (SRM or ERM); each electronic box marker; and each pull box or splice box, installed, will include placement and testing of all materials and equipment, and for all tools, labor, equipment, 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.

783-6 Basis of Payment.

Prices and payments will be full compensation for all work described herein or shown in the plans.

Payment will be made under:

Item No. 783- 1-	ITS Fiber Optic Cable—per foot.
Item No. 783- 2-	ITS Fiber Optic Connection—each.
Item No. 783- 3-	ITS Fiber Optic Connection Hardware.
Item No. 783- 4-	ITS Conduit—per foot.
Item No. 783- 5-	ITS Pull Box for Fiber Optic – each.
Item No. 783- 6-	ITS Splice Box for Fiber Optic – each.

Item No. 783- 9- ITS Locate System Electronic Equipment - each.

**784 INTELLIGENT TRANSPORTATION SYSTEMS – NETWORK DEVICES.
(REV 4-13-10) (FA 6-22-10) (1-11)**

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

**SECTION 784
INTELLIGENT TRANSPORTATION SYSTEMS
NETWORK DEVICES**

784-1 Managed Field Ethernet Switch.

784-1.1 Description. Furnish and install a hardened, device-level managed field Ethernet switch (MFES) for intelligent transportation system (ITS) projects. Ensure that the MFES provides wire-speed fast Ethernet connectivity at transmission rates of 100 megabits per second from the remote ITS device installation location to the ITS network trunk interconnection point. Use only equipment and components that meet the requirements of these minimum specifications, and are listed on the Department's Approved Product List (APL).

784-1.2 Materials:

784-1.2.1 General: Ensure that the ITS network administrator will be able to manage each MFES individually or as a group/cluster for switch configuration, performance monitoring, and troubleshooting. These specifications require additional minimum management intelligence (i.e., Layer 2+) typical of most current industrial Ethernet deployments. Ensure that the MFES includes Layer 2+ capability providing architecture standardization, open connectivity (i.e., interoperability), bandwidth management, rate limiting, security filtering, and general integration management of an advanced Ethernet switching architecture.

Ensure that the furnished MFES is fully compatible and interoperable with the ITS trunk Ethernet network interface, and that the MFES supports half and full duplex Ethernet communications.

Furnish an MFES that provides 99.999% error-free operation, and that complies with the Electronic Industries Alliance (EIA) Ethernet data communication requirements using single-mode fiber optic transmission medium and Category 5E copper transmission medium. Provide a switched Ethernet connection for each remote ITS field device.

Ensure that the MFES has a minimum mean time between failures (MTBF) of 10 years, or 87,600 hours, as calculated using the Bellcore/Telcordia SR-332 standard for reliability prediction.

784-1.2.2 Networking Standards: Ensure that the MFES complies with all applicable IEEE networking standards for Ethernet communications, including but not limited to:

1. IEEE 802.1D standard for media access control (MAC) bridges used with the Spanning Tree Protocol (STP).
2. IEEE 802.1Q standard for port-based virtual local area networks (VLANs).
3. IEEE 802.1P standard for Quality of Service (QoS).
4. IEEE 802.1w standard for MAC bridges used with the Rapid Spanning Tree Protocol (RSTP).

5. IEEE 802.1s standard for MAC bridges used with the Multiple Spanning Tree Protocol.
6. IEEE 802.3 standard for local area network (LAN) and metropolitan area network (MAN) access and physical layer specifications.
7. IEEE 802.3u supplement standard regarding 100 Base TX/100 Base FX.
8. IEEE 802.3x standard regarding flow control with full duplex operation.

784-1.2.3 Optical Ports: Ensure that all fiber optic link ports operate at 1,310 or 1,550 nanometers in single mode. Verify that the optical ports are Type ST, SC, LC, or FC only, as specified in the plans or by the Engineer. Do not use mechanical transfer registered jack (MTRJ) type connectors.

Provide an MFES having a minimum of two optical 100 Base FX ports capable of transmitting data at 100 megabits per second. Each optical port shall consist of a pair of fibers; one fiber will transmit (TX) data and one fiber will receive (RX) data. The optical ports shall have an optical power budget of at least 15 dB.

784-1.2.4 Copper Ports: Provide an MFES that includes a minimum of four copper ports. All copper ports shall be Type RJ-45 and shall auto-negotiate speed (i.e., 10/100 Base) and duplex (i.e., full or half). All 10/100 Base TX ports shall meet the specifications detailed in this section and shall be compliant with the IEEE 802.3 standard pinouts.

All Category 5E unshielded twisted pair/shielded twisted pair network cables shall be compliant with the EIA/TIA-568-A standard.

784-1.2.5 Management Capability: Ensure that the MFES supports all Layer 2 management features and certain Layer 3 features related to multicast data transmission and routing. These features shall include, but not be limited to:

1. An STP healing rate that meets or exceeds specifications published in the IEEE 802.1D standard.
2. An RSTP healing rate that meets or exceeds specifications published in the IEEE 802.1w standard.
3. An MFES that is a port-based VLAN and supports VLAN tagging that meets or exceeds specifications as published in the IEEE 802.1Q standard, and has a minimum 4-kilobit VLAN address table.
4. A forwarding/filtering rate that is a minimum of 14,880 packets per second for 10 megabits per second and 148,800 packets per second for 100 megabits per second.
5. A minimum 4-kilobit MAC address table.
6. Support of Traffic Class Expediting and Dynamic Multicast Filtering.
7. Support of, at a minimum, Version 2 of the Internet Group Management Protocol (IGMP).
8. Support of remote and local setup and management via telnet or secure Web-based GUI and command line interfaces.
9. Support of the Simple Network Management Protocol (SNMP). Verify that the MFES can be accessed using the resident EIA-232 management port, a telecommunication network, or the Trivial File Transfer Protocol (TFTP).
10. Port security through controlling access by the users. Ensure that the MFES has the capability to generate an alarm and shut down ports when an unauthorized user accesses the network.

11. Support of remote monitoring (RMON) of the Ethernet agent and the ability to be upgraded to switch monitoring (SMON), if necessary.

12. Support of the TFTP, the Network Time Protocol (NTP), or the Simple Network Time Protocol (SNTP). Ensure that the MFES supports port mirroring for troubleshooting purposes when combined with a network analyzer.

784-1.2.6 Mechanical Specifications: Ensure that all wiring complies with NEC requirements and standards. Furnish and identify all equipment and appurtenances by name, model number, serial number, technical support and warranty telephone numbers, and any other pertinent information required to facilitate equipment maintenance.

Ensure that every conductive contact surface or pin is gold-plated or made of a noncorrosive, non-rusting, conductive metal.

Ensure that all external screws, nuts, and locking washers are stainless steel in accordance with A601 of the MSTCSD. Do not use self-tapping screws.

All parts shall be made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal.

784-1.2.7 Electrical Specifications: Ensure that the MFES operates and power is supplied with 115 volts of alternating current (V_{AC}). Ensure that the MFES has a minimum operating input of 85 V_{AC} and a maximum operating input of 265 V_{AC} . If the device requires operating voltages other than 120 V_{AC} , supply the required voltage converter. Ensure that the maximum power consumption does not exceed 50 watts.

Ensure that the MFES has diagnostic light emitting diodes (LEDs), including link, TX, RX, speed (for Category 5E ports only), and power LEDs.

784-1.2.8 Environmental Specifications: Ensure that the MFES performs all of the required functions during and after being subjected to an ambient operating temperature range of -30 degrees ($^{\circ}$) to 165 $^{\circ}$ Fahrenheit (F) as defined in the environmental requirements section of the NEMA TS 2 standard, with a noncondensing humidity of 0 to 95%.

Verify that the MFES manufacturer certifies their device has successfully completed environmental testing as defined in the environmental requirements section of the NEMA TS 2 standard. Verify that vibration and shock resistance meet the requirements of Sections 2.1.9 and 2.1.10, respectively, of the NEMA TS 2 standard.

Ensure that the MFES is protected from rain, dust, corrosive elements, and typical conditions found in a roadside environment.

784-1.3 Installation Requirements: Mount the MFES inside a field site cabinet. Ensure that the MFES is resistant to all electromagnetic interference (EMI). Ensure that the MFES is mounted securely in 19 inches EIA racking and is fully accessible by field technicians.

Due to the nature of the equipment, complexity of the electronics, and harsh environmental conditions at installation locations, use MFES units that can be serviced or replaced immediately when defective or damaged units must be removed and replaced. The Department shall return damaged units to the manufacturer for warranty repair or replacement.

784-1.4 Testing:

784-1.4.1 General: Subject the MFES to field acceptance tests (FATs). Develop and submit a test plan for FATs to the Engineer for consideration and approval. The Engineer reserves the right to witness all FATs. Complete the tests within five calendar days.

784-1.4.2 Field Testing: Once the MFES has been installed, conduct local FATs at the MFES field site according to the submitted test plan. Perform the following:

1. Verify that physical construction has been completed as detailed in the plans.
2. Inspect the quality and tightness of ground and surge protector connections.
3. Verify proper voltages for all power supplies and related power circuits.
4. Connect devices to the power sources.
5. Verify all connections, including correct installation of communication and power cables.
6. Verify configuration of the MFES Internet Protocol (IP) addresses and subnetwork mask.
7. Verify the network connection to the MFES through ping and telnet sessions from a remote personal computer (PC).
8. Perform testing on multicast routing functionality.

784-2 Device Server.

784-2.1 Description. Furnish and install a device server as shown in the plans. Provide a device server that includes a central processing unit (CPU), realtime operating system (RTOS), Transmission Control Protocol/Internet Protocol (TCP/IP) stack, and Ethernet and serial data ports to allow connection of serial devices with EIA-232, EIA-422, and EIA-485 connections to an Ethernet network. Ensure that the device server (also referred to as a terminal server) encapsulates serial data in network packets and transports them across IP networks. Use only equipment and components that meet the requirements of these minimum specifications, and are listed on the Department's Approved Product List (APL).

784-2.2 Materials:

784-2.2.1 General: Ensure that the device server provides a TCP/IP interface to one or more field devices using EIA-232/422/485 standard connections. Ensure that the device server supports TCP/IP, User Datagram Protocol (UDP)/IP, Dynamic Host Configuration Protocol (DHCP), Address Resolution Protocol (ARP), Internet Control Message Protocol (ICMP), Simple Network Management Protocol (SNMP), Hypertext Transfer Protocol (HTTP), and telnet.

Ensure that the device server provides 99.999% error-free operation and EIA-compatible Ethernet data communication by way of a Category 5E copper or fiber optic transmission medium, as shown in the plans.

Ensure that the device server is resistant to all electromagnetic interference.

Use a device server having an encryption feature that provides data security and prevents interception or "sniffing" of transmitted information by unauthorized parties. Data security shall comply with Version 2 of the Secure Shell Protocol (SSHv2), or the NIST requirements as defined in the Federal Information Processing Standard (FIPS) Publication (PUB)-197 for the Advanced Encryption Standard (AES).

Ensure that the device server has a minimum mean time between failures (MTBF) of 10 years, or 87,600 hours.

784-2.2.2 Serial Interface: Ensure that the device server provides a minimum of one serial data interface and connector as specified in the plans that conforms to EIA-232/422/485 standards. Ensure that the serial interface supports 2-wire and 4-wire EIA-485 connections. Ensure that the serial port(s) support data rates up to 230 kbps; error detection procedures utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2).

Ensure that the device server provides flow control (request to send [RTS]/clear to send [CTS] and transmit on/transmit off [XON/XOFF]), as well as allow control of the data terminal ready (DTR), data carrier detect (DCD), data set ready (DSR), CTS, and RTS signals. Ensure that the device server supports RTS toggle for half-duplex emulation.

784-2.2.3 Network Interface: Ensure that the device server includes a minimum of one Ethernet port, which must provide a 10/100 Base-TX or a 10/100 Base-FX connection as specified in the plans. Verify that all Category 5E, unshielded twisted pair/shielded twisted pair network cables and connectors comply with the EIA and Telecommunications Industry Association (TIA) requirements as detailed in the EIA/TIA-568-A standard. Verify that all copper-based network interface ports utilize registered jack (RJ)-45 connectors. Provide fiber optic cable and connectors for fiber optic cable compliant with Section 783.

784-2.2.4 Configuration and Management: Provide a device server that supports local and remote configuration and management, which must include access to all user-programmable features, including but not limited to addressing, port configuration, device monitoring, diagnostic utilities, and security functions. Ensure that the device server supports configuration and management via serial login, SNMP, telnet login, and browser-based interface.

784-2.2.5 Mechanical Specifications: Ensure that all parts are made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. Ensure that all exposed fasteners are stainless steel.

Ensure that the dimensions of the device server accommodate the unit's installation in a control cabinet as specified in the plans.

784-2.2.6 Electrical Specifications: Verify that all wiring meets applicable NEC requirements and that the device server operates using a nominal input voltage of 120 volts alternating current (V_{AC}). The input voltage range shall be 89 to 135 V_{AC} . If the device requires nominal input voltage of less than 120 V_{AC} , furnish the appropriate voltage converter. Verify that the maximum power consumption does not exceed 12 watts.

Ensure that the device server includes diagnostic status indicators in the form of light emitting diodes (LEDs) that provide link, transmit (TX), receive (RX), and power status information.

784-2.2.7 Environmental Specifications: Verify that the device server meets all specifications and is capable of performing all of its functions during and after being subjected to an ambient operating temperature range of -31 degrees (°) to 165° Fahrenheit (F), as required in the NEMA TS 2 standard, with a noncondensing relative humidity of 0% to 95%.

Install the device server in an enclosure that provides protection from moisture and airborne contaminants, blowing rain, wind, blowing dust, temperature, humidity, roadside pollutants, vandalism, pests, and theft of equipment.

Verify that the device server meets the vibration and shock resistance specifications as provided in Section 2.1.9 and 2.1.10, respectively, of the NEMA TS 2 standard.

784-2.3 Installation Requirements: Install all equipment and software according to the manufacturer's recommendations or as directed by the Engineer. Mount the device server securely in a location in the equipment cabinet that allows the unit to be fully accessible by field technicians.

Due to the nature of the equipment, complexity of the electronics, and harsh environmental conditions at installation locations, use device servers that can be replaced immediately when defective or damaged units must be removed and replaced. The Department shall return damaged units to the manufacturer for warranty repair or replacement.

784-2.4 Testing:

784-2.4.1 General: Subject the Device Server to field acceptance tests (FATs). Develop and submit a test plan for FATs to the Engineer for consideration and approval. The Engineer reserves the right to witness all FATs. Complete the tests within five calendar days.

784-2.4.2 Field Testing: Perform local field operational tests at device server field sites according to the test procedures stated herein.

1. Verify that physical construction has been completed as specified in the plans.
2. Verify the quality and tightness of ground and surge protector connections.
3. Verify proper voltages for all power supplies and related power circuits.
4. Connect devices to the power sources.
5. Verify all connections, including correct installation of communication and power cables.
6. Verify the network connection to the device server through ping and telnet session from a remote personal computer (PC).
7. Verify serial data transmission through the device server.

784-3 Digital Video Encoder and Decoder.

784-3.1 Description: Furnish and install digital video encoder (DVE) and digital video decoder (DVD) hardware and software to create a video-over-IP network system, as shown in the plans, and as directed by the Engineer. Use only equipment and components that meet the requirements of these minimum specifications, and are listed on the Department's Approved Product List (APL).

784-3.2 Materials:

784-3.2.1 General: Use DVEs and DVDs that are specialized network-based hardware devices and software which allow video and data signals to be encapsulated and transmitted across IP networks. Ensure that the video and data packets produced by the DVE and placed onto the network allow reconstruction of digital video signals by hardware-based and software-based DVDs that are also attached to the network.

Ensure that the complete video and data transmission system, defined as the combination of DVE and DVD hardware together with the existing or planned network infrastructure, simultaneously transports video and data from multiple remote field locations to multiple monitoring locations for roadway surveillance and traffic management. Ensure that end-to-end transmission of 30 frames-per-second (fps) D1 resolution video and data signals from DVE inputs to DVD outputs occurs within 250 milliseconds.

784-3.2.2 Software: Provide a software decoding and control package that allows the viewing of any video source connected to the network through a DVE, and which allows the pan-tilt-zoom (PTZ) control of any PTZ camera on the network, the discovery of DVE and DVD devices on the network, and the control and adjustment of programmable parameters in the DVE and DVD equipment, including the network addresses of these devices, at no additional cost.

Provide all setup, control programs, and diagnostic software related to the DVE or DVD. Provide all equipment licenses, where required for any software or hardware in the system. Ensure that the DVE and DVD are compatible with the Department's SunGuide[®] Software System.

784-3.2.3 MPEG-2 Format: Furnish DVE and DVD components that utilize the Moving Picture Experts Group's MPEG-2 video compression technology in accordance with the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) requirements detailed in the ISO/IEC 13818 standard. Ensure that the DVE and DVD are capable of unicast and multicast operation, and that they support the Session Announcement Protocol (SAP) as recommended by the Internet Engineering Task Force (IETF) RFC 2974, and Differentiated Services/Quality of Service (DiffServ/QoS) software components. Ensure that the DVE provides 99.999% error-free operation. Ensure MPEG-2 DVE and DVD equipment supports programmable bit rates from 1Mbps to 8 Mbps. Ensure that MPEG-2 equipment supports fixed bit rate mode.

784-3.2.4 H.264 Format: Furnish DVE and DVD components that utilize video compression technology in accordance with the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) requirements detailed in the ISO/IEC 14496-10:2009 standard. Ensure that the DVE and DVD are capable of unicast and multicast operation, and that they support the Session Announcement Protocol (SAP) as recommended by the Internet Engineering Task Force (IETF) RFC 2974, Real Time Streaming Protocol (RTSP), and Differentiated Services/Quality of Service (DiffServ/QoS) software components. Ensure that the DVE provides 99.999% error-free operation. Ensure H.264 DVE and DVD equipment supports programmable bit rates from 64kbps to 8 Mbps. Ensure that H.264 equipment supports fixed bit rate mode.

784-3.2.5 Digital Video Encoder: Provide a DVE that is a hardware-based network device able to accept a minimum of one analog National Television System Committee (NTSC) video input and digitize it for transport across IP networks. Use a DVE that provides a minimum of one serial data interface for transmission of command and control data to other devices (typically camera PTZ commands), as well as console and configuration functions. Provide compatible decoder software along with the DVE at no additional cost, as shown in the plans, or as directed by the Engineer.

784-3.2.6 Digital Video Decoder: Provide a DVD that is either a hardware-based network device or a software application that resides on a workstation personal computer (PC).

784-3.2.6.1 Hardware-based Decoder: Provide a hardware-based decoder that has a minimum of one analog NTSC video output and decodes digital video and data streams present on an IP network into analog formats for interconnection with other devices. Use a DVD that has a minimum of one serial data interface for transmission of command and control data to other devices, as well as console and configuration functions. Use a DVD that includes an Ethernet interface for connection to IP networks.

784-3.2.6.2 Software-based Decoder: Provide a software-based DVD that is compatible with the Department's SunGuide[®] software. Ensure that any software-based decoder applications do not interfere with SunGuide[®] software operating when installed and used together on a shared hardware platform. Ensure that the software application provides PC desktop display of IP network video streams and control of any PTZ camera connected to the network. The decoder and PTZ functions may be achieved through the use of discrete software applications. Ensure that the software-based decoder offers an open Application Programming Interface (API) and software development kit available to the Department at no cost for integration with third party software and systems.

784-3.2.7 Interoperability: Provide DVE and DVD devices and software that are interoperable and interchangeable with DVE and DVD devices and software from other manufacturers. Ensure that the DVE is compatible and fully interoperable with software and hardware DVDs from the DVE manufacturer, as well as a minimum of two software and hardware DVDs from other manufacturers. Ensure that the DVD is compatible and fully interoperable with DVEs from the DVD manufacturer, as well as a minimum of two other DVEs from other manufacturers.

784-3.2.8 Video Specifications: Ensure that any video input utilizes a BNC connector and delivers 1 volt peak-to-peak (Vp-p) NTSC composite video signals for encoding. Ensure that the DVE and DVD operate with both color and monochrome video, and that they allow the user to select and adjust video resolution. Ensure that the DVE and DVD support resolutions that include, but are not limited to, those defined in Table 3.1. Ensure that the DVE and DVD are capable of delivering color and monochrome video at 30 fps regardless of resolution.

Table 3.1 – Resolution Requirements	
Format	Resolutions
MPEG-2	352 x 240, 352 x 480, 720 x 480
H.264	176 x 120, 352 x 240, 720 x 480
Note: The resolutions attained depend on the data transmission rate.	

784-3.2.9 Serial Interface: Ensure that hardware-based DVEs and DVDs provide a minimum of one serial data interface and connector that conforms to EIA-232/422/485 standards. Ensure that the serial interface supports 2-wire and 4-wire EIA-485 connections. Ensure that the serial port(s) support data rates up to 230 kbps; error detection procedures utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2).

Ensure that the serial interface provides flow control (request to send [RTS]/clear to send [CTS] and transmit on/transmit off [XON/XOFF]), as well as allow control of the data terminal ready (DTR), data carrier detect (DCD), data set ready (DSR), CTS, and RTS signals. Ensure that the serial interface supports RTS toggle for half-duplex emulation. Ensure that hardware-based DVEs and DVDs provide a TCP/IP interface to their serial port using a network socket connection with configurable IP address and port number. Serial interface ports may utilize RJ-45 connectors, D-sub connectors, or screw terminals.

784-3.2.10 Network Interface: Ensure that the DVE/DVD local area network (LAN) connection supports the requirements detailed in the IEEE 802.3 standard for 10/100 Ethernet connections. Provide a DVE having a minimum of one Ethernet port, which shall be a 10/100 Base-TX connection or a 100 Base-FX ST, SC, LC or FC interface capable of multi-hop configuration using two sets of optical ports (e.g., Tx¹, Rx¹, Tx², Rx²). Ensure that the connector complies with applicable EIA and TIA requirements. Provide copper-based network interface ports that utilize RJ-45 connectors. Ensure that all fiber-based ports are single mode and provide a link budget of 30 dB or greater.

Ensure that all Category 5E, unshielded twisted pair/shielded twisted pair network cables are compliant with the EIA/TIA-568-A standard. Ensure that the network

communication conforms to User Datagram Protocol (UDP), Version 4 of the Internet Protocol (IP) and Version 2 of the Internet Group Multicast Protocol (IGMP).

784-3.2.11 Front Panel Status Indicators: Provide DVEs and DVDs that have light-emitting diode (LED) displays, liquid crystal displays (LCDs), or similar illuminated displays to indicate status for power, data activity, link status, and video transmission.

784-3.2.12 Configuration and Management: Provide DVEs and DVDs that support local and remote configuration and management. Configuration and management functions shall include access to all user-programmable features, including but not limited to addressing, serial port configuration, video settings, device monitoring, and security functions. Ensure that the DVE and DVD support configuration and management via serial login, telnet login, and Simple Network Management Protocol (SNMP).

784-3.2.13 Electrical Specifications: Ensure that all wiring meets NEC requirements and standards. Provide equipment that operates on a nominal voltage of 120 volts alternating current (V_{AC}). The equipment shall operate within a voltage range of 89 V_{AC} to 135 V_{AC} . The operating frequency range for power shall be 60 hertz ± 3 Hz. If the device requires operating voltages of less than 120 V_{AC} , supply the appropriate voltage converter.

784-3.2.14 Environmental Specifications: Except as may be stated otherwise in the plans, provide DVEs and hardware DVDs that meet all specifications during and after being subjected to an ambient operating temperature range of -30 degrees ($^{\circ}$) to 165 $^{\circ}$ Fahrenheit (F) as defined in the environmental requirements section of the NEMA TS 2 standard, with a maximum non-condensing relative humidity of 95%.

Ensure that cabinets housing system components comply with the environmental requirements detailed in the NEMA TS 2 standard. House the DVE in a field cabinet with protection from moisture and airborne contaminants, blowing rain, wind, blowing sand, blowing dust, humidity, roadside pollutants, vandalism, and theft. Ensure that the DVE is resistant to vibration and shock, and conforms to Sections 2.1.9 and 2.1.10, respectively, of the NEMA TS 2 standard.

Ensure that a hardware DVD installed in a climate-controlled environment, such as a TMC computer room, meets all specifications during and after being subjected to an ambient operating temperature range of 32 degrees ($^{\circ}$) to 113 $^{\circ}$ Fahrenheit (F).

784-3.3 Installation Requirements: Ensure that the DVE is shelf- and/or rack-mountable, and designed for use in roadside control cabinets without climate control. Ensure that the dimensions of the DVE allow installation in a control cabinet as specified in the plans. Ensure that front panel status indicators remain unobstructed and visible. Use only stainless steel external screws, nuts, and locking washers. All parts shall be made of corrosion-resistant materials, such as plastic, stainless steel, anodized or painted aluminum, brass, or gold-plated metal.

Because a DVD may be hardware or software-based, these mechanical specifications apply only to hardware-based DVDs. Field-hardened DVDs shall be shelf- and rack-mountable, and designed for use in roadside control cabinets without climate control. The dimensions of the DVD shall allow installation in a control cabinet as specified in the plans. All external screws, nuts, and locking washers shall be stainless steel. All parts shall be made of corrosion-resistant materials, such as plastic, stainless steel, anodized or painted aluminum, brass, or gold-plated metal.

Non-hardened DVDs shall be shelf- and rack-mountable, and designed for use in a climate-controlled TMC. The rack-mounted DVD shall be designed to fit in a standard EIA

19 inch rack and shall not require shielding from other electronic devices, such as power supplies and other communication equipment. The dimensions of the DVD shall allow installation as specified in the plans.

Due to the nature of the equipment, complexity of the electronics, and harsh environmental conditions at installation locations, use DVEs and DVDs that can be replaced immediately when defective or damaged units must be removed and replaced. The Department shall return damaged units to the manufacturer for warranty repair or replacement.

784-3.4 Testing:

784-3.4.1 General: Subject the DVEs and DVDs to field acceptance tests (FATs). Develop and submit a test plan for FATs to the Engineer for consideration and approval. The Engineer reserves the right to witness all FATs. Complete the tests within five calendar days.

784-3.4.2 Field Testing: Perform local field operational tests at the device field site and end-to-end video streaming tests as required by the Engineer in order to demonstrate compliance with Department specifications. Testing will include, but not be limited to, the following:

1. Verify that physical construction has been completed as detailed in the plans.
2. Inspect the quality and tightness of ground and surge protector connections.
3. Verify proper voltages for all power supplies and related power circuits.
4. Connect devices to the power sources.
5. Verify all connections, including correct installation of communication and power cables.
6. Verify video image is present and free from oversaturation and any other image defect in both color and monochrome mode.
7. Verify network connection to the DVE and DVD through ping and telnet session from a remote PC.
8. Verify serial data transmission through the DVE and DVD serial ports.
9. Verify support of unicast, multicast, SAP, and QoS.

784-4 Guaranty Provisions.

784-4.1 General: Ensure that the manufacturers' warranties for the MFES, device server, DVE and DVD are fully transferable from the Contractor to the Department. Ensure that these warranties require the manufacturer to furnish replacements for any part or equipment found to be defective during the warranty period at no cost to the Department within 10 calendar days of notification by the Department.

If the manufacturer's warranties noted below are for a longer period, those longer period warranties will apply.

784-4.2 MFES: Provide an MFES having a manufacturer's warranty for equipment and parts furnished to be free from defects in fabrication, assembly, and materials for five years from the date of final acceptance by the Engineer in accordance with 5-11 of all work to be performed under the Contract.

Ensure that the MFES includes technical support for both the product hardware and its software for three years from the date of final acceptance.

784-4.3 Device Server: Provide a device server having a manufacturer's warranty for equipment and parts furnished to be free from defects in fabrication, assembly, and materials for

five years from the date of final acceptance by the Engineer in accordance with 5-11 of all work to be performed under the Contract.

784-4.4 Digital Video Encoder and Decoder: Provide a DVE or DVD having a manufacturer's warranty for equipment and parts furnished to be free from defects in fabrication, assembly, and materials for two years from the date of final acceptance by the Engineer in accordance with 5-11 of all work to be performed under the Contract.

784-5 Method of Measurement.

784-5.1 General: The MFES, device server, DVE and DVD shall be measured for payment in accordance with the following tasks.

Provide software-based decoders at no additional cost when furnished in conjunction with DVEs, as shown in the plans or as directed by the Engineer.

A software-based DVD provided individually shall be paid under the pay item below.

784-5.2 Furnish and Install: The Contract unit price for each MFES, device server, DVE or DVD, furnished and installed, will include furnishing, 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.

784-5.3 Furnish: The Contract unit price per each MFES, device server, DVE or DVD, 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.

784-5.4 Install: The Contract unit price per each MFES, device server, DVE or DVD, 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.

784-6 Basis of Payment.

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

Payment will be made under:

Item No. 784-1-	ITS Managed Field Ethernet Switch—each.
Item No. 784-2-	ITS Device Server—each.
Item No. 784-3-	ITS Digital Video Encoder with Software Decoder—each.
Item No. 784-4-	ITS Digital Video Decoder—each.

901 COARSE AGGREGATE.

(REV 12-15-09) (FA 12-21-09) (7-10)

SUBARTICLE 901-4.1 (Pages 815-817) is deleted and the following substituted:

901-1.4 Gradation: Coarse aggregates shall conform to the gradation requirements of Table 1, when the stone size is specified. However, Table 1 is waived for those aggregates intended for usage in bituminous mixtures, provided the material is graded on sieves specified in

production requirements contained in 6-3.3, and meets uniformity and bituminous design requirements.

TABLE 1 Standard Sizes of Coarse Aggregate								
Amounts Finer than Each Laboratory Sieve (Square Openings), weight percent								
Size No.	Nominal Size Square Openings	4 inches	3 1/2 inches	3 inches	2 1/2 inches	2 inches	1 1/2 inches	1 inch
1	3 1/2 to 1 1/2 inches	100	90 to 100	-	25 to 60	-	0 to 15	-
2	2 1/2 inches to 1 1/2 inches	-	-	100	90 to 100	35 to 70	0 to 15	-
24	2 1/2 inches to 3/4 inch	-	-	100	90 to 100	-	25 to 60	-
3	2 inches to 1 inch	-	-	-	100	90 to 100	35 to 70	0 to 15
357	2 inches to No. 4	-	-	-	100	95 to 100	-	35 to 70
4	1 1/2 inches to 3/4 inch	-	-	-	-	100	90 to 100	20 to 55
467	1 1/2 inches to No. 4	-	-	-	-	100	95 to 100	-
5	1 inch to 1/2 inch	-	-	-	-	-	100	90 to 100
56	1 inch to 3/8 inch	-	-	-	-	-	100	90 to 100
57	1 inch to No. 4	-	-	-	-	-	100	95 to 100
6	3/4 inch to 3/8 inch	-	-	-	-	-	-	100
67	3/4 inch to No. 4	-	-	-	-	-	-	100
68	3/4 inch to No. 8	-	-	-	-	-	-	-
7	1/2 inch to No. 4	-	-	-	-	-	-	-
78	1/2 inch to No. 8	-	-	-	-	-	-	-
8	3/8 inch to No. 8	-	-	-	-	-	-	-
89	3/8 inch to No. 16	-	-	-	-	-	-	-
9	No. 4 to No. 16	-	-	-	-	-	-	-
10	No. 4 to 0	-	-	-	-	-	-	-

TABLE 1 (Continued) Standard Sizes of Coarse Aggregate								
Amounts Finer than Each Laboratory Sieve (Square Openings), weight percent								

Size No.	Nominal Size Square Openings	3/4 inch	1/2 inch	3/8 inch	No. 4	No. 8	No. 16	No. 50
1	3 1/2 inches to 1 1/2 inches	0 to 5						
2	2 1/2 inches to 1 1/2 inches	0 to 5						
24	2 1/2 inches to 3/4 inch	0 to 10	0 to 5					
3	2 inches to 1 inch	-	0 to 5					
357	2 inches to No. 4	-	10 to 30	-	0 to 5			
4	1 1/2 inches to 3/4 inch	0 to 15	-	0 to 5				
467	1 1/2 inches to No. 4	35 to 70	-	10 to 30	0 to 5			
5	1 inch to 1/2 inch	20 to 55	0 to 10	0 to 5				
56	1 inch to 3/8 inch	40 to 85	10 to 40	0 to 15	0 to 5			
57	1 inch to No. 4	-	25 to 60	-	0 to 10	0 to 5		
6	3/4 inch to 3/8 inch	90 to 100	20 to 55	0 to 15	0 to 5			
67	3/4 inch to No. 4	90 to 100	-	20 to 55	0 to 10	0 to 5		
68	3/4 inch to No. 8	90 to 100	-	30 to 65	5 to 25	0 to 10	0 to 5	
7	1/2 inch to No. 4	100	90 to 100	40 to 70	0 to 15	0 to 5		
78	1/2 inch to No. 8	100	90 to 100	40 to 75	5 to 25	0 to 10	0 to 5	
8	3/8 inch to No. 8	-	100	85 to 100	10 to 30	0 to 10	0 to 5	
89	3/8 inch to No. 16	-	100	90 to 100	20 to 55	5 to 30	0 to 10	0 to 5
9	No. 4 to No. 16	-	-	100	85 to 100	10 to 40	0 to 10	0 to 5
10	No. 4 to 0	-	-	100	85 to 100	-	-	-

The gradations in Table 1 represent the extreme limits for the various sizes indicated which will be used in determining the suitability for use of coarse aggregate from all sources of supply. For any grade from any one source, the gradation shall be held reasonably uniform and not subject to the extreme percentages of gradation specified above.

916 BITUMINOUS MATERIALS.
(REV 8-4-10) (FA 8-16-10) (1-11)

SECTION 916-1 (Pages 828-842) is deleted and the following substituted:

SECTION 916
BITUMINOUS MATERIALS

916-1 Superpave PG Asphalt Binder:

916-1.1 Requirements: Superpave Performance Graded (PG) asphalt binders, identified as PG 64-22, PG 67-22, and PG 76-22, shall meet the requirements of 916-1.2, AASHTO M 320 Table 1 and the following additional requirements:

1. The mass loss AASHTO T 240 shall be a maximum of 0.5% for all grades.
2. The intermediate test temperature at 10 rad/s. for the Dynamic Shear Rheometer test AASHTO T 315 shall be 25°C for all grades.
3. An additional high temperature grade of PG 67 is added for which the high test temperature at 10 rad/sec for the Dynamic Shear Rheometer test AASHTO T 315 shall be 67°C.
4. All PG asphalt binders having a high temperature designation of PG 67 or lower shall be prepared without modification.
5. All PG asphalt binders having a high temperature designation higher than PG 67 shall be produced with a styrene-butadiene-styrene (SBS) or styrene-butadiene (SB) elastomeric polymer modifier and resultant binder shall meet all requirements of this Specification; in addition the phase angle at 76°C (AASHTO T 315) shall be a maximum of 75 degrees.
6. The maximum viscosity AASHTO T 202 shall be 2400 poises for PG 64-22 and 3600 poises for PG 67-22.

All hot mix asphalt (except hot mix asphalt containing 20% RAP or greater) shall contain Superpave PG asphalt binder grade PG 67-22 unless otherwise specified in the plans and/or Specifications for the hot mix asphalt product.

For all PG binder used in all hot mix asphalt, silicone may be added to the PG binder at the rate of 25 cubic centimeters of silicone mixed to each 5,000 gallons of PG binder. If a dispersing fluid is used in conjunction with the silicone, the resultant mixture containing the full 25 cubic centimeters of silicone shall be added in accordance with the manufacturer's recommendation. The blending of the silicone with the PG binder shall be done by the supplier prior to the shipment.

All PG binder and asphalt rubber binder for Friction Course mixes and for other hot mix asphalt products containing RAP shall contain 0.5% heat stable anti-strip additive by weight of PG binder unless specifications for the hot mix asphalt product requires testing by FM 1-T 283 and the test results indicate it is not required, or the mixture contains hydrated lime. Where FM 1-T 283 indicates an anti-strip additive is required, it shall be from 0.25 to 0.75%. The anti-strip additive shall meet the requirements of 916-5. The anti-strip additive shall be introduced into the PG binder by the supplier during loading.

Where PG binder is used in mixes containing reclaimed asphalt pavement (RAP), the requirements of 334-2.3.4 must also be met.

916-1.2 Qualified Products List: The Superpave PG asphalt binders supplied under this Specification shall be one of the products included on the Qualified Products List as specified in 6-1. Manufacturers seeking evaluation of their product shall submit an application in accordance

with Section 6 and include a report of test results from an independent laboratory confirming the material meets the requirements of this section. Any marked variation from the original test values for a material below the established limits or evidence of inadequate quality control or field performance of a material will be considered to be sufficient evidence that the properties of the material have changed, and the material will be removed from the Qualified Products List.

For each binder grade, the supplier may be required to submit to the State Materials Office a split sample of material representative of test results submitted with the Product Evaluation Application. In addition, for modified binders, the original PG binder grade, the modifier product designation, and amount added shall be indicated on the Product Evaluation Application and in the Quality Control Program below. Suppliers shall not ship any PG binder until notified that the product is on the Qualified Products List and an approved Quality Control Program meeting the requirements of 916-1.3 has been implemented.

916-1.3 Quality Control Program: The supplier of Superpave PG asphalt binder shall at a minimum have a Quality Control Program meeting the requirements of this Specification which is based on AASHTO R 26. The Quality Control Program shall be submitted in electronic format to the State Materials Office for approval.

The requirements for the Quality Control program apply to the supply location of PG binders for the use on Florida Department of Transportation projects. The supply location of PG binder may represent refinery production, terminal distribution, blending, processing, and/or modification location. Rack blending (blending from two tank sources) will be permitted to meet the requirements for a PG asphalt binder product. Any special handling requirements such as rack blending and manufacture of polymer modified asphalt shall be described in the Quality Control program. The requirements of these Specifications for a Quality Control Program do not apply to Recycle Agents at this time.

916-1.3.1 Identification of Personnel and Supply Locations: The supplier's primary and secondary representatives responsible for Quality Control shall be identified by name, title, address, telephone, fax and e-mail address. At least one of the representatives shall be located at the supply location. The supply locations shall be identified by name, address and telephone.

916-1.3.2 Specification Compliance and Quality Control Testing: Specification Compliance Testing shall consist of complete testing of each PG binder shipped in accordance with AASHTO M 320 and 916-1.1 of these Specifications. Results of Specification Compliance Testing shall be available to the supplier within five working days of sampling. Specification Compliance Testing shall be conducted by a testing laboratory that participates at least annually in the AASHTO Materials Reference Laboratory (AMRL) Proficiency Sample Program for both Performance Graded Asphalt Binder and Viscosity Graded Asphalt Cement. The primary testing lab and any other labs to be used for Specification Compliance Testing shall be identified in the suppliers Quality Control Program. The results from each AMRL Proficiency Sample for each testing laboratory shall be forwarded by the supplier for each supply location in electronic format to the State Materials Office. Acceptable performance in the AMRL Proficiency Sample Program shall be a minimum of 3 for each test. A rating of less than 3 shall require identification of appropriate action on the part of the supplier and be acceptable to the State Materials Engineer.

Quality Control testing as a minimum shall consist of testing a representative sample of each PG binder shipped by the supplier in accordance with either:

(1) AASHTO T 202 Standard Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer or

(2) AASHTO T 315 Test Method for Determining Rheological Properties of Asphalt Binder using a Dynamic Shear Rheometer (DSR).

Results of Quality Control Testing shall be available to the supplier within five hours of sampling. A Quality Control test result outside the specification limits will require immediate sampling and testing for Specification Compliance and appropriate action taken. The Quality Control testing and location where the test will be done shall be identified in the suppliers Quality Control Program.

916-1.3.3 Frequency of Sampling and Testing: Sampling of PG binders shall be done in accordance with AASHTO T 40. Initial Specification Compliance test results shall be required for each PG binder grade for each new LOT of material which will be further subjected to Quality Control Testing in accordance with 916-1.3.2. A new LOT will occur when the material in a tank changes and the Specification Compliance Test may no longer be representative of the material in the tank. This may be due to an incoming bulk shipment of material, change in refinery run, the manufacture of a product, or a blend of material in a tank. Additional testing is as follows:

(1) Any PG binder shipped to a Department project during any one calendar month shall be tested at least once during that month for Specification Compliance in accordance with 916-1.3.2.

(2) When being shipped to Department projects, samples shall be obtained by the supplier and tested for Quality Control testing in accordance with 916-1.3.2. A single one quart representative sample of each PG binder shall be obtained and tested by the supplier each calendar week; for each rack blended PG binder, additional representative samples shall be obtained daily. Each Quality Control sample and additional daily rack blended samples shall be adequately identified and retained not less than eight weeks at the supply location. Any PG binder not shipped to Department projects is not required to be sampled or tested.

(3) Split samples of any PG binder will be provided when requested by a representative of the Department. In this situation three representative one quart samples will be obtained by the supplier under the direction of the Department. One sample will be submitted to the State Materials Office, one will be tested by the supplier for Specification Compliance and one will be tested by the supplier for Quality Control. The method of obtaining the three representative one quart samples is to obtain a single gallon sample, which is then stirred and poured into three one quart cans. When split samples are requested by the Department, the results from both parties will be made available within ten working days.

(4) For each rack blended PG binder, identify minimum daily Process Control Testing in the QC Plan.

916-1.3.4 Reporting: A monthly report by the supplier containing Specification Compliance and Quality Control Test results for each PG binder LOT shall be submitted by the supplier in electronic format using the form provided by the Department to the State Materials Office within seven days following the end of the calendar month. Test results for split samples shall also be included. Process Control Test results shall not be included. Copies of these monthly reports and supporting test reports shall be available at the supply location for a minimum of three years.

The report shall consist of the Specification compliance testing and Quality Control Testing of the following as applicable by these Specifications.

SUPERPAVE PG ASPHALT BINDER		
Test and Method	Conditions	Specification Minimum/Maximum Value
Original Binder		
Superpave PG Asphalt Binder Grade		Report
Qualified Products List Number		Report
Polymer Modifier Type	(PG 76-22 Only)	Report
Solubility, AASHTO T 44	in Trichloroethylene	Minimum 99.0%
Flash Point, AASHTO T 48	COC	Minimum 450°F
Rotational Viscosity, AASHTO T 316	275°F	Maximum 3 Pa-s
Absolute Viscosity, AASHTO T 202	140°F	Max. 2400 P (PG 64-22) Max. 3600 P (PG 67-22)
Dynamic Shear Rheometer, AASHTO T 315	$G^*/\sin \delta$, Test Temperature @ 10 rad/sec, °C Phase Angle, δ , (PG 76-22 Only)	Minimum 1.00 kPa Maximum 75 degrees
Rolling Thin Film Oven Test Residue (AASHTO T 240)		
Rolling Thin Film Oven, AASHTO T 240	Mass Loss%	Maximum 0.50
Dynamic Shear Rheometer, AASHTO T 315	$G^*/\sin \delta$, Test Temperature @ 10 rad/sec, °C	Minimum 2.20 kPa
Pressure Aging Vessel Residue (AASHTO R 28) at 100°C		
Dynamic Shear Rheometer, AASHTO T 315	$G^* \sin \delta$, 10 rad/sec. @ 25°C	Maximum 5000 kPa
Creep Stiffness, AASHTO T 313	S (Stiffness), @ 60 sec. @ -12°C M-value, @ 60 sec. @ -12°C	Maximum 300 Mpa Minimum 0.300

916-1.3.5 Notification and Evaluation: In the event that a Specification Compliance test is outside specification requirements or a Quality Control test is outside limits established by the supplier as part of his Quality Control Program shipments of that product to Department projects will cease immediately and the Contractor and the State Materials Office will be notified and the product retested for Specification Compliance (resampling as appropriate). Where the retest for Specification Compliance meets all requirements, shipments of that product may resume. Where off-specification material has been shipped and the retest confirms the original test, the Contractor and State Materials Office will be informed of the steps taken to achieve specification compliance on the product shipped.

Where off-specification materials has been shipped, further shipment of that product to Department projects shall remain suspended until the cause of the problem is evaluated and corrected by the supplier to the satisfaction of the State Materials Engineer.

916-1.3.6 Certification and Verification: The supplier shall furnish certification on the bill of lading for each shipment of PG binder delivered to a Department project that includes: the quantity, the Superpave PG asphalt binder grade (including QPL number), PG binder LOT designation, the customer name, the delivery location, a statement that the binder is in conformance with 916-1 and the suppliers Quality Control Program, and the quantity of silicone and anti-strip agent addition, as applicable, including product designation (QPL number as applicable). Any special handling or temperature requirements shall be indicated on the certification and are solely the responsibility of the Contractor to follow.

The Department may sample and test PG binder from the suppliers storage tank, the delivery vehicle, and/or Contractors storage tank to verify and determine compliance with this and other specification requirements. Where these tests identify material outside specification requirements, the State Materials Engineer may require the supplier to cease shipment of that PG binder product. Further shipment of that PG binder product to Department projects may remain suspended until the cause of the problem is evaluated and corrected by the supplier as necessary to the satisfaction of the State Materials Engineer.

916-2 Recycling Agents.

916-2.1 Requirements: The asphalt recycling agent (RA) shall be an asphalt binder (PG asphalt binder) or an asphalt binder blended (as necessary) with a softening agent or flux oil, and shall meet the four Target Viscosity values of 550, 750, 1000, and 1500 poises and the following requirements:

919 GROUND TIRE RUBBER FOR USE IN ASPHALT RUBBER BINDER. (REV 6-22-09) (FA 6-25-09) (1-10)

ARTICLE 919-3 (Page 843) is deleted and the following substituted:

919-3 Physical Requirements.

The physical properties of the ground tire rubber shall be determined in accordance with FM 5-559, and shall meet the following requirements:

Specific Gravity 1.06 to 1.20

Moisture ContentMaximum 0.75%

Metal ContaminantsMaximum 0.01%

Gradation - The gradation shall meet the limits shown in Table 919-1 for the type of rubber specified.

Table 919-1 Gradations of Ground Tire Rubber			
Sieve Size % Passing	Type A	Type B	Type C
No. 16	---	---	100
No. 30	---	100	70-100
No. 50	100	40-60	20-40
No. 100	50-80	---	---

923 WATER FOR CONCRETE.
(REV 5-20-10) (FA 6-9-10) (1-11)

SECTION 923 (Pages 848 - 849) is deleted and the following substituted:

SECTION 923
WATER FOR CONCRETE

923-1 General Requirements.

Water for use with cement shall be clear and free from oil, and injurious amounts of acid, alkali, chlorides, organic matter, and other deleterious substances. It shall not be salty or brackish. If it contains quantities of substances which discolor it or make it smell or taste unusual or objectionable or cause suspicion, it shall not be used unless approved by the Department. Water sources permitted include potable water supplies that are approved by a public health department, open bodies of water, well water, reclaimed water, and recycled water. Reclaimed water shall be as defined in Chapter 62-610, F.A.C. Open bodies of water are defined as naturally occurring rivers, lakes, and ponds. Recycled water includes wash water from mixer washout operations (stored in a lined settling pond). All other sources of water not listed above shall be considered recycled and reclaimed water. Recycled and reclaimed may be used only to sprinkle the coarse aggregate stockpiles and for batching concrete meeting the requirements of Section 347.

923-2 Evaluation of Water for Concrete.

923-2.1 General: Water from potable water supplies approved by a public health department may be used without additional testing. The concrete producer shall provide test data of water samples from other sources. To determine chemical properties, use a laboratory accredited by the National Environmental Laboratory or Construction Materials Engineering Council Accreditation Program. To determine physical properties, use a laboratory accredited by the Construction Materials Engineering Council Accreditation Program or Cement and Concrete Reference Laboratory.

923-2.2 Initial Sampling and Testing Frequency: Open bodies of water and well water shall be initially sampled once prior to use. Recycled and reclaimed water shall be tested once per week for four weeks initially, and thereafter once per month for four months prior to its use, provided that the results of the test samples comply with all the applicable limits. Failing test results will result in restarting initial sampling and testing.

923-2.3 Production Sampling and Testing Frequency: Open bodies of water and recycled water shall be tested monthly. Well water and reclaimed water shall be tested once every three months. If the last eight consecutive well water and reclaimed water samples meet the requirements, then the sample frequency may be reduced to one sample every six months, as approved by the Department. If a well water or reclaimed water sample fails once the frequency has been reduced, then the sampling frequency shall revert back to once every three months.

923-3 Chemical Requirements.

923-3.1 Testing: All chemical analysis or tests shall be performed in accordance with the test methods listed in Tables 1 and 2 or Standard Methods for the Examination of Water and Wastewater.

923-3.2 Recycled and Reclaimed Water: Recycled and reclaimed water shall be tested before use and shall not exceed the limits in Table 1:

Table 1		
Chemical Test	Test Method	Maximum (%)
Equivalent Alkalis as (Na ₂ O + 0.658 K ₂ O)	ASTM D 6919	0.06
Total Solids	AASHTO T 26	5.00
Total Chlorides as Cl ⁻	ASTM D 512	0.031
Total Sulfates as SO ₄	ASTM D 516	0.30

923-3.3 Open Bodies of Water and Well Water: Open bodies of water and well water shall be tested before use and shall not exceed the limits of Table 2:

Table 2		
Chemical Test	Test Method	Maximum (%)
Acidity or Alkalinity Calculated in terms of Calcium Carbonate	AASHTO T 26	0.05
Total Organic Solids	AASHTO T 26	0.05
Total Inorganic Solids	AASHTO T 26	0.08
Total Chlorides as Cl ⁻	ASTM D 512	0.031
Total Sulfates as SO ₄	ASTM D 516	0.30

923-4 Physical Requirements for Mortar.

Mortar shall be tested in accordance with ASTM C 109 with the following exception: the mortar shall not be tested for flow. The mortar, composed of the sampled water, shall have a compressive strength of not less than 90% when compared to a mortar prepared using distilled water and tested at seven days.

Water of a questionable quality, as determined by the Department, shall be subject to the acceptance criteria for time of set as required by ASTM C 1602, Table 1.

926 EPOXY COMPOUNDS.

(REV 1-4-10) (FA 1-14-10) (7-10)

ARTICLE 926-1 (Pages 854 – 855) is deleted and the following substituted:

926-1 Types of Compounds.

Epoxy resin compounds for application to portland cement concrete, bituminous cement concrete, metals and other type surfaces shall be two-component systems of the applicable of the following types as designated.

Type	Description
A	An epoxy resin, for bonding fresh concrete to hardened concrete.
B	An epoxy resin adhesive, for bonding hardened concrete to hardened concrete and constructing doweled splices in precast prestressed concrete piles.
E	A fluid epoxy for crack injection in the repair of old structures.

Type	Description
F	An epoxy for repairing spalled areas on concrete bridge structures with these subtypes:
F-1	A non sagging gel type for vertical surfaces.
F-2	A pourable type for repairs where forms are to be used.
G	An epoxy for rebuilding expansion joints and associated wearing surfaces.
H	An epoxy for structural bonding where asphalt overlays are to be in contact with the hardened compound.
I	An epoxy for filling small holes in concrete such as lifting bolt cut-outs on beams, etc.
J	An epoxy for installing rebar and anchor bolts into hardened concrete.
K	An epoxy for underwater sealing of the bottom of the jacket of an integral pile jacket system.
L	An epoxy for coating the interior of sewage disposal tanks.
M	A coal tar epoxy coating for steel sheet piles and H piles (water immersion).
N	An epoxy for preparing mortars and concrete for patching portland cement concrete pavement.
Q	An epoxy for use in post tensioning anchorage protection systems.
T	Hot applied coal tar epoxy tape.

SUBARTICLE 926-2.2 (PAGE 855) is deleted and the following substituted:

926-2.2 Qualified Products List: All epoxy materials shall be one of the products listed on the Department's Qualified Products List (QPL). Manufacturers seeking evaluation of their products shall submit product data sheets, performance test reports from an independent laboratory showing the product meets the requirements of this section, an infrared identification curve (2.5 to 15 μm) and a QPL application in accordance with Section 6. Information on the QPL application must identify the epoxy type.

Products may only be used for applications recommended by the manufacturer.

931 METAL ACCESSORY MATERIALS FOR CONCRETE PAVEMENT AND CONCRETE STRUCTURES.

(REV 3-26-10) (FA 5-26-10) (1-11)

SUBARTICLE 931-1.1 (Page 875) is deleted and the following substituted:

931-1.1 Steel Bars: Unless otherwise shown in the plans, billet steel bars for concrete reinforcement shall conform to the requirements of ASTM A-615 Grade 60 except that the process of manufacture will not be restricted. For processes not included in ASTM A-615 the phosphorus content will be limited to 0.08%.

The following special requirements shall apply:

- (1) Unless otherwise specified or shown on the plans all reinforcement bars No. 3 and larger shall be deformed bars.
- (2) All billet-steel bars shall be of the grade called for on the plans.
- (3) Twisted bars shall not be used.

(4) Wherever in the Specifications the word “purchaser” appears it shall be taken to mean the Department.

Acceptance of reinforcing steel shall be based on test samples taken randomly by the Department and manufacturer’s certified mill analysis of test results meeting the specification limits of the ASTM or AASHTO designation for the particular size, grade and any additional requirements. Randomly taken test samples and certification of test values, representing each production LOT of reinforcing steel, shall be provided to the Engineer for each Contract prior to use. Randomly taken test samples shall be cut from bundled steel that is shipped to the jobsite.

932 NONMETALLIC ACCESSORY MATERIALS FOR CONCRETE PAVEMENT AND CONCRETE STRUCTURES.

(REV 8-2-10) (FA 8-12-10) (1-11)

SUBARTICLE 932-1.2.2 (Page 878) is deleted and the following substituted:

932-1.2.2 Material: The joint sealant shall be composed of a mixture of materials, typically but not limited to bituminous based, that will melt when heated for application and then solidify to form a resilient and adhesive compound capable of sealing joints in portland cement concrete and/or asphaltic concrete against the infiltration of moisture and foreign materials throughout normal pavement conditions and at ambient temperatures. The manufacturer shall have the option of formulating the material according to their Specifications. However, the requirements delineated in this Specification shall apply regardless of the type of formulation used. The material shall cure sufficiently to not flow from the joint or be picked up by vehicle tires after 3 hours at 77°F. The material shall be capable of a uniform application consistency suitable for filling joints without the inclusion of large air holes or discontinuities and without damage to the material.

Materials for pavement joints shall be tested according to ASTM D 5329.

932-1.2.2.1 Physical Requirements of Joint Sealants for Portland

Cement Concrete Only:

Parameter	Limits
Pour Point	At least 20°F lower than the safe heating temperature as stated by the manufacturer.
Cone-Penetration, Non-immersed at 77°F, 150 g, 5 s	Less than or equal to 90 mm
Flow at 40°F, 5 h	Less than or equal to 5.0 mm
Bond, Non-immersed, 0°F for 5 cycles*	No cracking, separation, or opening that at any point is over 1/4 inch deep, in the sealant or between the sealant and the substrate.
*The depth of a crack, separation or opening shall be measured perpendicular to the side of the sealant showing the defect. At least two test samples in a group of three representing a given sample of sealant shall meet this requirement.	

932-1.2.2.2 Physical Requirements of Joint Sealants for Portland

Cement Concrete and/or Asphaltic Concrete:

Parameters	Limits
Pour Point	At least 20° lower than the safe heating temperature as stated by the manufacturer.
Cone-Penetration, Non-immersed at 77°F, 150 g, 5 s	Less than or equal to 90 mm
Flow at 40°F, 5 h	Less than or equal to 3.0 mm
Bond, Non-immersed, -20°F for 3 cycles, 50% extension*	No cracking, separation, or opening that at any point is over 1/4 inch deep, in the sealant or between the sealant and the substrate.
Resilience at 77°F	Recovery greater than or equal to 60%
Asphaltic Concrete Compatibility at 140°F	No failure in adhesion, formation of an oily exudates at the interface between the sealant and the asphaltic concrete, or softening or other deleterious effects on the asphaltic concrete or sealant.
*The depth of a crack, separation or opening shall be measured perpendicular to the side of the sealant showing the defect. At least two test samples in a group of three representing a given sample of sealant shall meet this requirement.	

SUBARTICLE 932-1.2.4 (Page 879) is deleted and the following substituted:

932-1.2.4 Qualified Products List: The joint sealant materials used shall be one of the products listed on the Department's Qualified Products List (QPL). Manufacturers seeking evaluation of their products shall submit product datasheets, performance test reports from an independent laboratory showing the product meets the requirements of this section, and a QPL application in accordance with Section 6. Information on the QPL application must identify the sealant type.

SUBARTICLE 932-1.3.2 (Pages 880 - 882) is deleted and the following substituted:

932-1.3.2 Physical Requirements:

SILICONE SEALANT TYPE	Test Method	Type A	Type B	Type C	Type D
Flow (maximum)	MIL S 8802	0.3 inches			
Extrusion rate	MIL S 8802	1.25-4.2 g/s	1.7-11.0 g/s	4.58-9.2 g/s	3.3 – 9.2 g/s
Tack-free time at 77 ± 3°F and 45 to 55% Relative Humidity	MIL S 8802	20-75 minutes	120 minutes, maximum	60 minutes, maximum	30 - 60 minutes
Specific gravity	ASTM D 792, Method A	1.1 to 1.515	1.10 to 1.40	1.26 to 1.34	1.26 to 1.34
Durometer hardness, Shore A (Cured seven days)	ASTM D 2240	10-25			

SILICONE SEALANT TYPE	Test Method	Type A	Type B	Type C	Type D
at 77 ± 3°F and 50 ± 5% Relative Humidity)					
Durometer hardness, Shore 00 (Cured 21 days at 77 ± 3°F and 50 ± 5% Relative Humidity)	ASTM D 2240		40-80	20-80	
Tensile stress (maximum) at 150% elongation	ASTM D 412 (Die C)	45 psi	40 psi	15 psi	
Elongation (Cured seven days at 77 ± 3°F and 50 ± 5% Relative Humidity)	ASTM D 412 (Die C)	800% minimum			600% minimum
Elongation (Cured 21 days at 77 ± 3°F and 50 ± 5% Relative Humidity)	ASTM D 12 (Die C)		800% minimum	1400% minimum	
Ozone and Ultraviolet Resistance	ASTM C 793	No chalking, cracking or bond loss after 5,000 hours, minimum.			
Bond to concrete mortar briquets (primed if required) (Cured seven days at 77 ± 3°F and 50 ± 5% Relative Humidity)	AASHTO T-132	50 psi minimum			
Bond to concrete briquets (Cured 21 days at 77 ± 3°F and 50 ± 5% Relative Humidity)	AASHTO T-132		40 psi minimum	35 psi minimum (includes bond to asphalt)	
Movement Capability	ASTM C 719	No adhesive or cohesive failure and adhesion, 10 cycles at -50 to +100%			No adhesive or cohesive failure and adhesion, 10 cycles at +100/-50 % (joints 2" wide)

Portland Cement Mortar: Briquets shall be molded and cured 28 days minimum in accordance with AASHTO T-132. Cured briquets shall be dried at $230 \pm 5^{\circ}\text{F}$, sawed in half and bonded together with a thin section of sealant. After cure of sealant, briquets shall be tested in accordance with AASHTO T-132.

SUBARTICLE 932-1.3.4(Page 882) is deleted and the following substituted:

932-1.3.4 Qualified Products List: The low modulus silicone sealant used shall be one of the products listed on the Department's Qualified Products List. Manufacturers seeking evaluation of their products shall submit product datasheets, performance test reports from an independent laboratory showing the product meets the requirements of this section, an infrared identification curve (2.5 to 15 μm) and a QPL application in accordance with Section 6. Information on the QPL application must identify the sealant type.

SUBARTICLES 932-1.4 to 932-1.6 (Pages 882 – 883) are deleted and the following substituted:

932-1.3.5 Primer: When required by the manufacturer's product, a primer shall be used.

The manufacturer shall perform quality control tests on each LOT of sealant primer material furnished to each project and furnish a certified report that each LOT of primer material furnished to a project meets his Company's Specifications for that product and the primer is suitable for its intended use.

Sealant primer material shall be delivered in containers plainly marked with the manufacturer's name or trademark and product name, LOT number and date of expiration.

932-1.3.6 Backer Rod and Tape Bond Breakers: Backer rods and tape shall be compatible with the joint sealant and approved by the sealant manufacturer. No bond or reaction shall occur between the rod and the sealant.

932-1.3.7 Installation: Installation, material selection, joint dimensions, bond breaker suitability (by type and project) shall be in agreement with the requirements of Design Standards, Index Nos. 305 and 21110. Any modifications or exceptions to these requirements shall be shown in the plans.

For new construction projects or general use where the joints to be sealed have uniform width, a closed cell, expanded polyethylene foam backer rod bond breaker shall be required. For rehabilitation projects and similar joint seals where the joints to be sealed have irregular width, an open cell, expanded polyethylene foam backer rod bond breaker with an impervious skin shall be required.

The backer rod shall be compatible with the joint sealant. No bond or reaction shall occur between the rod and the sealant.

Tape bond breaker approved by the sealant manufacturer may be used in lieu of backer rod bond breaker when sealing joints and/or random cracks, as required.

Type D Silicone sealant shall be placed when the ambient temperature is rising and is between 55°F and 85°F and the temperature is expected to rise for the next three

hours minimum to provide to adequate joint opening and compression of the sealant during curing.

All installed bond breakers shall be covered by sealant at the end of each work day.

A tolerance in cross-sectional height at midpoint of $-1/16$ to $+3/16$ inch will be allowed to the nominal values shown for each joint width on the plan sheet. The Engineer shall check one joint for each 1,000 feet of roadway by cutting out specimens. If the cross section of the cut specimen is out of the allowable range, additional specimens shall be taken as follows:

One joint every 100 feet of pavement not to exceed 500 feet.

If the average of the specimens is out of tolerance, the Contractor shall remove and replace the entire 500 feet section at no additional expense to the Department.

Installation tolerance shall be verified at 1,000 feet intervals.

932-1.4 Pre-cured Silicone Sealant:

932-1.4.1 General: Pre-cured silicone sealants are intended for sealing vertical joints on concrete surfaces. Type V1 sealant is intended for contraction joints or joints with movements less than $1/4$ inch. Type V2 sealant is intended for expansion joints not exceeding 200% of the nominal joint opening. Type V2 sealant may be substituted for Type V1 sealant. The joint sealant must be listed on the Department's Qualified Products List (QPL).

932-1.4.2 Physical Requirements: Sealant material shall be a nominal $1/16$ inch thick, available in standard widths from 1 inch to 6 inches, colored to match the finish surface coating of the concrete, and meet the following minimum testing requirements:

TEST PROPERTY DESCRIPTION	TEST METHOD	TYPE V1	TYPE V2
Minimum Movement, Cohesion/Adhesion	ASTM C 1523	100%	200%
Dry/Room Temperature Loss of Adhesion/Cohesion	ASTM C 1523	None	None
Water Immersion Loss of Adhesion/Cohesion	ASTM C 1523	None	None
Frozen Loss of Adhesion/Cohesion	ASTM C 1523	None	None
Heat Loss of Adhesion/Cohesion	ASTM C 1523	None	None
Artificial Weathering Loss of Adhesion/Cohesion	ASTM C 1523	None	None
Artificial Weathering Loss of Adhesion/Cohesion	ASTM C 1523	None	None
Tear Propagation	ASTM C 1523	NT or PT (No Tear or Partial/Knotty Tear)	NT or PT (No Tear or Partial/Knotty Tear)
Ultimate Elongation	ASTM D 412	250%	500%

932-1.4.3 Qualified Products List: Manufacturers seeking evaluation of their product shall submit an application in accordance with Section 6. Applications must include test results, an Infrared Absorption scan, and a product data sheet with the recommended adhesive and installation requirements.

932-1.5 Compression Seals and Adhesive Lubricant

932-1.5.1 Preformed Elastomeric Compression Seals: Preformed Elastomeric Compression Seals shall meet the requirements of ASTM D 2628 except that immersion oil IRM 903 may be substituted for Oil No. 3 in the Oil Swell test procedure.

932-1.5.2 Compression Seal Adhesive Lubricant: Compression Seal Adhesive Lubricant shall meet the requirements of ASTM D 4070. The material shall be fluid from 5° to 120°F (-15° to 49°C).

932-1.5.3 Certification: The manufacturer shall provide a certified test report for each lot of material furnished to each project along with a statement certifying that the material conforms to this specification and identifying the project number and manufacturer's lot number.

932-1.5.4 Verification Samples: Provide verification samples in accordance with Section 6.

948 MISCELLANEOUS TYPES OF PIPE.

(REV 5/19/10) (FA 6-9-10) (1-11)

SUBARTICLE 948-1.7 (Page 901) is deleted and the following substituted

948-1.7 Polyvinyl Chloride (PVC) Pipe (12 to 36 Inches): Polyvinyl Chloride (PVC) Pipe for side drain, cross drain, storm drain and other specified applications shall conform to AASHTO M-278 for smooth wall PVC pipe or ASTM F-949 for PVC ribbed pipe. Mitered end sections are not to be constructed of polyvinyl chloride. Use only concrete or metal mitered end sections as indicated in the Design Standards.

All pipe produced and shipped to the job site shall meet the requirements of 105-3.2.

SUBARTICLE 948-2.3 (Pages 901 – 904) is deleted and the following substituted:

948-2.3 Corrugated High Density Polyethylene Pipe (12 to 60 inches):

948-2.3.1 General: Class I (50 year) corrugated Polyethylene Pipe used for side drain, storm and cross drain or french drain shall meet the requirements of AASHTO M-294. Class II Corrugated Pipe shall meet the requirements of AASHTO M-294 and the additional requirements as specified herein. Corrugations may only be annular. Ensure that pipe resin conforms to ASTM D-3350 minimum cell classification 435400C except that cell class 435400E may be used if the combination of color and UV stabilizer provides the same or better UV protection than that of resin cell class 435400C. Mitered end sections are not to be constructed of polyethylene. Use only concrete or metal mitered end sections as indicated in the Design Standards.

All pipe produced and shipped to the job site shall meet the requirements of 105-3.2.

948-2.3.2 Additional Requirements for Class II (100 Year), Type S Polyethylene Pipe Meet the following requirements:

Table 1			
Stress Crack Resistance of Pipes			
Pipe Location	Test Method	Test Conditions	Requirement
Pipe Liner	FM 5-572, Procedure A	10% Igepal solution at 122°F and 600 psi applied stress, 5 replicates	Average failure time of the pipe liner shall be ≥ 18.0 hours, no single value shall be less than 13.0 hours.
Pipe Corrugation ¹ , (molded plaque)	ASTM F-2136	10% Igepal solution at 122°F and 600 psi applied stress, 5 replicates	Average failure time shall be ≥ 24.0 hours, no single value shall be less than 17.0 hours.
Junction	FM 5-572, Procedure B and FM 5-573	Full Test ^{2,3} : Test at 3 temperature/stress combinations: 176°F at 650 psi 176 °F at 450 psi 158°F at 650 psi; 5 replicates at each test condition	Determine failure time at 500 psi at 73.4°F ≥ 100 years (95% lower confidence) using 15 failure time values ⁴ . The tests for each condition can be terminated at duration equal to or greater than the following criteria: 110.0 hr at 176°F 650psi 430.0 hr at 176°F 450 psi 500.0 hr at 158°F 650 psi
		Single Test ⁵ : Test temperature 176°F and applied stress of 650 psi.; 5 replicates	The average failure time must be equal to or greater than 110.0 hr
Longitudinal Profiles ⁶	FM 5-572, Procedure C, and FM 5-573	Full Test ^{2,3} : Test at 3 temperature/stress combinations: 176°F at 650 psi 176 °F at 450 psi 158 °F at 650 psi; 5 replicates at each test condition	Determine failure time at 500 psi at 73.4°F ≥ 100 years (95% lower confidence) using 15 failure time values ⁴ . The tests for each condition can be terminated at duration equal to or greater than the following criteria: 110.0 hr at 176°F 650psi 430.0 hr at 176°F 450 psi 500.0 hr at 158°F 650 psi
		Single Test ⁵ : Test temperature 176°F and applied stress of 650 psi.; 5 replicates	The average failure time must be equal to or greater than 110.0 hr

Table 1			
Oxidation Resistance of Pipes			
Pipe Location	Test Method	Test Conditions	Requirement
Liner and/or Crown ⁷	OIT Test (ASTM D-3895)	2 replicates (to determine initial OIT value) on the as manufactured (not incubated) pipe.	25.0 minutes, minimum
Liner and/or Crown ⁷	Incubation test FM 5-574 and OIT test (ASTM D-3895)	Three samples for incubation of 195 days at 176°F ⁸ and applied stress of 250 psi. One OIT test per each sample	Average of 3.0 minutes ^{9, 10} (no values shall be less than 2.0 minutes)
Liner and/or Crown ⁷	MI test (ASTM D-1238 at 190°C/2.16 Kg)	2 replicates on the as manufactured (not incubated) pipe.	< 0.4 g/10 minutes
Liner and/or Crown ⁷	Incubation test FM 5-574 and MI test (ASTM D-1238 at 190°C/2.16 Kg)	2 replicates on the three aged sampled after incubation of 195 days at 176°F ⁸ and applied stress of 250 psi	MI Retained Value ^{10, 11, 12} shall be greater than 80% and less than 120%.
<p>Note: FM = Florida Method of Test. 1 Required only when the resin used in the corrugation is different than that of the liner.</p> <p>2 A higher test temperature (194° F) may be used if supporting test data acceptable to the State Materials Engineer is submitted and approved in writing.</p> <p>3 Full test shall be performed on alternative pipe diameter of pipe based on wall profile design, raw material cell classification, and manufacturing process. Full test must be performed on maximum and minimum pipe diameters within a manufacturing process.</p> <p>4 Computer program to predict the 100 year SCR with 95% lower confidence can be obtained from FDOT.</p> <p>5 Single test for the junction and longitudinal profile may be used on alternating pipe sizes within a manufacturing process. Single point tests may not be used on maximum and minimum pipe sizes within a manufacturing process except by approval of the Engineer. Single point tests may be used for quality assurance testing purposes.</p> <p>6 Longitudinal profiles include vent holes and molded lines.</p> <p>7 OIT and MI tests on the crown are required when resin used in the corrugation is different than that of the liner.</p> <p>8 The incubation temperature and duration can also be 136 days at 185°F.</p> <p>9 Within each replicate set of tests, the discrepancy range shall be within 6%. If an out-of range discrepancy occurs, repeat the three OIT tests.</p> <p>10 The tests for incubated and “as-manufactured” pipe samples shall be performed by the same lab, same operator, the same testing device, and in the same day.</p> <p>11 Within each replicate set of tests, the discrepancy range shall be within 9%. If an out-of-range discrepancy occurs, repeat the two MI tests on the same pipe sample. If insufficient material is available, a repeat of one test is acceptable.</p> <p>12 The MI retained value is determined using the average MI value of incubated sample divided by the average MI value of as-manufactured pipe sample.</p>			

Manufacturer may use ground class II, but not class I, pipe for reworked plastic.

948-2.3.3 Certification: Furnish to the Engineer certification from the manufacturer for each pipe diameter manufacturers LOT to be incorporated into the project that the pipe meets the requirements of these Specifications.

Manufacturers seeking evaluation of a product in accordance with Departmental procedures must submit test reports conducted by a laboratory qualified by the Geosynthetic Accreditation Institute-Laboratory Accreditation Program (GAI-LAP) or qualified by ISO 17025 accreditation agency using personnel with actual experience running the test methods for class II HDPE pipe. Submit the test reports to the State Materials Office.

948-2.3.4 Verification Samples: Furnish verification samples as directed by the Engineer.

ARTICLE 948-4 (Pages 905 – 906) is deleted and the following substituted:

948-4 Pipe Liner.

948-4.1 Cured-In-Place Pipe Liner: Cured-in-place pipe liner shall be continuous, resin impregnated, flexible tubing that meets the requirements of ASTM D-5813 and ASTM F-1216.

948-4.2 Deformed Pipe Liner: Deformed pipe liner shall be manufactured in an out of round state, usually collapsed circumferentially and folded on the long axis. After installation in a host pipe, the liner is rounded by means of heat and pressure to fit the host pipe. Deformed pipe liner, when installed, shall extend from one structure to the next in one continuous length with no intermediate joints.

(1) Polyethylene: Deformed polyethylene pipe liner shall meet the requirements of ASTM F-714 with a minimum cell classification of 335420c.

(2) Polyvinyl Chloride: Deformed polyvinyl chloride pipe liner shall meet the requirements of ASTM F-1504.

948-4.3 Discrete Pipe Liner: Discrete pipe liner shall be round, flexible or semi-rigid liner, manufactured in lengths that may be joined in a manhole or access pit before insertion in a host pipe.

(1) High Density Polyethylene Solid Wall: Discrete high density polyethylene pipe liner shall meet the requirements of ASTM F-714 or AASHTO M-326 and shall have a minimum of cell classification of 345464c.

(2) High Density Polyethylene Profile Wall: Discrete high density polyethylene pipe liner shall meet the requirements of AASHTO M-294 and shall have a minimum cell classification of 435400c.

(3) Polyvinyl Chloride: Discrete polyvinyl chloride pipe liner shall meet the requirements of ASTM F-794, ASTM F-949, or AASHTO M-304 and shall have a minimum cell classification of 12454.

(4) Fiberglass: Discrete fiberglass pipe liner shall meet the requirements of ASTM D-3262.

948-4.4 Spiral Wound Pipe Liner: Spiral wound pipe liner shall consist of coils of profile strips that are wound into a host pipe helically, after which a cementitious grout is injected into the annular space between the liner and the host pipe, forming a rigid composite structure.

(1) Polyvinyl Chloride: Polyvinyl chloride spiral wound pipe liner shall meet the requirements of ASTM F-1697 or ASTM F-1735 and shall have a minimum cell classification of 12454.

948-4.4.1 Machine Spiral Wound Pipe Liner: Machine spiral wound pipe liner shall consist of a continuous one piece profile strip wound directly into the deteriorated pipelines. The liner can be installed in close fit to the host pipe, or alternatively installed at a fixed diameter. Where the liner is installed at a fixed diameter, the annular space between the spiral wound liner pipe and the existing pipe is grouted.

(1) Polyvinyl Chloride: Polyvinyl chloride machine spiral wound pipe liner shall meet the requirements of ASTM F-1697 and shall have a minimum cell classification of 12454.

948-4.5 Paneled Pipe Liner: Paneled pipe liner consists of custom-cut flat or curved panels that are formed to the inside circumference of a host pipe.

(1) Polyvinyl Chloride: Polyvinyl chloride paneled pipe liner shall meet the requirements of ASTM F-1735 and shall have a minimum cell classification of 12454.

948-4.6 Point Pipe Liner: Point pipe liner may consist of any materials covered by this specification when used to repair and rehabilitate an isolated portion of an existing storm drain pipe. Materials which are restricted (as primary components) to point repair are; steel, which shall meet the requirements of AASHTO M-167M, ASTM A-167, or ASTM A-240; aluminum, which shall meet the requirements of AASHTO M-196, and rubber; which shall meet the requirements of ASTM C-923.

948-4.7 Coated Pipe Liner: Coated pipe liner consists of liquid, slurry, foam or gel that is spread or sprayed over the interior surface of an existing pipe to rehabilitate it. Materials that may be used for coating are hydrophilic urethane gel, epoxy resin, polyester resin, gunite, shotcrete, low density cellular concrete, and cementitious grout.

962 STRUCTURAL STEEL AND MISCELLANEOUS METAL ITEMS (OTHER THAN ALUMINUM).

(REV 2-23-10) (FA 5-4-10) (1-11)

SUBARTICLE 962-1.2 (Page 914) is deleted and the following substituted:

962-1.2 Testing: For structural steel subjected to tensile stress used for main load-carrying members or components (as defined in Section 460), meet the ASTM A 709 impact test requirements for non-fracture and fracture critical tension components as specified in the Contract Documents. Meet the requirements for Zone 1 (Minimum Service Temperature 0°F).

If not specified elsewhere in the Contract Documents, provide structural steel in accordance with ASTM A 709 requirements for non-fracture and fracture critical tension components as directed by the Engineer.

SUBARTICLE 962-8.2 (Page 916) is deleted and the following substituted:

962-8.2 Steel Sheet Piling: Provide steel sheet piles conforming to the requirements of ASTM A-328, ASTM A-572 or ASTM A-690.

SUBARTICLE 962-8.4.2 (Page 917) is deleted and the following substituted:

962-8.4.2 Testing: Structural steel tubing subjected to tensile stresses used in main load carrying members or components (as defined in Section 460) shall meet the impact test requirements of ASTM A 709 for non-fracture and fracture critical tension components for Zone 1. Minimum Average energy shall be: 15 ft-lbf at 70°F (non-fracture critical); or 25 ft-lbf at 70°F (fracture critical).

971 TRAFFIC MARKING MATERIALS.
(REV 5-6-10) (FA 5-11-10) (8-10)

SECTION 971 (Pages 922-936) is deleted and the following substituted:

SECTION 971
TRAFFIC MARKING MATERIALS

971-1 General Requirements.

971-1.1 Packaging and Labeling: All traffic marking materials shall be shipped in strong containers plainly marked with the weight in pounds per gallon, the volume of traffic marking materials content in gallons, the color, user information, date of manufacture, batch and DOT code number. Each batch manufactured shall have a unique number. A true statement of the percentage composition of the pigment, the proportion of pigment to vehicle, and the name and address of the manufacturer, also shall be shown. The label shall warn the user of any special handling or precautions of the material, as recommended by the manufacturer. Any package not so marked will not be accepted for use under these specifications.

Preformed thermoplastic materials and permanent tape products shall be marked with content, color, date of manufacture and batch number.

971-1.2 Storage: Any traffic marking materials which, although inspected and approved at the point of manufacture, hardens or livers in the containers so that it cannot be readily broken up with a paddle to a smooth, uniform painting consistency, will be rejected. All materials shall have a container storage life of one year from date of manufacture. Any traffic marking materials not acceptable for proper application will be rejected, even though it conforms to these Specifications in all other respects.

971-1.3 Mixing: All paints shall be delivered to the project completely mixed, and ready to be used without additional oil or thinner. Gasoline shall not be used for thinner under any circumstances.

971-1.4 Qualified Products List: All traffic marking materials shall be one of the products listed on the Qualified Products List. Manufacturers seeking evaluation of their product shall submit an application in accordance with Section 6 accompanied by a copy of the infrared identification curve (2.5 to 15 μ m) for the vehicle component. Products may only be used for applications recommended by the manufacturer. A notation of the number of coats and the thickness of each coat at which the product passes testing may be placed on the QPL. When listed, this will be the minimum criteria for application of the traffic marking material.

971-1. 5 Samples: Field samples will be obtained in accordance with the Department's Sampling, Testing and Reporting Guide Schedule.

971-1. 6 Color: Materials for pavement markings shall meet the following performance requirements.

The initial daytime chromaticity for yellow materials shall fall within the box created by the following coordinates:

Initial Daytime Chromaticity Coordinates (Corner Points)

	1	2	3	4
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X	0.530	0.510	0.455	0.472
Y	0.456	0.485	0.444	0.400

The in-service daytime chromaticity for yellow materials shall fall within the box created by the following coordinates:

In-Service Daytime Chromaticity Coordinates (Corner Points)

	1	2	3	4
X	0.530	0.510	0.435	0.449
Y	0.456	0.485	0.429	0.377

The nighttime chromaticity for yellow materials shall fall within the box created by the following coordinates:

Nighttime Chromaticity Coordinates (Corner Points)

	1	2	3	4
X	0.575	0.508	0.473	0.510
Y	0.425	0.415	0.453	0.490

971-1.7 Additional Requirements: Traffic stripe materials shall be characterized as non-hazardous as defined by Resource Conservation and Recovery Act (RCRA) 40 CFR 261 and the material shall not exude fumes which are hazardous, toxic or detrimental to persons or property. Provide supporting independent analytical data or product Material Safety Data Sheets (MSDS) identifying nonhazardous designations.

Additionally, traffic stripe materials shall contain no more than 5.0 ppm lead by weight when tested in accordance with the RCRA reference above. Provide supporting independent analytical data.

971-2 Glass Spheres.

971-2.1 General Requirements: Glass spheres shall be of a composition designed to be highly resistant to traffic wear and to the effects of weathering for the production of a reflective surface, creating night visibility of the pavement markings without altering day visibility of the marking. The general requirements of 971-1 apply to glass spheres.

971-2.2 Specific Properties: The large (Type 3 or larger) glass spheres used for drop on beads shall have an adhesion coating. Type 1 glass spheres used for drop on beads shall have a dual coating. Beads used in the intermix of materials are not required to be coated.

The following physical requirements apply:

Property	Test Method	Specification
Roundness*	ASTM D 1155	Min: 70 % by weight
Roundness**	ASTM D 1155	Min: 80% by weight
Refractive Index*	Becke Line Method (25+/-5C)	1.5 minimum
Refractive Index**	Becke Line Method (25+/-5C)	1.9 minimum
*Type 1, 3, 4 and 5 beads		
**High Index beads		

Sieve Size	Percent by Mass Passing Designated Sieve (ASTM D 1214)				
	Grading Designation				
	Type 1 (AASHTO)	Type 3 (FP 96)	Type 4 (FP 96)	Type 5 (FP 96)	High Index
No. 8				100	
No. 10			100	95 – 100	
No. 12		100	95 – 100	80 – 95	
No. 14		95 – 100	80 – 95	10 – 40	
No. 16	100	80 – 95	10 – 40	0 – 5	100
No. 18		10 – 40	0 – 5	0 – 2	
No. 20	95 - 100	0 – 5	0 – 2		95 - 100
No. 25		0 – 2			
No. 30	75 – 95				55 - 85
No. 40					15 - 45
No. 50	15 – 35				0 - 5
No. 80					
No. 100	0 – 5				

Provide the Engineer Certified test reports from the manufacturer confirming that all glass spheres conform to the requirements of this Section.

971-2.3 Sampling:

971-2.3.1 Sampling: A random 50 lb sample of glass spheres shall be obtained for each 50,000 lb shipped. Upon arrival, the quantity of material will be reduced in a sample splitter to a size of approximately 1 quart by the Engineer, or one 50 lb unopened bag.

971-2.3.2 Containers: The spheres shall be furnished in new 50 lb moisture-proof bags. All containers shall meet ICC requirements for strength and type and be marked in accordance with AASHTO 247 Part 5.

971-3 Standard Waterborne Fast Dry Traffic Paint.

971-3.1 General: Standard waterborne fast dry traffic paints intended for use under this Specification shall include water reducible products that are single packaged and ready mixed. Upon curing, these materials shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The material shall have the capability of being cleaned and flushed from the striping machines using regular tap water and any required rust inhibitors. The manufacturer shall have the option of formulating the material according to his own specifications. However, the requirements delineated in this Specification and Section 710 shall apply regardless of the type of formulation used. The material shall be free from all skins, dirt and foreign objects.

971-3.2 Composition:

Component	Test Method	Criteria
Total Solids, by weight	ASTM D 2369	minimum 75%
Pigments, by weight	ASTM D 3723	minimum 57%
Vehicle Solids % of Vehicle*		minimum 40%
TiO ₂ , Type II Rutile (white paint only)	ASTM D 476	minimum 1.5 lb/gal
Volatile Organic Content, (VOC)	ASTM D 3960	maximum 150 g/L
*Vehicle Solids % of Vehicle = $\frac{\% \text{ total solids} - \% \text{ pigment}}{100 - \% \text{ pigment}}$		

971-3.3 Physical Requirements: The material shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Density	ASTM D 1475	13.5 ± 1.4 lb/gal	-
Viscosity at 77°F	ASTM D 562	80 KU	100 KU
Fineness of Grind	ASTM D 1210	2(HS)	3(HS)
Dry Opacity at 5 mils WFT	ASTM D 2805	0.96	-
Bleed Ratio	ASTM D 969	0.95	-
Flexibility	ASTM D 522 Method B	Pass	-
Abrasion Resistance	971-3.3.2	Pass	-

971-3.3.1 Set To Bear Traffic Time: The material shall set to bear traffic in not more than two minutes.

971-3.3.2 Abrasion Resistance: Test four samples per LOT using a Taber Abrader. The paint shall be applied to specimen plates using a drawdown blade having a clearance of 26 mils. Air dry each sample for 30 minutes and bake at 220°F for 18 hours. Clean with a soft brush and weigh each sample. Abrade samples for 1,000 cycles with 500 g weights and CS-10 wheels. Clean the samples with a soft brush and weigh again. The average weight loss for the four plates shall not exceed 50 mg per plate.

971-3.3.3 Retroreflectivity: The white and yellow pavement markings shall attain an initial retroreflectance of not less than 300 mcd/lx·m² and 250 mcd/lx·m². The retroreflectance of the white and yellow pavement markings at the end of the six month service life shall not be less than 150 mcd/lx·m².

971-3.4 Packaging and Labeling: The traffic paint shall be placed in 55 gallon open-end steel drums with a re-usable multi-seal sponge gasket. No more than 50 gallons of material shall be placed in any drum to allow for expansion during transport and storage.

971-4 Fast Dry Solvent Traffic Paint.

971-4.1 General: Fast dry traffic paints intended for use under this Specification shall include products that are single packaged and ready mixed. Upon curing, these materials shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall have the option of formulating the material according to his own specifications. However, the requirements delineated in this Specification and Section 710 shall apply regardless of the type of formulation used. The material shall be free from all skins, dirt and foreign objects.

971-4.2 Composition:

Component	Test Method	Criteria
Total Solids, by weight	ASTM D 2369	75% minimum
Pigments, by weight	ASTM D 3723	57% minimum
Vehicle Solids, % on Vehicle*		40% minimum
TiO ₂ , Type II Rutile (white paint only)	ASTM D 476	1.5 lb/gal minimum
Volatile Organic Content, (VOC)	ASTM D 3960	150 g/L maximum

971-4.3 Physical Requirements: The material shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Density	ASTM D 1475	13.5 ± 0.37 lb/gal	N/A
Consistency at 170°F	ASTM D 562	80 KU	100 KU
Fineness of Grind	ASTM D 1210	2 (HS)	3(HS)
Dry Opacity at 5 mils WFT	Fed Std 141a Method 4121	0.96	-
Bleed Ratio	Fed Spec TT-P-85D	0.95	-
Flexibility	Fed Spec TT-P-115D	Pass	-
Abrasion Resistance	971-4.3.2	Pass	-

971-4.3.1 Set To Bear Traffic Time: The material shall set to bear traffic in not more than two minutes.

971-4.3.2 Abrasion Resistance: Test four samples per LOT using a Taber Abrader. The paint shall be applied to specimen plates using a drawdown blade having a clearance of 26 mils. Air dry each sample for 30 minutes and bake at 220°F for 18 hours. Clean with a soft brush and weigh each sample. Abrade samples for 1,000 cycles with 1.1 lb weights and CS-10 wheels. Clean the samples with a soft brush and weigh again. The average weight loss for the four plates shall not exceed 0.178 oz per plate.

971-4.3.3 Retroreflectivity: The white and yellow pavement markings shall attain an initial retroreflectance of not less than 300 mcd/lx·m² and 250 mcd/lx·m², respectively. The retroreflectance of the white and yellow pavement markings at the end of the six month service life shall not be less than 150 mcd/lx·m².

971-4.4 Application Properties: Application properties shall meet the requirements of Section 710.

971-4.5 Packaging and Labeling: The traffic paint shall be placed in 55 gallon open-end steel drums with a re-usable multi-seal sponge gasket. No more than 50 gallons of material shall be placed in any drum to allow for expansion during transport and storage.

971-5 Thermoplastic Materials for Traffic Stripes.

971-5.1 General: Upon cooling to normal pavement temperature, these materials shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall utilize alkyd based materials only and shall have the option of formulating the material according to his own specifications. However, the requirements delineated in this Specification and Section 711 shall apply regardless of the type of formulation

used. The pigment, glass spheres, and filler shall be well dispersed in the resin. The material shall be free from all skins, dirt and foreign objects.

971-5.2 Composition:

Component	Test Method	White	Yellow
Binder		20.0% minimum	20.0% minimum
TiO ₂ , Type II Rutile	ASTM D 476	10.0% minimum	-
Glass Spheres	AASHTO T 250	40.0% minimum	40.0% minimum
Yellow Pigment		-	% minimum per manufacturer
Calcium Carbonate and Inert Filler (- 200 mesh sieve)		30.0% maximum	37.5% maximum

Percentages are by weight.

The alkyd/maleic binder must consist of a mixture of synthetic resins (at least one synthetic resin must be solid at room temperature) and high boiling point plasticizers. At least one-half of the binder composition must be 100% maleic-modified glycerol of rosin and be no less than 15% by weight of the entire material formulation.

971-5.3 Glass Spheres: The glass spheres in the intermix shall consist of 50% Type 1 and 50% Type 3. Glass spheres shall meet the requirements of 971-2.

971-5.4 Sharp Silica Sand: Sharp silica sand used for bike lane symbols and pedestrian crosswalk lines shall meet the following gradation requirements:

Sieve Size	% Passing
20	100
50	0 to 10

971-5.5 Physical Requirements: Laboratory samples shall be prepared in accordance with ASTM D 4960 and shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Water Absorption	ASTM D 570	-	0.5%
Softening Point	ASTM D 36	195°F	-
Low Temperature Stress Resistance	AASHTO T 250	Pass	-
Specific Gravity	Water displacement	1.9	2.3
Indentation Resistance	ASTM D 2240* Shore Durometer, A2	40	75
Impact Resistance	ASTM D 256, Method A	1.0 N·m	-
Flash Point	ASTM D 92	475°F	-

*The durometer and panel shall be at 110°F with a 4.4 lb load applied. Instrument measurement shall be taken after 15 seconds.

971-5.5.1 Set To Bear Traffic Time: The thermoplastic shall set to bear traffic in not more than two minutes.

971-5.5.2 Retroreflectivity: The white and yellow pavement markings shall attain an initial retroreflectance of not less than 450 mcd/lx·m² and not less than 350 mcd/lx·m², respectively. The retroreflectance of the white and yellow pavement markings at the end of the three year service life shall not be less than 150 mcd/lx·m².

971-5.5.3 Durability: Durability is the measured percent of thermoplastic material completely removed from the pavement. The thermoplastic material line loss must not exceed 5.0% at the end of the service life.

971-5.6 Application Properties: Application properties shall meet the requirements of Section 711.

971-5.7 Packing and Labeling: The thermoplastic material shall be packaged in suitable biodegradable or thermo-degradable containers which will not adhere to the product during shipment and storage. The container of thermoplastic material shall weigh approximately 50 lb. The label shall warn the user that the material shall be heated in the range as recommended by the manufacturer.

971-6 Preformed Thermoplastic Materials for Traffic Stripes.

971-6.1 General: Upon cooling to normal pavement temperature, these materials shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall have the option of formulating the material according to his own specifications. However, the requirements delineated in this Specification and Section 711 shall apply regardless of the type of formulation used. The pigment, glass spheres, and filler shall be well dispersed in the resin. The material shall be free from all skins, dirt and foreign objects.

971-6.2 Composition: The preformed thermoplastic shall consist of high quality materials, pigments and glass spheres or other reflective material uniformly distributed throughout their cross-sectional area, with a reflective layer of spheres or other reflective material embedded in the top surface.

971-6.3 Glass Spheres: Material shall contain no less than 30% glass spheres by weight.

971-6.4 Color: Materials shall meet the performance requirements specified in 971-1 and the following additional requirements. The initial luminance factor, Cap Y, shall not be less than 55. The in-service luminance factor at the end of the three year service life shall not be less than 35 when measured outside the wheel paths.

971-6.5 Physical Requirements: Laboratory samples shall be prepared in accordance with ASTM D 4960 and shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Softening Point	ASTM D 36	195°F	-
Low Temperature Stress Resistance	AASHTO T 250	Pass	-
Indentation Resistance	ASTM D 2240* Shore Durometer, A2	40	75
Impact Resistance	ASTM D 256, Method A**	1.0 N·m	-

*The durometer and panel shall be at 110°F with a 4.4 lb load applied. Instrument measurement shall be taken after 15 seconds.
 **The test specimen for ASTM D 256 shall be 1 in. x 1 in. x 6 in. and shall not be notched.

971-6.5.1 Retroreflectivity: The white and yellow pavement markings shall attain an initial retroreflectance of not less than 300 mcd/lx·m². The retroreflectance of the white pavement markings at the end of the three year service life shall not be less than 150 mcd/lx·m².

All pedestrian crosswalks, bike lane symbols and messages in a proposed bike lane shall attain initial retroreflectivity of not less than 275 mcd/lx·m².

971-6.5.2 Skid Resistance: The surface of the stripes and markings shall provide a minimum skid resistance value of 35 BPN (British Pendulum Number) when tested according to ASTM E 303. Bike lane symbols and pedestrian crosswalks shall provide a minimum skid resistance value of 55 BPN.

971-6.5.3 Durability: Durability is the measured percent of thermoplastic material completely removed from the pavement. The thermoplastic material line loss must not exceed 5.0% at the end of the service life.

971-6.6 Application Properties: Application properties shall meet the requirements of Section 711.

971-6.7 Packing and Labeling: The thermoplastic material shall be packaged in suitable biodegradable or thermo-degradable containers which will not adhere to the product during shipment and storage.

971-7 Permanent Tape Materials for Pavement Stripes and Markings.

971-7.1 General: The materials for pavement stripes and markings shall consist of white or yellow weather-resistant reflective film as specified herein. The markings are divided into two classes: Standard and High Performance. The classes are differentiated by their durability and retroreflectivity. The pigment, glass spheres, and filler shall be well dispersed in the resin. However, the requirements delineated in this Specification and Section 713 shall apply. The material shall be free from all skins, dirt and foreign objects.

971-7.2 Composition: The pavement stripes and markings shall consist of high-quality plastic materials, pigments, and glass spheres uniformly distributed throughout their cross-sectional area, with a reflective layer of spheres embedded in the top surface.

971-7.3 Skid Resistance: The surface of the stripes and markings shall provide a minimum skid resistance value of 35 BPN (British Pendulum Number) when tested according to ASTM E 303. Bike lane symbols and pedestrian crosswalks shall provide a minimum skid resistance value of 55 BPN.

971-7.4 Thickness: The Qualified Products List will list the specified thickness of each approved product.

971-7.5 Durability and Wear Resistance: When properly applied, the material shall provide neat, durable stripes and markings. The materials shall provide a cushioned resilient substrate that reduces sphere crushing and loss. The film shall be weather resistant and, through normal wear, shall show no significant tearing, rollback or other signs of poor adhesion. Durability is the measured percent of pavement marking material completely removed from the pavement. The pavement marking material line loss must not exceed 5.0% of surface area at the end of its service life.

971-7.6 Conformability and Resealing: The stripes and markings shall be capable of conforming to pavement contours, breaks and faults under traffic at pavement temperatures recommended by the manufacturer. The film shall be capable of use for patching worn areas of the same types of film in accordance with the manufacturer's recommendations.

971-7.7 Tensile Strength: The stripes and markings shall have a minimum tensile strength of 40 psi when tested according to ASTM D 638. A rectangular test specimen 6 by 1 by 0.05 minimum thickness shall be tested at a temperature range of 40 to 80°F using a jaw speed of 0.25 inch/min.

971-7.8 Elongation: The stripes and markings shall have a minimum elongation of 25% when tested in accordance with ASTM D 638.

971-7.9 Plastic Pull test: The stripes and markings shall support a dead weight of 4 lb for not less than five minutes at a temperature range of 70 to 80°F. Rectangular test specimen size shall be 6 by 1 by 0.05 inch minimum thickness.

971-7.10 Pigmentation: The pigment shall be selected and blended to provide a material which is white or yellow conforming to standard highway colors through the expected life of the stripes and markings.

971-7.11 Glass Spheres: The stripes and markings shall have glass retention qualities such that, when at room temperature a 2 by 6 inches specimen is bent over a 0.5 inch diameter mandrel axis, a microscopic examination of the area on the mandrel shall show no more than 10% of the spheres with entrapment by the material of less than 40%. The bead adhesion shall be such that spheres are not easily removed when the film surface is scratched firmly with a thumbnail.

971-7.12 Standard Markings: The preformed materials for pavement stripes and markings shall have a service life of three year. The materials shall attain an initial retroreflectance of not less than 300 mcd/lx·m² for white and contrast markings and not less than 250 mcd/lx·m², for yellow markings. The retroreflectance of the white, yellow and contrast pavement markings at the end of the three year service life shall not be less than 150 mcd/lx·m². All pedestrian crosswalks, bike lane symbols and messages in a proposed bike lane shall attain initial retroreflectivity of not less than 275 mcd/lx·m².

971-7.13 High Performance Markings: The preformed materials for pavement stripes and markings shall have a service life of five years. The materials shall attain an initial retroreflectance of not less than 450 mcd/lx·m² for white and contrast markings and not less than 350 mcd/lx·m² for yellow markings. The pavement stripes and markings shall retain a minimum retroreflectance for two years of not less than 300 mcd/lx·m² for white and contrast markings and not less than 250 mcd/lx·m² for yellow markings. The retroreflectance of the white, yellow and contrast pavement markings at the end of the five year service life shall not be less than 150 mcd/lx·m².

971-8 Two Reactive Component Materials For Traffic Stripes And Markings.

971-8.1 General: Two reactive component materials intended for use under this Specification shall include, but not be limited to, epoxies, polyesters and urethanes. Upon curing, these materials shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall have the option of formulating the material according to his own specifications. However, the criteria outlined in this Specification and Section 709 shall apply regardless of the type of formulation used. The material shall be free from all skins, dirt and foreign objects.

971-8.2 Composition:

Component	Test Method	Criteria
TiO ₂ , Type II Rutile (white material only)	ASTM D 476	minimum 10% by weight
Volatile Organic Content, (VOC)	ASTM D 3960	maximum 150 g/L

971-8.3 Physical Requirements: The material shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Adhesion to Concrete	ASTM D 4541	Concrete Failure	-
Hardness	ASTM D 2240	75	-
Abrasion Resistance	971-8.3.2	Pass	-

971-8.3.1 Set To Bear Traffic Time: The material shall set to bear traffic in not more than two minutes.

971-8.3.2 Abrasion Resistance: Test four samples per LOT using a Taber Abrader. The material shall be applied to specimen plates using a drawdown blade having a clearance of 26 mils. Air dry each sample for 30 minutes and bake at 220°F for 18 hours. Clean with a soft brush and weigh each sample. Abrade samples for 1,000 cycles with 500 g weights and CS-10 wheels. Clean the samples with a soft brush and weigh again. The average weight loss for the four plates shall not exceed 50 mg per plate.

971-8.3.3 Retroreflectivity: The white and yellow pavement markings shall attain an initial retroreflectance of not less than 450 mcd/lx·m² and not less than 350 mcd/lx·m², respectively. The retroreflectance of the white and yellow pavement markings at the end of the three year service life shall not be less than 150 mcd/lx·m².

971-8.4 Application Properties: Application properties shall meet the requirements of Section 709.

971-8.5 Packaging and Labeling: The two reactive component material shall be placed in 55 gallon open-end steel drums with a re-usable multi-seal sponge gasket. No more than 50 gallons of material shall be placed in any drum to allow for expansion during transport and storage. Other containers will be used for applicable products. Each container shall designate the color, generic type (e.g. epoxy), user information, manufacturer's name and address, batch number and date of manufacture. Each batch manufactured shall have a unique number. The label shall warn the user of hazards associated with handling or using the material.

971-9 Thermoplastic Material for Audible and Vibratory Traffic Stripes.

971-9.1 General: Upon cooling to normal pavement temperature, the thermoplastic material shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall utilize alkyd based materials only and shall have the option of formulating the material according to his own specifications. However, the requirements delineated in this Specification shall apply regardless of the type of formulation used. The pigment, reflective elements, and filler shall be well dispersed in the resin. The material shall be free from all skins, dirt and foreign objects.

971-9.2 Composition:

Component	Test Method	White	Yellow
Binder		20.0% minimum	20.0% minimum
TiO ₂ , Type II Rutile	ASTM D 476	10.0% minimum	-
Reflective Elements	AASHTO T 250	% minimum per manufacturer	% minimum per manufacturer
Yellow Pigment		-	% minimum per manufacturer

Component	Test Method	White	Yellow
Calcium Carbonate and Inert Filler (-200 mesh sieve)		% minimum per manufacturer	% minimum per manufacturer
Percentages are by weight.			

The alkyd/maleic binder must consist of a mixture of synthetic resins (at least one synthetic resin must be solid at room temperature) and high boiling point plasticizers. At least one-half of the binder composition must be 100% maleic-modified glycerol of rosin and be no less than 15% by weight of the entire material formulation.

971-9.3 Retroreflective Elements: The reflective elements in the intermix shall be determined by the manufacturer and identified for the QPL System.

971-9.4 Physical Requirements: Laboratory samples shall be prepared in accordance with ASTM D 4960 and shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Water Absorption	ASTM D 570	-	0.5%
Softening Point	ASTM D 36	210°F	-
Low Temperature Stress Resistance	AASHTO T 250	Pass	-
Specific Gravity	Water displacement	1.9	2.3
Indentation Resistance	ASTM D 2240* Shore Durometer, A2	65	-
Impact Resistance	ASTM D 256, Method A	1.0 N·m	-
Flash Point	ASTM D 92	475°F	-
*The durometer and panel shall be at 80°F, but not exceeding 90°F with a 4.4 lb load applied. Instrument measurement shall be taken after 15 seconds.			

971-9.4.1 Set To Bear Traffic Time: When applied at the temperatures and thickness specified by Section 701, the baseline material shall set to bear traffic in not more than two minutes. The audible bump shall set to bear traffic in not more than 10 minutes at ambient air temperatures of 80°F or less and in not more than 15 minutes for ambient air temperatures exceeding 80°F.

971-9.4.2 Retroreflectivity: The white and yellow pavement markings shall attain an initial retroreflectance of not less than 300 mcd/lx·m² and not less than 250 mcd/lx·m², respectively. The retroreflectance of the white and yellow pavement markings at the end of the three year service life shall not be less than 150 mcd/lx·m².

971-9.4.3 Durability: Durability is the measured percent of thermoplastic material completely removed from the pavement. The thermoplastic material line loss must not exceed 5.0% at the end of the three year service life. Durability shall also include flattening of the profile or raised portions of the line. The flattening of the profile or raised portion of the line shall not exceed 25% at the end of the three year service life.

971-9.5 Application Properties: Application properties shall meet the requirements of Section 701.

971-9.6 Packing and Labeling: The thermoplastic material shall be packaged in suitable biodegradable or thermo-degradable containers which will not adhere to the product during shipment and storage. The container of thermoplastic material shall weigh approximately 50 lb.

The label shall warn the user that the material shall be heated in the range as recommended by the manufacturer.

971-10 Thermoplastic Material for Wet Weather Pavement Markings.

971-10.1 General: Upon cooling to normal pavement temperature, the thermoplastic material shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall utilize alkyd based materials only and shall have the option of formulating the material according to their specifications. However, the requirements delineated in this specification shall apply regardless of the type of formulation used. The pigment, reflective elements, and filler shall be well dispersed in the resin. The material shall be free from all skins, dirt and foreign objects.

971-10.2 Composition:

Component	Test Method	White	Yellow
Binder		20.0% minimum	20.0% minimum
TiO ₂ , Type II Ructile	ASTM D 476	10.0% minimum	N/A
Reflective Elements (intermix)	ASTM D 1155	% minimum per manufacturer	% minimum per manufacturer
Yellow Pigment		N/A	% minimum per manufacturer
Calcium Carbonate and Inert Filler (-200 mesh sieve)		% minimum per manufacturer	% minimum per manufacturer

Percentages are by weight.

971-10.3 Retroreflective Elements: The reflective elements in the intermix shall be determined by the manufacturer and identified for the QPL System.

971-10.4 Physical Requirements: Laboratory samples shall be prepared in accordance with ASTM D 4960 and shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Water Absorption	ASTM D 570	-	0.5%
Softening Point	ASTM D 36	200°F	-
Low Temperature Stress Resistance	AASHTO T 250	Pass	-
Specific Gravity	Water displacement	1.9	2.3
Indentation Resistance	ASTM D 2240* Shore Durometer, A2	40	-
Impact Resistance	ASTM D 256, Method A	1.0 N·m	-
Flash Point	ASTM D 92	475°F	-

*The durometer and panel shall be at 90°F with a 4.4 lb load applied. Instrument measurement shall be taken after 15 seconds.

971-10.4.1 Set To Bear Traffic Time: When applied at the temperatures and thickness specified by Section 702, the baseline material shall set to bear traffic in not more than two minutes. When the audible bump is required, the bump shall set to bear traffic in not more than 10 minutes at ambient air temperatures of 80°F or less and in not more than 15 minutes for ambient air temperatures exceeding 80°F.

971-10.4.2 Retroreflectivity: The white and yellow pavement markings shall attain an initial dry retroreflectivity of not less than 300 mcd/lx·m² and not less than 250 mcd/lx·m², respectively, and also attain an initial wet recovery retroreflectivity of not less than 150 mcd/lx·m² and not less than 125 mcd/lx·m², respectively. The dry retroreflectance of the white and yellow pavement markings at the end of the three year service life shall not be less than 150 mcd/lx·m², and also the wet recovery retroreflectivity at the end of the service life shall not be less than 75 mcd/lx·m². The retroreflectivity will be determined in accordance with Florida Method FM-5-541 for dry and ASTM E 2177 (Bucket Method) for wet recovery.

971-10.4.3 Durability: Durability is the measured percent of thermoplastic material completely removed from the pavement. The thermoplastic material line loss must not exceed 5.0% at the end of the three year service life. When an audible bump is required, durability shall also include flattening of the profile or raised portions of the line. The flattening of the profile or raised portion of the line shall not exceed 25% at the end of the three year service life.

971-10.5 Application Properties: Application properties shall meet the requirements of Section 702.

971-10.6 Packing and Labeling: The thermoplastic material shall be packaged in suitable biodegradable or thermo-degradable containers which will not adhere to the product during shipment and storage. The container of thermoplastic material shall weigh approximately 50 lb. The label shall warn the user that the material shall be heated in the range as recommended by the manufacturer.

972 RECYCLED PLASTIC PRODUCTS.

(REV 7-8-10) (FA 7-20-10) (1-11)

ARTICLE 972-1 (Page 936) is deleted and the following substituted:

972-1 Description.

Recycled plastic products shall include certified test reports from an approved independent test laboratory that shows the material meets all specifications herein and the manufacturer shall certify the following:

- a. The source of the recycled plastic waste, including the state (FL, GA, etc.) from which the recycled plastic was obtained, and type of waste (consumer or industrial).
- b. The total percent of recycled plastic in the final product.

ARTICLE 972-3 (Page 937) is deleted and the following substituted:

972-3 Materials.

The materials used for recycled plastic products shall consist of a minimum of 70% by weight of recycled plastic. The products shall exhibit good workmanship and shall be free of burns, discoloration, contamination, and other objectionable marks or defects which affect appearance or serviceability. Only chemicals, including fillers and colorants, designed to inhibit photo degradation, biological/biochemical decomposition, insect infestation, or burning will be

permitted to enhance durability. The use of sufficient additives to inhibit photo degradation over the lifetime of the product is required.

ARTICLE 972-4 (Page 937-938) is deleted:

ARTICLE 9-5 (Page 938) is deleted:

ARTICLE 972-6 (Page 939) is deleted and the following substituted:

972-4 Sampling.

One additional product per 1,000, or a minimum of one per order shall be included in the order for Department testing.

**973 STRUCTURAL PLASTICS.
(REV 5-11-09) (FA 6-10-09) (1-10)**

SECTION 973 (Pages 939-944) is deleted and the following substituted:

**SECTION 973
STRUCTURAL PLASTICS**

973-1 Description.

This work covers structural plastic (SP) components including fiberglass structurally reinforced composite piles (CP), fiberglass structurally reinforced composite lumber (SCL) and smaller dimensional fiberglass fiber reinforced composite lumber (FFRCL).

973-2 Product Acceptance.

Use only products listed on the Department's Qualified Products List (QPL). Manufacturers seeking evaluation of products must submit an application in accordance with Section 6 and include independently certified test reports that the material meets the requirements of this Section.

In accordance with Section 6, provide manufacturer's certification that the material meets the requirements of this section.

973-3 Materials.

Use polyethylene made from recycled post consumer or post industrial thermoplastics. Mix the plastic with appropriate colorants, UV inhibitors, hindered amine light stabilizers and antioxidants so that the resulting product meets the material property requirements specified in Tables 1 and 2. Structural Plastic must not corrode, rot, warp, splinter or crack. The skin must be smooth and black in color unless otherwise specified in the Contract Documents. Skin is the

surface material exposed to the atmosphere. Core is the material that surrounds and bonds to the fiberglass reinforcing rods. The use of separate materials for skin and core is at the discretion of each manufacturer; however, if a single material is used, that material must meet the requirements for both skin and core.

Manufacture Structural Plastic as one continuous piece with no joints or splices to the dimensions and tolerances in accordance with Table 3. Interior voids shall not exceed 3/4 inch in diameter. Structural Plastic shall be free of twist and curvature.

Reinforce 10"x10" fiberglass structurally reinforced composite lumber for use in heavy duty and medium duty fender systems with a minimum of four 1 1/2 inch fiberglass reinforcing rods placed in the corners of the section. Reinforce 10"x10" fiberglass structurally reinforced composite lumber for use in light duty fender systems with a minimum of four 1 inch fiberglass reinforcing rods placed in the corners of the section. Reinforce 16" O.D. Components including fiberglass structurally reinforced composite piles for use in heavy duty fender systems with a minimum of sixteen 1 1/2 inch fiberglass reinforcing rods. Reinforce 16" O.D. Components including fiberglass structurally reinforced composite piles for use in medium duty fender systems with a minimum of sixteen 1 inch fiberglass reinforcing rods.

Reinforcing rods must be continuous and offer a minimum flexural strength of 70.0 ksi when tested in accordance with ASTM D 4476 and a minimum compressive strength of 40.0 ksi when tested in accordance with ASTM D 695. Steel reinforcing rods are not permitted.

Reject any sections of structural plastic containing cracks or splits. Also, inspect the ends of the reinforcing rods and reject any sections containing reinforcing rods with voids or cracks.

Add a minimum of 15% (by weight) chopped fiberglass reinforcement to the polyethylene used for fiberglass structurally reinforced composite lumber, a minimum of 5% (by weight) chopped fiberglass reinforcement for components including fiberglass structurally reinforced composite piles and a minimum of 15% (by weight) chopped fiberglass reinforcement for smaller dimensional fiberglass fiber reinforced composite lumber. The fiberglass reinforcement may be reduced when other means of controlling cracking are specified with test results which show long term cracking is nonexistent.

Fiberglass structurally reinforced composite lumber must meet the minimum structural properties listed in Tables 4A and 4B.

Smaller dimensional fiberglass fiber reinforced composite lumber must meet the minimum physical properties listed in Table 5.

Components including fiberglass structurally reinforced composite piles must meet the structural properties listed in Tables 6A and 6B.

Table 1 Plastic Material Properties- CP and SCL			
Density	ASTM D792	Skin	55-63 pcf
Density	ASTM D792	Core	48 – 56 pcf
Water Absorption	ASTM D570	Skin	2 hrs:<1.0% weight increase 24 hrs:<3.0% weight increase
Brittleness	ASTM D746	Skin	Brittleness temperature to be less than -40 deg. C
Impact Resistance	ASTM D256 Method A (Izod)	Skin	Greater than 0.55 ft-lbs/in
Hardness	ASTM D2240	Skin	44-75 (Shore D)

Ultraviolet	ASTM D4329 UVA	Skin	500 hours<10% change in Shore D Durometer Hardness
Abrasion	ASTM D4060	Skin	Weight Loss: <0.02 ozCycles=10,000 Wheel=CS17 Load-2.2 lb
Chemical Resistance	ASTM D756	Skin/Core Sea Water Gasoline No. 2 Diesel	<1.5% weight increase < 9.5% weight increase <6.0% weight increase
Tensile Properties	ASTM D638	Core	Minimum 2200 psi at break
Compressive Modulus	ASTM D695	Core	Minimum 40 ksi
Static Coefficient of Friction	ASTM D1894	Skin	Maximum 0.25, wet
Nail Pull-Out	ASTM D 6117	Skin/Core	Minimum 60 lb

Table 2 Plastic Material Properties FFRCL		
Density	ASTM D 792	50-65 pcf
Impact Resistance	ASTM D256 Method A (Izod)	Greater than 2.0 ft-lbs/in
Hardness	ASTM D2240	44-75 (Shore D)
Ultraviolet	ASTM D4329 (UVA)	500 hours <10% change in Shore D Durometer Hardness
Abrasion	ASTM D4060	Weight Loss: <0.02 oz Cycles = 10,000 Wheel = CS17 Load -2.2 lb
Chemical Resistance	ASTM D756 Sea Water Gasoline No. 2 Diesel	<1.5% weight increase <7.5% weight increase <6.0% weight increase
Tensile Properties	ASTM D638	Minimum 3000 psi at break
Static Coefficient of Friction	ASTM D2394	Minimum 0.25, wet or dry
Nail Pull-Out	ASTM D 6117	Minimum 250 lb
Screw Withdrawal	ASTM D6117	Minimum 400 lb

Table 3 Dimensions and Tolerances		
Structural Plastic	Dimension	Tolerance
Length	Per order (80 ft Maximum)	0/+6 inch
Width – SCL	See Contract Plans	±1/2 inch
Width – FFRCL		±1/4 inch
Height – SCL	See Contract Plans	±1/2 inch
Width – FFRCL		±1/4 inch

Table 3 Dimensions and Tolerances		
Structural Plastic	Dimension	Tolerance
Diameter – CP	See Contract Plans	±1/2 inch
Corner Radius – SCL	1 1/2 inch	±1/2 inch
Corner Radius – FFRCL	1/4 inch	±1/16 inch
Skin Thickness	3/16 inch minimum	n/a
Distance from outer surface to center rebar elements (SCL)	2 inches	±1/4 inch
Distance from outer surface to center rebar elements (CP)	1 3/8 inches	±1/4 inch
Straightness (gap, bend or inside while lying on a flat surface)		<1 1/2 inches per 10 feet

Table 4A Structural Properties for Heavy Duty and Medium Duty SCL	
Member Size	10 inches x 10 inches
Modulus of Elasticity as derived below	521 ksi
Stiffness, E.I.	4.05E+08 lb-inch ²
Yield Stress in Bending	5.8 ksi
Weight	30-37 lb/ft

Table 4B Structural Properties for Light Duty SCL	
Member Size	10 inches x 10 inches
Modulus of Elasticity as derived below	307 ksi
Stiffness, E.I.	2.39E+08 lb-inch ²
Yield Stress in Bending	3.4ksi
Weight	28-35 lb/ft

Table 5 Properties for FFRCL	
Modulus of Elasticity ASTM D 6109	306,000 psi
Flexural Strength ASTM D 6109	2,500 psi
Compressive Strength ASTM D 6108	2200 psi
Compressive Strength Perpendicular to grain ASTM D 6108	700 psi

Table 6A Structural Properties for Heavy Duty CP	
Member Size	16 inch O.D.

Modulus of Elasticity as derived below	1,146 ksi
Stiffness, E.I.	3.69E+09 lb-inch ²
Yield Stress in Bending	9.1 ksi
Weight	68-83 lb/ft

Table 6B Structural Properties for Medium Duty CP	
Member Size	16 inch O.D.
Modulus of Elasticity as derived below	622 ksi
Stiffness, E.I.	2.0E+09 lb-inch ²
Yield Stress in Bending	4.9 ksi
Weight	61-74 lb/ft

The following bending test is required to determine the structural properties listed in Tables 4A, 4B, 6A and 6B. The values stated in these tables are the required minimums.

Determine the modulus of elasticity and yield stress for CP and SCL using the following test. The test specimens shall be full size and of manufacturers standard commercial type. Test the specimens using a three point bend test with the applied load at the center of a simply supported span. The distance between supports shall be 16 times the depth of the specimen with an overhang distance beyond each support equal to 10% of the span length. The loading nose and supports shall have cylindrical surfaces for the SCL tests. In order to minimize excessive indentation at the nose and support locations the radius of the nose and supports shall be at least 0.5". The loading nose and supports for the CP tests shall be a saddle of same diameter as the pile and subtending an angle of 15 degrees and bearing length of 2". The loading shall be applied such that the deflection rate at the load location equals 2 inches/minute +/- 10%.

Yield stress shall be evaluated at maximum P or at P for 1% strain whichever is less. In the event a specimen will neither break nor show true yield point at outer fiber strains up to 3%, the yield stress shall be evaluated using the load P at 1% strain.

$$\text{Yield stress } F_y = (P * L) / (4 * S)$$

Where:

P = Load as stated above

L = Span length

S = Section modulus of gross section

$$\text{Stiffness } EI = (P' * L^3) / (48 * \delta)$$

Where:

P' = Load that is 1/2 P yield

L = Span length

delta = Deflection at the location of load corresponding to P'

$$\text{Modulus of Elasticity } E = EI / I_g$$

Where:

EI = calculated from load deflection curve above

I_g = gross moment of inertia

975 STRUCTURAL COATING SYSTEMS.

(REV 6-9-10) (FA 7-29-10) (1-11)

SECTION 975 (Pages 944–950) is deleted and the following substituted:

SECTION 975 STRUCTURAL COATING MATERIALS

975-1 General Requirements.

975-1.1 General: Upon curing, all coatings and/or coating systems must produce an adherent coating that is visually uniform. The composition of the coating is left to the discretion of the manufacturer but the finished product shall meet all requirements of this Section. All coats of multi-coat systems shall be supplied by the same manufacturer. Multi-component coatings shall be prepackaged in the required ratios.

975-1.2 Environmental Requirements: Coating materials and their waste shall be characterized as non-hazardous as defined by Resource Conservation and Recovery Act (RCRA) Subarticle C rules, Table 1 of 40 CFR 261.24 Toxicity Characteristic.

Volatile Organic Compounds (VOC) shall be less than 3.5 lb/gal when tested in accordance with ASTM D 3960.

975-1.3 Qualified Products List: All polymeric coating materials except the materials in 975-4 shall be listed on the Department's Qualified Products List (QPL). Manufacturers seeking evaluation of their products shall submit (1) the product data sheets, (2) performance test reports from an independent laboratory showing the product meets the requirements of this section, (3) a Product MSDS or performance test reports showing percent weight compositional analysis including Chemical Abstract Number, ACGIH time weighted average and ceiling exposure limits for all components, lower and upper explosive limits, flash point, boiling point, amount of volatile organic compounds by weight, and specific gravity for each component of the coating system, and (4) a QPL application in accordance with Section 6.

975-1.4 Packaging and Labeling: Materials shall be shipped in containers legibly marked with application instructions, lot number, batch number, date of manufacture, shelf life, and Department QPL number. Each lot or batch manufactured must have a unique number.

975-2 Structural Steel Coating Systems.

975-2.1 General: Structural steel coatings shall meet the application requirements of Section 560.

975-2.2 Performance Requirements: Outdoor exposure testing will be performed by the Department. Prepare four composite and four flat-scribed test panels in accordance with AASHTO R-31 (Federal Standard 595B, Shade X6134 or X4062) and submit to the State Materials Office. Also submit 1-quart wet samples of each component of each coating incorporated in the system being evaluated. Panels will be exposed at the Department's outdoor test site in accordance with ASTM G7. All coatings, regardless of color, shall meet the requirements below.

Laboratory Testing		
Property	Test Method	Requirement
Slip Coefficient	AASHTO R-31	Min. Class B (primer only)
Salt Fog Resistance	AASHTO R-31	Blister Size = 10 Average Rust Creep at the Scribe ≤ 0.1 inches
Cyclic Weathering Resistance	AASHTO R-31	Blister Size = 10 Average Rust Creep at the Scribe ≤ 0.2 inches, Color Retention $\Delta E \leq 8$, Gloss loss less than 30 units
Abrasion Resistance	AASHTO R-31	Wear Index ≤ 2.7 mg/cycle
Adhesion	AASHTO R-31	Avg. system tensile strength ≥ 800 psi
Freeze Thaw Stability	AASHTO R-31	Avg. tensile strength ≥ 800 psi
Coatings Identification	Fourier Transform Infrared Spectroscopy	IR scan (2.5 to 15 μ m) for each base, catalyst, and mixed coating.
Impact Resistance	ASTM D 2794	Greater than 25 inch/lbs, 1/2" impact, intrusion
Flexibility	AASHTO R-31, ASTM D 522, 1 inch cylindrical mandrel	No cracking
Outdoor Testing		
Property	Test Method	Requirement
Rusting	ASTM D 610 ASTM D 1654 (scribed) ASTM D 1654 (un-scribed)	≥ 9 after 5 years ≥ 9 after 5 years ≥ 9 after 5 years
Blistering	ASTM D 714	10 after 5 years
Adhesion	ASTM D 4541; annex A4	≥ 800 psi (un-scribed area) after 5 years
Color Retention	ASTM D 2244	$\Delta E \leq 8$ after 2 years
Gloss	ASTM D 523	≤ 30 gloss units after 2 years

975-2.3 Structural Steel Coating Systems for New Structures.

975-2.3.1 High Performance Coating Systems (Color Pigmented):

975-2.3.1.1 Prime Coat: Zinc dust pigment shall be a minimum of Type II in accordance with ASTM D 520. Inorganic zinc rich primers shall meet the requirements of the Society for Protective Coatings (SSPC) Paint 20, Type I, Level 2.

975-2.3.1.2 Intermediate Coat: Intermediate coatings, when required by the manufacturer, shall be a component of the full coating system.

975-2.3.1.3 Finish Coat: The finish coat shall provide the color and gloss required for the completed coating system. A finish coat may be comprised of a single pigmented coat or a pigmented coat with a clear coat. The clear coat shall contain a dissipating colorant. The dissipating colorant shall be visible for a minimum of 12 hours after application and shall completely dissipate within 96 hours after application.

975-2.3.2 Inorganic Zinc Coating System: Zinc dust pigment shall be a minimum of Type II in accordance with ASTM D 520. Inorganic zinc rich primers shall meet the requirements of SSPC Paint 20, Type I, Level 2. The performance requirements for gloss and color retention are not applicable.

975-2.3.3 Interior Box Girder Coating System:

975-2.3.3.1 Prime Coat: Inorganic zinc dust pigment shall be a minimum of Type II in accordance with ASTM D 520. Inorganic zinc rich primers shall meet the requirements of SSPC Paint 20, Type I, Level 2.

975-2.3.3.2 Finish Coat: The finish coat shall be one coat of white polyamide or cycloaliphatic amine epoxy coating. The performance requirements for gloss and color retention are not applicable.

975-2.4 Structural Steel Coating Systems for Existing Structures.

975-2.4.1 Prime Coat: Zinc dust pigment shall be a minimum of Type II in accordance with ASTM D 520. Organic zinc rich primers shall meet the requirements SSPC Paint 20, Type II, Level 2.

975-2.4.2 Intermediate Coat: Intermediate coatings, when required by the manufacturer, shall be a component of the full coating system.

975-2.4.3 Finish Coat: Finish coating shall provide the color and gloss required for the completed coating system. A finish coat may be comprised of a single pigmented coating or a pigmented coating with a clear coat. The clear coat shall contain a dissipating colorant. The dissipating colorant shall be visible for a minimum of 12 hours after application and shall completely dissipate within 96 hours after application.

975-3 Galvanized Steel Coating System.

Coatings applied over galvanized steel shall meet the outdoor exposure requirements of 975-2.2 with the exception that test panels shall be galvanized in accordance with ASTM A 123 prior to application of subsequent coatings.

Coatings applied over galvanized steel strain poles, mast arms, and monotube assemblies shall meet the requirements of Section 649 and 975-4.

975-4 Painting Strain Poles, Mast Arms and Monotube Assemblies.

Paint systems used on galvanized steel strain poles, galvanized steel mast arms and galvanized steel monotube assemblies shall meet the color requirements as specified in the Contract Documents and shall exhibit no loss of adhesion or loss of color greater than 8ΔEs for five years after final acceptance as specified in 5-11. A galvanized steel strain pole, mast arm or monotube assembly that exhibits a cumulative surface area of delamination in excess of 100 square inches will constitute an adhesion failure. Delamination shall be defined as any area of

exposed metal surface subsequent to hand tool cleaning in accordance with SSPC-SP2. A change in the coating color in excess of 8ΔEs per the CIE L*a*b* 1976 will constitute a color retention failure. The Department will measure the CIE 1976 color chromaticity coordinates for the color of the top coat of the two sample coupons provided with a BYK-Gardner Handicolor colorimeter using D65 illuminant and 2 degree geometry settings. The Department-measured L*a*b* chromaticity coordinates shall define the initial color and will be used for resolution of color retention failures and the resolution of color retention disputes. All paint systems shall possess physical properties and handling characteristics that are compatible with the application requirements of Section 649. Materials shall be specifically intended for use over galvanized steel.

975-5 Elastomeric Coatings.

975-5.1 General: Use an elastomeric coating system to provide a waterproof barrier over post-tensioning anchorages or other areas designated in the plans. The components of the coating system shall be supplied by a single manufacturer and sold as a waterproof coating system. The surface preparation and application of the coating system shall be performed in strict accordance with the manufacturer's specifications.

975-5.2 Physical Properties: The use of an epoxy prime coat is dependent upon the requirements of the manufacturer's waterproofing system. The polyurethane chemistry may be either waterborne aromatic (moisture-curing) or aromatic (moisture-sensitive). The minimum thickness of the system shall not be less than 30 mils. The elastomeric coating shall meet the following requirements:

Property	Test Method	Requirement
Hardness, Shore A	ASTM D 2240	Between 60 and 90
Tensile Strength	ASTM D 412	≥750 psi
Elongation	ASTM D 412	≥400%
Tear Strength	ASTM C 957	>70 pli
Abrasion Resistance H-18 wheels 1,000 gm/wheel	ASTM C 957	≤350 mg loss / 1,000 revs.
Crack Bridging 1,000 Cycles	ASTM C 957	System Passes
Elongation Recovery	ASTM C 957	≥94%

975-5.3 System Modifications for Use on Bridge Substructure: Supply the elastomeric coating system with a 100% acrylic aliphatic polyurethane top coating.

975-6 Class 5 Applied Finish Coatings.

975-6.1 General: All coatings shall possess physical properties and handling characteristics compatible with the application requirements of Section 400. Unless otherwise specified, the color of the finish coat shall meet Federal Color Standard No. 595B, Table VIII, Shade No. 36622.

975-6.2 Coating Requirements: Use 4 inch by 8 inch (except as required below) fiber cement test panels with a mass of 7 to 9 pounds per square foot of surface area to perform the laboratory tests. Coating performance shall meet the following requirements:

Laboratory Testing

Property	Test Method	Requirement
Resistance to Wind Driven Rain	ASTM D 6904	No visible water leaks, and if the rear face of the block is damp, the average gain in weight of the three 8 by 16 by 2 inch blocks must be less than 0.2 lb.
Freeze thaw resistance	AASHTO R-31	No disbondment
Water Vapor Transmission	ASTM D 1653; Method B, Condition C	WVT \geq 10 perms
Abrasion Resistance	ASTM D 968, 3,000 liters of sand	No loss of coating thickness ASTM D 6132
Salt Spray (fog) resistance	ASTM B 117, 2,000 hours	No disbondment
Fluorescent UV-Condensation Exposure	ASTM D 4587, 2000 hours, 4 hours UV, 4 hours condensation	No blistering (ASTM D 714), cracking (visual), or delamination (visual). chalking (ASTM D 4214 Method D) rating no less than 8.
Fungal Resistance	ASTM D 3273	Rating of 10, ASTM D 3274

Submit four fiber cement test panels and a 1 quart wet sample of each component of each coating incorporated in the total system being evaluated. Prepare test panels by applying the finished coating at a rate of 50 plus or minus 10 square feet per gallon. In addition, completely seal the corners of all test panels with a high build epoxy or equivalent to prevent moisture ingress at corners and cut edges.

975-7 Anti-Graffiti Coating Materials.

975-7.1 General Requirements: Anti-graffiti coatings intended for use under this specification shall be of a composition capable of preventing the adhesion of graffiti and facilitating the removal of graffiti. All anti-graffiti coatings shall possess the physical and handling characteristics that are compatible with the requirements of Section 563.

Anti-graffiti coatings shall contain less than 5.0 lb/gal volatile organic compounds (VOC) as defined by 40 CFR Part 59, Subpart D, and evaluated as per ASTM D 3960.

The manufacturer will supply the following additional information:

- a. Cleaning instructions and materials, as applicable. Surfaces must be cleanable with nonproprietary cleaners as defined in ASTM D 6578.
- b. Sacrificial Coating Removal instructions, as applicable.
- c. Recommended base coat, as applicable.
- d. Identification of coating system and type, as applicable.
- e. Clear coats must contain a UV degradable color for inspection purposes. UV degradable color must dissipate in a reasonable time period to allow inspection but not detract from visual impact of the structure.

975-7.2 Laboratory Requirements: Use flat test panels prepared in accordance with AASHTO R-31.

Laboratory Testing- Non-Sacrificial

Property	Test Method	Requirement
Cyclic Weather Testing	AASHTO R-31	No blistering, cracking, checking, chalking, or delamination; color change less than 3 Delta E CIE LAB units; Retention of 60° Gloss ratio ≥ 0.80
Taber Abrasion	ASTM D4060, CS17, 1,000 g of sand	60 g maximum weight loss
Impact Resistance	ASTM D2794	Minimum of 30 inch-pounds, 1/2" impact, intrusion
Graffiti Resistance	ASTM D6578, Use identified marking materials; initial and recleanability; and after exposure initial and recleanability	Cleanability Level 8, 9, or 10.
MEK Double Rub	ASTM D 4752; 50 rubs	No coating wear through (4 minimum rating)
Fluid Resistance	ASTM D1308- spot; Paint Thinner, Gasoline	No blistering, discoloration, softening or adhesion loss.

Laboratory Testing- Sacrificial		
Property	Test Method	Requirement
Cyclic Weather Testing	AASHTO R-31, no salt fog, 95 degrees Fahrenheit, 0%- 90% Relative Humidity, 500 hours, alternating RH every 100 hours	No melting or disbondment
Sacrificial Coating removability	Per Manufacturer's specifications: 6 months exposure at FDOT test site	Complete removal of material from substrate

981 TURF MATERIALS.

(REV 7-1-10) (FA 8-16-10) (1-11)

ARTICLE 981-1 (Page 951) is deleted and the following substituted:

981-1 General.

The types of seed and sod will be specified in the Contract Documents. All seed and sod shall meet the requirements of the Florida Department of Agriculture and Consumer Services and all applicable state laws, and shall be approved by the Engineer before installation.

All seed, sod and mulch shall be free of noxious weeds and exotic pest plants, plant parts or seed listed in the current Category I "List of Invasive Species" from the Florida Exotic Pest Plant Council (FLEPPC, www.fleppc.org). Any plant officially listed as being noxious or undesirable by any Federal Agency, any agency of the State of Florida or any local jurisdiction in which the project is being constructed shall not be used. Any such noxious or invasive plant or

plant part found to be delivered in seed, sod or mulch will be removed by the Contractor at his expense and in accordance with the law.

All materials shall meet plant quarantine and certification entry requirements of Florida Department of Agriculture & Consumer Services, Division of Plant Industry Rules.

ARTICLE 981-4 (Page 952) is deleted and the following substituted:

981-4 Mulch.

The mulch material shall be compost meeting the requirements of Section 987, hardwood barks, shavings or chips; or inorganic mulch materials as approved by the Engineer; or hydraulically applied wood fiber mulch or bonded fiber matrix (BFM) for the establishment of turf material.

ARTICLE 981-5 (Page 952) is deleted:

**987 PREPARED SOIL LAYER MATERIALS
(REV 1-15-10) (FA 2-17-10) (7-10)**

ARTICLE 987-1 (Page 955) is deleted and the following substituted:

987-1 Description.

All material shall be suitable for plant growth. The organic matter content of the prepared soil layer after mixing shall be a minimum of 2.5%, a maximum of 10%, in accordance with FM 1-T-267 and have a pH value of 4.5 or greater and less than or equal to 8.5 as determined in accordance with FM 5-550. The organic matter content shall be created using any of the following materials.

**990 TEMPORARY TRAFFIC CONTROL DEVICES AND MATERIALS.
(REV 8-10-10) (FA 8-12-10) (1-11)**

ARTICLE 990-2 (Page 956) is deleted and the following substituted:

990-2 Retroreflective Sheeting for Temporary Traffic Control Devices.

990-2.1 Qualified Products List: Sheeting for use on Temporary Traffic Control Devices shall be one of the products listed on the Qualified Products List (QPL). Manufacturers seeking evaluation of their product shall submit an application in accordance with Section 6.

990-2.1.1 Sign Panels, Bands for Tubular Markers, Vertical Panels, Barricades and other Devices: Sign Panels, Bands for Tubular Markers, Vertical Panels, Barricades and other Devices shall meet the requirements of ASTM D 4956 for Type III or higher retroreflective sheeting materials identified in Section 994 except for mesh signs shall meet the color, daytime luminance and nonreflective property requirements of Section 994,

Type VI.

990-2.1.2 Collars for Traffic Cones: Collars for Traffic Cones shall meet the requirements of ASTM D 4956 Type VI.

990-2.1.3 Drums: Drums shall meet the requirements of ASTM D 4956 for Type III or higher retroreflective sheeting materials identified in Section 994 including Supplementary requirements for Reboundable Sheeting.

SUBARTICLE 990-3.1 (Page 956) is deleted and the following substituted:

990-3.1 General: All portable devices shall meet the physical display and operational requirements of the MUTCD and be listed on the Approved Products List (APL). Manufacturers seeking approval of their portable devices shall provide a working sample to be evaluated by the Department that meets all requirements specified herein.

SUBARTICLE 990-3.1.4 (Pages 958 – 959) is deleted and the following substituted:

990-3.1.4 Support Chassis: The Support Chassis shall meet the following:

(a) The support chassis shall be self-contained and self-supporting without the use of additional equipment or tools.

(b) Both trailer and truck-mounted units are allowed for arrow panels. Trailer mounted units are required for changeable message signs, regulatory signs and radar speed display units.

(1) Trailer mounted unit:

(a) The sign, power supply unit and all support systems shall be mounted on a wheeled trailer.

(b) The trailer shall be equipped with class-A lights, using a plug adaptor.

(c) The trailer shall be equipped with adjustable outrigger leveling pads, one on each of the four frame corners.

(d) The trailer shall be designed to be set up at the site with its own chassis and outriggers, without being hitched to a vehicle.

(e) The trailer shall be equipped with fenders over the tires and shall be made from heavy-duty material sufficient to allow a person to stand and operate or perform maintenance on the unit.

(f) The trailer shall meet all equipment specifications set forth in Chapter 316 of the Florida Statutes, and by such rule, regulation or code that may be adopted by the Department of Highway Safety and Motor Vehicles.

(g) The trailers should be delineated on a permanent basis by affixing retroreflective material, known as conspicuity material, in a continuous line on the face of the trailer as seen by oncoming road users.

(2) Truck mounted unit:

(a) The truck-mounted assembly shall be designed to fit on a 1/2 ton or greater duty truck.

(b) The unit shall be self-contained with its own power supply, controls, raising and lowering device and shall be capable of being operated by one person.

(c) The unit shall be secured in the vehicle for normal operation.

SUBARTICLE 990-4.1 (Page 962) is deleted and the following substituted:

990-4.1 Composition: Removable Tape shall be one of the products listed on the QPL. The pavement stripes and markings shall consist of high quality plastic materials, pigments, and glass spheres or other retroreflective materials uniformly distributed throughout their cross-sectional area, with a reflective layer of spheres or other retroreflective material embedded in the top surface. No foil type materials shall be allowed.

ARTICLE 990-4.10 (Page 963) is deleted and is replaced by the following:

990-4.10 Color: Meet the requirements of 971-1.6.

ARTICLE 990-4 (Pages 962 and 963) is expanded by the following:

990-4.11 Removability: Ensure that the manufacturer shows documented reports that the removable tape is capable of being removed intact or in substantially large strips after being in place for a minimum of 90 days and under an average daily traffic count per lane of at least 5,000 vehicles per day.

ARTICLE 990-5 (of the Supplemental Specifications) is deleted and the following substituted:

990-5 Temporary Retroreflective Pavement Markers.

Temporary Retroreflective Pavement Markers (RPM's) shall meet the requirement of 970-1.2.1, be one of the products listed on the QPL and be certified as meeting the following:

(a) Composition: Use markers made of plastic, ceramic or other durable materials. Markers with studs or mechanical attachments will not be allowed.

(b) Dimensions: Marker minimum and maximum surface dimensions is based on an x and y axis where the y dimension is the axis parallel to the centerline and the x axis is 90 degrees to y. Class E markers shall be 4 inch (W) by 2 inch (H) by 1 inch (D).

The x and y dimension of Class D markers shall be a maximum of 5 inches. The x dimension shall be a minimum of 4 inches and the minimum y dimension will be 2.25 inches.

The maximum installed height of Class D markers shall be 1 inch. The maximum installed height of Class E markers shall be 2 inches. Use Class D markers having a minimum reflective face surface of 0.35 square inches. Use Class E markers having a minimum reflective surface area of 1 square inch.

The marker's reflective face shall be completely visible and above the pavement surface after installation, measured from a line even with the pavement perpendicular to the face of the marker.

(c) Optical Performance: Ensure that the specific intensity of each white reflecting surface at 0.2 degrees observation angle shall be at least the following when the incident light is parallel to the base of the marker:

Horizontal Entrance Angle	Specific Intensity
0 deg.	3
20 deg.	1.2

For yellow reflectors, the specific intensity shall be 60% of the value for white.

For red reflectors, the specific intensity shall be 25% of the value for white. Reflectivity of all RPM's shall not be less than 0.2 Specific Intensity (SI) any time after installation.

(d) Strength requirements: Markers shall support a load of 5,000 pounds. Three markers per lot or shipment will be randomly tested as follows:

Position the marker base down, between the flat, parallel 0.5 inch steel plates of a compression testing machine. Place on top of the marker, a flat piece of 60 (Shore A) durometer rubber, 6 inch by 6 inch by 0.37 inch, centered on the marker. Apply the compressive load through the rubber to the top of the marker at a rate of 0.1 inches per minute.

Either cracking or significant deformation of the marker at any load less than 5,000 pounds will constitute failure.

(e) Adhesion: Use bituminous adhesive materials for bonding the markers to the pavement that meet the requirements of Section 970 and are listed on the QPL.

(f) Removability: Ensure that the pavement marker is removable from asphalt pavement and portland cement concrete pavement intact or in substantially large pieces, either manually or by mechanical devices at temperatures above 40°F, and without the use of heat, grinding or blasting.

SUBARTICLE 990-6-1 (Pages 964 – 965) is deleted and the following substituted:

990-6.1 Design and Installation: Meet the following requirements:

(a) Glare screen units shall be manufactured in lengths such that when installed the joint between any one modular unit will not span barrier sections. Color shall be green, similar to Federal Color Standard 595-34227.

(b) Blades, rails and/or posts shall be manufactured from polyethylene, fiberglass, plastic, polyester or polystyrene, and be ultraviolet stabilized and inert to all normal atmospheric conditions and temperature ranges found in Florida.

(c) For paddle type designs, the blade width shall not be more than 9 inches. Blades or screen for individual or modular systems shall be 24 to 30 inches high and capable of being locked down at an angle and spacing to provide a cut-off angle not less than 20 degrees.

(d) For glare screen mounted on temporary barrier wall, a strip (6 by 12 inches) of reflective sheeting as specified in 994-2 shall be placed on a panel, centered in each barrier

section (at a spacing not to exceed 15 feet) and positioned in such a manner as to permit total right angle observation by parallel traffic. When glare screen is utilized on temporary concrete barriers, warning lights will not be required.

(e) Prior to approval an impact test shall be performed by the manufacturer to verify the safety performance of the proposed system. The minimum impact strength of the posts, blades, rail and the barrier attachment design shall be sufficient to prevent the unit from separating from the barrier when impacted by a 3 inches outside diameter steel pipe traveling at 30 mph and impacting mid-height on the glare screen assembly.

(f) All hardware shall be galvanized in accordance with ASTM A-123 or stainless steel in accordance with AISI 302/305.

Alternative designs for temporary glare screen may be submitted as a Cost Savings Initiative Proposal in accordance with 4-3.9.

SUBARTICLE 990-7.1 (Pages 965 and 966) is deleted and the following substituted:

990-7.1 General: Temporary Traffic Control Signals shall be one of the products listed on the APL. Meet the physical display and operational requirements of conventional traffic signal described in the MUTCD for portable traffic signals. The standard includes but is not limited to the following:

(a) Use signal heads having three 12 inch vehicular signal indications (Red, Yellow and Green). Ensure there are two signal heads for each direction of traffic.

(b) The traffic signal heads on this device will be approved by the Department.

(c) Department approved lighting sources will be installed in each section in accordance with the manufacturer's permanent directional marking(s), that is, an "Up Arrow", the word "UP" or "TOP," for correct indexing and orientation within a signal housing.

(d) The masts supporting the traffic signal heads will be manufactured with the lowest point of the vehicular signal head as follows:

(1) Eight feet above finished grade at the point of their installation for "pedestal" type application or

(2) Seventeen to 19 feet above pavement grade at the center of roadway for "overhead" type application.

(e) The yellow clearance interval will be programmed three seconds or more. Under no condition can the yellow clearance interval be manually controlled. It must be timed internally by the controller as per Department specifications.

(f) The green interval must display a minimum of five seconds before being advanced to the yellow clearance interval.

(g) The controller will allow for a variable all red clearance interval from 0 to 999 seconds.

(h) Portable traffic control signals will be either manually controlled or traffic actuated. Indicator lights for monitoring the signal operation of each approach will be supplied and visible from within the work zone area.

(i) When the portable traffic control signals are radio actuated the following will apply:

(1) The transmitter will be FCC Type accepted and not exceed 1 watt output per FCC, Part 90.17. The manufacturer must comply with all "Specific limitations" noted in FCC Part 90.17.

(2) The Controller will force the traffic signal to display red toward the traffic approach in case of radio failure or interference.

(j) The trailer and supports will be painted construction/maintenance orange enamel in accordance with the MUTCD color.

(k) The device will meet NEMA environmental standard. The test report certified by an independent laboratory will be provided.

(l) Ensure the certification number is engraved or labeled permanently on equipment.

(m) Ensure the device has an external, visible, water resistant label with the following information: "Certification of this device by the Florida Department of Transportation allows for its use in Construction Zones Only."

SECTION 990 (Pages 956-966) is expanded by the following new Article:

990-8 Work Zone Signs.

Provide steel flanged U-channel or Square Tube steel meeting the mechanical requirements of ASTM A 499, Grade 60. For each U-channel or Square Tube, punch or drill 3/8 inch diameter holes on 1 inch centers through the center of the post, starting approximately 1 inch from the top and extending the full length of the post. Ensure that the weight per foot of a particular manufacturer's post size does not vary more than $\pm 3 \frac{1}{2}\%$ of its specified weight per foot. Taper the bottom end of the post for easier installation. Machine straighten the U-channel to a tolerance of 0.4% of the length. Use only non-corrosive metal, aluminum, or galvanized steel attachment hardware. Work zone sign systems shall be one of the products listed on the QPL.

SECTION 990 (Pages 956 -966) is expanded by the following new Articles:

990-9 Temporary Raised Rumble Strips:

990-9.1 General: Temporary Raised Rumble Strips shall be one of the products listed on the QPL. Meet the physical display and operational requirements in the MUTCD for Temporary Raised Rumble Strips. The Temporary Raised Rumble Strip may be either a removable polymer striping tape type or a molded engineered polymer material type as described below:

990-9.1.1 Removable Polymer Striping Tape:

Characteristic	Requirement
Composition:	Removable Polymer Striping Tape with pre-applied adhesive
Color:	White, Black or Orange
Cross-section:	0.25 in. to 0.50 in. (height) x 4 in. (wide)

990-9.1.2 Molded Engineered Polymer Material:

Characteristic	Requirement
Composition:	Molded Engineered Polymer Material
Weight	Internally ballasted to provide proper weight to maintain position in use without the use of adhesives or mechanical fasteners
Color:	White, Black or Orange

Shape	Beveled on the leading edge
Cross-section:	0.625 in. to 0.875 in. (height) x 12 in. (wide)

990-10 Automated Flagger Assistance Devices (AFAD): 990-10.1 General: AFAD's shall be one of the products listed on the APL. Meet the physical display and operational requirements in the MUTCD for the AFAD as well as the detailed requirements below.

990-10.1.1 Stop/Slow Automated Flagger Assistance Devices: Provide a Stop/Slow AFAD including a Stop/Slow sign that alternately displays the stop face and the slow face of a Stop/Slow paddle without the need for a flagger in the immediate vicinity of the AFAD or on the roadway.

Ensure that the Stop/Slow AFAD includes a gate arm that descends to a down position across the approach lane of traffic when the stop face is displayed and then ascends to an upright position when the slow face is displayed.

Ensure the Gate arm is fully retroreflectorized on both sides, with vertical alternating red and white stripes at 16-inch intervals measured horizontally in accordance with the MUTCD. When the arm is in the down position blocking the approach lane:

- A. The minimum vertical aspect of the arm and sheeting shall be 2 inches; and,
- B. The end of the arm shall reach at least to the center of the lane being controlled.

990-10.1.2 Red/Yellow Lens Automated Flagger Assistance Devices: Provide a Red/Yellow Lens AFAD that alternately displays a steadily illuminated circular red lens and a flashing circular yellow lens to control traffic without the need for a flagger in the immediate vicinity of the AFAD or on the roadway.

Ensure that the Red/Yellow Lens AFAD includes a gate arm that descends to a down position across the approach lane of traffic when the steady circular red lens is illuminated and then ascends to an upright position when the flashing circular yellow lens is illuminated.

Ensure that the gate arm is fully retroreflectorized on both sides, with vertical alternating red and white stripes at 16-inch intervals measured horizontally in accordance with the MUTCD. When the arm is in the down position blocking the approach lane:

- A. The minimum vertical aspect of the arm and sheeting shall be 2 inches; and,
- B. The end of the arm shall reach at least to the center of the lane being controlled.

Do not provide a change interval between the display of the steady circular red indication and the display of the flashing circular yellow indication. Provide a steady illuminated circular yellow indication, with at least a 5 second duration, between the transition from flashing circular yellow indication and the display of the steady circular red indication. The Engineer may approve a different duration, provided it falls within the range recommended by the MUTCD.

993 OBJECT MARKERS AND DELINEATORS.
(REV 7-8-10) (FA 7-16-10) (1-11)

SUBARTICLE 993-1.4 (Page 975) is deleted and the following substituted:

993-1.4 Posts: The marker posts shall be of steel or aluminum as shown in the Design Standards or plans. Steel posts shall be 2.5 lb/ft. flanged U-Channel . The U-channel posts shall meet the mechanical requirements of ASTM A 499, Grade 60. Provide U-channel posts that have been galvanized after fabrication in accordance with ASTM A 123 and have a smooth uniform finish free from defects affecting strength, durability and appearance. For each U-channel, punch or drill 3/8 inch diameter holes on 1 inch centers through the center of the post, starting approximately 1 inch from the top and extending the full length of the post. Punching or drilling operations shall be completed prior to galvanization. The weight per foot of a manufacturer's U-channel size shall not vary more than plus or minus 3.5% of its specified weight per foot. Machine-straighten the U-channel to a tolerance of 0.4% of the length. U-channel posts shall be listed on the QPL. Round aluminum posts shall meet the requirements of Index 11860.

Use attachment hardware (nuts, bolts, clamps, brackets, braces, etc.) of aluminum or galvanized steel.

SUBARTICLE 993-2-2 (Page 975) is deleted and the following substituted:

993-2.2 Flexible Post Delineators:

993-2.2.1 Dimensions: The post shall have a minimum width of 3 inches facing traffic and of such length to generally provide a height of 48 inches above the pavement surface.

993-2.2.2 Color: The post shall be opaque white. The yellowness index shall not exceed 12 when tested in accordance with ASTM D 1925 or ASTM E 313. The daylight 45 degree, 0 degree luminous directional reflectance shall be a minimum of 70 when tested in accordance with ASTM E 1347.

993- 2.2.3 Retroreflective Sheeting: The reflective sheeting shall be Types III, IV, V or VII and meet the requirements of Section 994. The reflective sheeting shall have a minimum width of 3 inches and have a minimum area of 30 square inches.

993-2.2.4 Impact Performance: Posts shall be tested and evaluated according to the National Testing Product Evaluation Program (NTPEP) Project Work Plan for Field Evaluation of Flexible Surface Mounted Delineator Posts. A temperature of 65°F or greater may be used in lieu of the NTPEP temperature requirements. Posts shall be capable of returning to a vertical position plus or minus 5 degrees with no delaminating, and one post may list no more than 10 degrees. No post shall split, crack, break, or separate from base.

SUBARTICLE 993-2.3.1 (Page 975) is deleted and the following substituted:

993-2.3.1 Posts: The posts shall meet the requirements of 993-1.4, except the steel delineator post shall be 1.1 lb/ft.

994 RETROREFLECTIVE AND NONREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES.

(REV 2-8-10) (FA 2-10-10) (7-10)

SECTION 994 (PAGES 977 – 980) is deleted and the following substituted:

SECTION 994 RETROREFLECTIVE AND NONREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES

994-1 Description.

994-1.1 General: This Section specifies the requirements for retroreflective and nonreflective sheeting materials, transparent and opaque process inks for retroreflective sheeting materials and film overlays for traffic control devices.

994-1.2 Classification: Retroreflective sheeting material Types III, IV, V, and VI shall be classified in accordance with ASTM D-4956. In addition, a special classification, Type VII (Special) is added for super high intensity retroreflective sheeting. This special classification shall include materials classified as Type VIII and above in accordance with ASTM D-4956.

994-1.3 Qualified Products List: All sheeting, process inks and film overlay materials shall be listed on the Qualified Products List (QPL). Manufacturers seeking evaluation of their products shall submit product data sheets, performance test reports from an independent laboratory showing the product meets the requirements of this section, and a QPL application in accordance with Section 6. Information on the QPL application must include the product colors included in the application, classification, adhesive backing class, and liner type. Information on the QPL application for process inks and film overlay products must also include the compatible reflective sheeting material.

994-2 Materials.

Sheeting shall meet the requirements of Types III, IV, V, VI in ASTM D-4956 or Type VII (Special) and fluorescent pink listed below in accordance with their approved usage.

994-3 Performance Requirements.

994-3.1 General: Sheeting, process inks and film overlay materials shall be tested in accordance with, and meet all the performance requirements of ASTM D-4956, including Supplemental Requirement S2, Reboundable Sheeting Requirements, except as amended in this Section. Classification Type VII (Special) shall be tested in accordance with, and meet the performance requirements of ASTM D-4956 Type VIII, except as amended in this Section. For performance requirements that are color dependant, each color included in the QPL application must be tested and meet the requirements identified in ASTM D-4956 or this Section as applicable. Process inks and film overlay materials shall be applied to reflective sheeting in accordance with Section 994-4 for testing.

994-3.2 Retroreflective Intensity: The retroreflective sheeting shall meet the minimum initial requirements as stated for 0.2 degree and 0.5 degree observation angles in ASTM D-4956. Type VI fluorescent pink sheeting and Type VII (Special) sheeting shall meet the minimum retroreflectivity requirements listed below.

Type VII (Special) Sheeting										
Minimum Coefficient of Retroreflection (cd/foot-candle·ft ²)(cd/fc·ft ²)										
Observation/Entrance Angle (degree)	White	Yellow	Red	Orange	Blue	Green	Brown	Fluorescent Orange	Fluorescent Yellow	Fluorescent Yellow/Green
0.2/-4	380	304	95	250	19	38	19	180	220	360
0.5/-4	250	195	55	100	12	25	8	60	145	235
0.2/30	220	176	48	110	11	22	9	85	125	205
0.5/30	135	105	30	50	7	14	3	33	75	125

Type VI Sheeting	
Minimum Coefficient of Retroreflection (cd/foot-candle·ft ²)(cd/fc·ft ²)	
Observation/Entrance Angle (degree)	Fluorescent Pink
0.2/-4	160
0.5/-4	100
0.2/30	100
0.5/30	40

994-3.3 Color: The fluorescent pink initial color shall meet the following x, y chromaticity coordinates:

Fluorescent Pink	1	2	3	4
x	.450	.590	.644	.536
y	.270	.350	.290	.230

Fluorescent pink sheeting shall have a minimum luminance factor of 25.

994-3.4 Outdoor Weathering: Outdoor weathering exposure of sign sheeting materials shall be in accordance with, and meet the requirements of ASTM D-4956 for each product color and classification and conducted at an exposure location meeting the Tropical Summer Rain Climate Type (Miami, Florida or equivalent). Outdoor weathering is not required for Type VI fluorescent pink and fluorescent yellow.

994-4 Direct and Reverse Screen Processing.

The transparent and opaque process inks furnished for direct and reverse screen processing shall be of a type and quality formulated for retroreflective sheeting materials as listed on the QPL and applied in accordance with the manufacturer's instruction. Screen processing in accordance with the techniques and procedures recommended by the manufacturer shall produce a uniform legend of continuous stroke width of either transparent or opaque ink, with sharply defined edges and without blemishes on the sign background that will affect the intended sign use.

The retroreflective sheeting shall permit color processing with compatible transparent and opaque process inks as approved by the sheeting manufacturer and listed on the QPL.

994-5 In-Service Minimum Requirements.

The retroreflective sheeting and screen processed retroreflective sheeting shall have the minimum coefficient of retroreflection as shown in ASTM D-4956, Outdoor Weathering Photometric Requirements for All Climates except Type VI fluorescent pink and fluorescent yellow. In addition, Type VII (Special) classified sheeting materials shall have a minimum coefficient of retroreflection of 80% of the values listed in the above table. Only the observation angle of 0.2 degrees and an entrance angle of -4 degrees shall be used in measuring in-service minimums. The in-service life for opaque overlay films, black processing inks and opaque lettering shall equal the life of the reflective sheeting to which it is applied.

994-6 Packaging and Labeling.

Packaging and labeling shall meet the requirements of ASTM D-4956.

994-7 Samples.

Field samples will be obtained in accordance with the Department's Sampling, Testing and Reporting Guide Schedule or on a random basis at the discretion of the Engineer.

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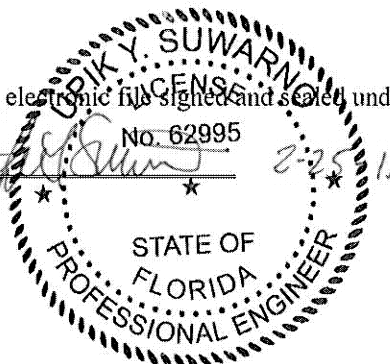
VIDEO VEHICLE DETECTOR ASSEMBLY

FINANCIAL PROJECT ID: 425530-1-58-01

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VIDEO VEHICLE DETECTOR

663-1 Description

Install video vehicle detectors as shown in plans. The system shall be capable of providing presence vehicle detection at signalized intersections. The video detection system shall be expandable without removing or replacing existing units.

Using standard image sensor optics and in the absence of occlusion, the system shall be able to detect vehicle presence with 98% accuracy under normal conditions (days and nights), and 96% accuracy under adverse conditions (fog, rain, etc).

663-2 Materials

663-2.1 General: Use only video vehicle detectors currently listed on the Department's Approved Product List (APL). Ensure that all equipment is marked in accordance with Section 603 and the markings are visible after installation.

All items and materials furnished shall be new, current production models installed and operational in a user environment, and shall be items currently in distribution.

The system shall be capable of monitoring all vehicles on the roadway, providing video-based vehicle detection and have the capability of being programmed via a CRT display and a mouse. As a minimum, the video detection system shall consist of the following materials:

- (1) Video Image Processing unit(s)
- (2) Video Detection Module(s)
- (3) Video Camera(s) with IR filter, enclosure, and sun shield
- (4) Camera lens
- (5) Camera housing
- (6) Surge suppressor
- (7) Sensor Bracket(s)
- (8) Programming Devices and software
- (9) Coaxial/Power Cable
- (10) Point Discharge Dissipation Terminals
- (11) Coax Line Protectors
- (12) Camera Power Protectors
- (13) Mounting System
- (14) Detector programming device
- (15) Software
- (16) All other necessary equipment for operation

These devices must comply with any applicable FCC regulations. Operation and Maintenance Manuals shall be supplied with each unit. These manuals shall include the following information:

- (1) General description
- (2) General characteristics
- (3) Installation procedure

- (4) Theory of operation
- (5) Schematic and logic diagram
- (6) Parts list (to include part type, part number manufacturer and ratings)

The manufacturer shall provide the following technical data for all materials where applicable:

- (1) Model number
- (2) Power and Current requirements/consumption
- (3) Temperature range
- (4) Weight and Dimensions
- (5) Mechanical Construction
- (6) Mounting equipment necessary
- (7) Operating frequency (FCC approved)
- (8) Detection Range, Angle, and Pattern (horizontal and vertical)
- (9) Response time and Sensitivity
- (10) Software for operation of device
- (11) Device capabilities as claimed by manufacturer.
- (12) Any limitations, requirements, or potential hazards associated with the operation or maintenance of the device.

The manufacturer will test all video units to ensure compliance to all FCC and department specifications.

The manufacturer will be required to supply a medical statement as to the safety of the unit to the general public (example: pacemakers, etc.).

All product documentation shall be written in the English language.

663-2.2 Video Image Processor: The Video Image Processor (VIP) shall be modular by design and housed in either a self-contained stand-alone unit or fit directly into NEMA TS1 & TS2 type racks mount installation without replacing or modifying the existing VIP units. The VIP module shall be able to connect to a camera.

A video system communication board shall control from 1 to 6 VIP boards allowing for 1 to 12 image sensors.

The system shall be designed to operate reliably in the adverse environment of roadside cabinets and shall meet or exceed all NEMA TS1 and TS2, as well as ATC environmental specifications.

The VIP Video inputs shall be 75 ohms impedance with High Z option.

Ambient operating temperature shall be from -34 to +74 degrees Centigrade at 0 to 95% relative humidity non-condensing.

The system shall be powered by a self contained power supply. Power consumption shall not exceed 135 Watts.

Surge ratings shall be set forth in the NEMA TS1 and TS2 specifications.

Serial communications shall be via an RS232 serial port, modem and Ethernet communication port (RJ-45 connection). The Ethernet communications port shall meet the latest applicable IEEE Ethernet Protocol standards and shall be capable of communicating at 10/100 mbps. These ports can be used for communications to a laptop, modem or fiber modem for

upload/download detector configurations, count, turning movement, queue length data, technical events, send firmware upgrades and carryout remote setup of detectors. A standard Internet browser shall connect to Ethernet IP addressable port (RJ-45 connection) to monitor and set-up the VIP boards. RS485 on the front panel shall facilitate communications to other VIP boards.

Each VIP board shall have 4 opto-isolated open collector outputs. Twenty (20) additional outputs shall be available via the expansion port. The outputs shall be programmed for signaling the presence, the arrival or the departure of vehicles in a minimum of 24 detection zones per video image.

Each VIP board shall allow for twenty (20) digital inputs via the I/O Expansion port.

Each VIP board shall have error detection. An output contact will provide a constant call if the video signal is bad or the VIP board is not functioning properly. A user defined quality level will automatically put the VIP into a recall state in cases of severe degraded visibility (i.e., fog, blizzard, etc.). Normal detection resumes when visibility improves above the user defined quality level.

Operator selectable recall shall be available via the VIP front panel. The operator shall have the ability to assign selectable outputs for recall.

A video select button on the VIP front panel will switch between camera images of the VIP.

The VIP board shall have one (VIP3.1) or two (VIP3.2) video inputs (RS-170 NTSC or CCIR composite video) and one video out.

The VIP board shall have a reset button on the front panel to reset video detectors to “relearn”, the roadway image. During “relearn”, selectable recall can be enabled or disabled for immediate operation. Learning time of video detectors shall be less than 6 minutes.

External surge suppression, independent of the VIP board shall separate the VIP from the image sensor.

The VIP board shall have separate light emitting diodes (LEDs) that indicate:

Power	Red to verify power supply.
1/1 Comm	Green to indicate communications to expansion boards.
Video 1 & 2	Green to verify the presence of video input 75 ohm.
TS & RX	Green to indicate communications via the RS485 and Ethernet communication.
Out1 – Out4	Green if the corresponding detection group is active.

The VIP board shall have 2 separate buttons for Video Select:

Recall	Manually places call or selects video on detectors.
Reset	Manually reset detectors to “learn” new background.

The VIP board shall have a: a) video out female RCA style connector b) DB9 female Service port c) DB9 I/O Expansion port.

The VIP Expansion board shall have separate LEDs that indicate:

Power	Red to verify power supply.
Comm	Green to indicate communications to VIP board.
I/O1-I/O4	Green if the corresponding detection group is active.

The VIP Expansion board shall have 8 dipswitches that define which inputs and outputs are to be used.

663-2.3 Functional Capabilities: Video vehicle detector system shall provide real time detection.

Each VIP board shall be capable of processing the video signal of a minimum of four cameras. The video signal shall be analyzed in real time. It shall provide software MPEG-2 video compression at 30 frames per second.

The system shall be expandable up to 12 cameras that may be connected to different VIP units and programmed independently.

The system shall be capable of displaying detectors on the video image with associated outputs. Outputs/Inputs status will be indicated on the screen. Selectable text overlay will also include the ability to view raw video without any verbiage and/or detectors for monitoring purposes.

Each VIP board will detect within the view of the connected camera the presence of vehicles in user-defined zones. Detectors available shall be presence, count, queue length, turning movement, delay, extension, or pulse mode of either arrival or departure of vehicles. Delay and extension shall be defined between 0.1 - 99 seconds and pulse mode between 0 – 165ms in 33ms increments. Queue length detector thresholds can be programmed to generate an output when the threshold is exceeded.

The VIP board shall be programmed with a standard CCTV monitor and keypad plugged into the VIP serial port to facilitate detector programming.

The VIP board shall store up to 8 detector configurations. It shall be possible to switch between detector configurations manually or automatically by time of day or input from the traffic controller.

Via the serial port, detector configurations can be uploaded to a laptop and stored on disk.

Detectors may be linked to 24 outputs and 20 inputs using Boolean Logic features: AND, OR, NOT.

It shall be possible to make a detector directional sensitive. Options will include an omni-directional detector or a detector that only senses movement: from right to left, left to right, up to down or down to up as you look at the monitor.

To facilitate “fine tuning” of detection zones, a maximum of 10 lines and a minimum of 4 lines shall be adjustable within the confines of the detector.

All detectors and parameters can be changed without interrupting detection. For example: when one detector is modified all existing detectors continue to operate, including the one that is being modified. When the new position is confirmed, the new detector will enter a learning phase. Once the new detector is fully functional, it will take over the job of the old one. In this way, the detector is always fully operational with no interruption on any detector, even during modification. Learning phases for new detectors shall not exceed 6 minutes.

Six detectors per input may be used as count, turning movement and queue length detectors. These detectors will detect and store data at user-defined intervals of 1,2,3,4,5,6,10, 15, 30 & 60 minutes. It shall be possible for each VIP board to store up to 14226 intervals of data in non-volatile memory.

Associated software may be used with a PC to download data and export to a spreadsheet. Software will also be used to upload/download detector configurations, count, turning movement and queue length data, technical events, send software version upgrades and do remote setup of detectors.

The VIP board shall have an internal clock with daylight saving time system, which can be enabled or disabled.

The VIP board shall have a security password embedded, which may be enabled or disabled by the supervisor.

The VIP board shall monitor the 120 VAC green outputs of each movement and provide Delay Detection and Stretch Detection Program capability with Green Overrides programmable for each detection zone. Intervals shall be programmed in whole second increments from 0" to 60".

663-2.4 Video Camera: The unit shall be a high resolution (horizontal resolution 460 TV Lines), 1/3" image format CCD camera, designed for professional video detection systems to capture images of vehicles under all weather and lighting conditions. Incorporating the latest in CCD technology, the video camera shall provide detailed video without lag, image retention, or geometric distortion. The VIP board shall work with monochrome and/or color cameras as the video source for real-time vehicle detection.

The Camera must be in an enclosed assembly with the following minimum specifications:

Temperature range	-34 to +74 degrees C
Humidity	0% to 95% relative, non-condensing
Dimensions	47mm X 47mm X 83mm
Weight	200g (max)
Camera mounting slots	¼-20, top and bottom
Connectors	BNC for video out
Lens mount	CS
	Power-in/pressure screw
	Lens/4-square connector
Finish	Off-white, semi-gloss polyurethane
Construction	All metal housing
Rated input voltage	12VDC or 24VAC +/-10%@60Hz
Nominal power	10 Watts maximum
Imager	Interline transfer CCD 1/3"format
Imager spectral response	100% @ 550nm: 30% @ 400nm and 800nm
Sync system	EIA RS-170
Active picture elements	768 H X 494 V
Horizontal resolution	580 TVL

Sensitivity (2856 K)		Usable	Full
		Picture	Video
Scene Illumination	fc	0.012	0.08
	lx	0.12	0.8
Imager Illumination	fc	0.0015	0.01
	lx	0.015	0.1
F1.2 lens @ 75% highlight			
Signal to noise ratio	54 dB minimum		
	58 dB typical		
AGC	18 dB		
Light range (AGC on)	1,000,000:1 min. with f/1.4 to		
	360 auto-iris lens		
Video out	1.0 volts peak-to-peak +/- 0.1		
	Volt @ 75 Ohms		
Gray scale	At least 10 steps		

663-2.5 Camera Lens: The camera lens shall be a motorized vari-focal 6.5-39mm with auto iris, including:

Image format	1/3 inch
Focal length	6X zoom (6.5-39mm)
Iris range	f 1.0 – Approx. 1200
Back focus distance	10.05mm (0.4in.) in air
Weight	500g
Size	60mm X 70mm X 89.9mm
Lens mount	CS
Iris control	DC or Video 4-pin square
Focus control	Motorized
Zoom	Motorized

663-2.6 Camera Housing: The camera assembly shall include a weatherproof housing and an integral sunshield for outdoor installation.

The weatherproof housing shall incorporate a mounting bracket to allow proper positioning of the camera. The mounting bracket shall be pre-drilled to allow attachment to standard brackets for mounting on mast arms or on Luminaire arms. Separate connectors at the back of the housing for both video and power cables shall be provided to make the camera assembly field-replaceable if service is required. A heater shall be mounted near the faceplate of the housing to minimize condensation.

The sunshield shall minimize the heating of the housing during hot weather. The sunshield shall extend beyond the ends of the weatherproof housing to minimize rain on the faceplate or body of the housing to eliminate dripping water in the line of sight of the camera.

The weatherproof housing shall be an aluminum enclosure and as a minimum, shall meet the following specifications:

Temperature range	-34 to +74 degrees C
Dimensions	449mm x 97mm x 112mm
Weight	1.4kg
Housing mounting	Three 1/4-20 tapped holes

Camera mounting	Removable cradle assembly
Cable entry	Three liquid-tight fittings that will accept cable diameters of: One fitting – 2 to 7 mm Two fittings – 3 to 10 mm
Finish	Off-white semi-gloss polyurethane
Construction	Extruded aluminum housing, Aluminum rear-end cap, Aluminum front cap with glass faceplate, and aluminum cradle A sunshield shall be included
Window	3 mm thick glass, that includes a Thermostatically controlled window Heater/defogger strip
Rated input voltage	115 VAC 60 Hertz
Voltage range	108 VAC to 132 VAC
Output voltage	24 VAC 60 Hertz
Nominal power	30 Watts (Includes 20 Watts max for heater)
Enclosure protection	Waterproof and dust-tight in a NEMA-4, IP65, enclosure Type 3

663-2.7 Surge Suppressor: The video surge suppressor shall provide coaxial cable connection points to a transient suppressor for each image sensor and as a minimum shall include the following:

Peak Surge Current (8x20 us)	5KA
Technology	Hybrid, Solid State
Attenuation	0.1db @ 10Mhz
Response Time	<1 nanosecond
Protection	Line to Ground
Shield to Ground	(isolated shield modules)
Clamp Voltage	6 volts
Connectors	BNC
Impedance	75 Ohms
Temperature	-34 to +74 degrees C
Humidity	0-95% non-condensing
Dimensions	4.5" x 1.5" x 1.25"
UL Listed	UL 497B

Point Discharge Dissipation Terminal and Camera Power Protectors shall be provided for each camera. An Uninterruptible Power Source of at least 350 VA capacity shall be provided for the VIP and cameras.

663-2.8 Sensor Bracket: Camera brackets for mast arm installations shall provide adjustments for both vertical and horizontal positioning for the camera. Camera attachments shall be designed to securely fasten the camera to prevent the camera assembly from falling into the path of vehicles and/or becoming loose. Miscellaneous hardware shall be stainless steel or galvanized steel.

Camera brackets for luminaire arm installations shall provide adjustments for both vertical and horizontal positioning of the camera. Camera attachments shall be designed to securely fasten the camera to the luminaire arm. Miscellaneous hardware shall be stainless steel or galvanized steel.

663-2.9 Coaxial and Power Cable: Coaxial & Power cable (Hybrid) shall be suitable for exterior use and in direct sunlight. Power cable shall have a minimum of 5 conductors. Coaxial cable will be used for zooming and, focusing of the image sensor from the controller cabinet.

663-2.10 Programming Device: In an effort to upload/download detector configurations, count, turning movement and queue length data, technical events, send software versions upgrades and to setup detectors, the product supplier of the video detection system shall provide one (1) laptop devices with the following minimum configuration:

Central Processor (1.5GHz) with the following:
32MB Video, 14.1 XGA
USB Optical Mouse with Scroll feature
512MB Memory, 2DIMM
24X CDRW/DVD Drive
40 GB Ultra ATA Hard Drive
Internal 56K Modem
3.5" 1.44HD Floppy Drive
Windows XP Operating System (professional)
48WHr Additional Modular Battery for Dual Battery Support
Microsoft Office "Standard"

663-2.11 Software: The manufacturer software shall be provided for detection zone programming and operation. One software package shall be provided for each detection system. Software updates/revisions shall be provided to the FDOT as updated by the manufacturer at no additional charge.

All setup, controller program and diagnostic software shall be provided and run on the latest version of Windows based-operating systems. Software updates shall be provided free of charge during the warranty period.

All on-line help shall be provided as an integral part of the system software.

The operator shall be able to perform the following functions through the setup program.

- (1) View a detection output from the detection unit.
- (2) View a low signal from the detector unit.
- (3) Program the presence timeout parameters in one minute increments from zero to thirty minutes.
- (4) Provide a quick tune feature for re-tuning in an expedited fashion under ideal background condition.
- (5) Select and program a new ID number for each detector unit.
- (6) Program a response time for the detector unit.
- (7) Program a hysteresis value from a selection of low, medium, or high.
- (8) Program a profile number for each detector unit.

The system shall include software that detects vehicles in multiple lanes using only the video image. Detection zones shall be defined using only an on board video menu and a pointing device the zones on a video image. Up to 24 detection zones per camera view shall be available. A separate computer shall not be required to program the detection zones.

663-3 Installation

663-3.1 General: Take all precautions necessary for the protection of all personnel and meet all requirements of OSHA regulations and FDOT Specifications Section 7-1.5 for the Occupational Safety and Health Requirements associated with this work.

Use manufacturer recommended tools and equipment to install all video detection equipment, retaining/mounting devices and software. All special installation and maintenance equipment must be provided by the vendor/manufacturer and should allow for adjustments without lane closure.

A factory certified representative from the manufacturer should be on-site during installation to supervise the installation and testing of the video equipment by maintaining agency personnel.

663-3.2 Mounting: Video detectors work in either a side-fire or overhead position. They should be mounted at a height that enables distinction between vehicles. Special instructions for mounting must be provided by the manufacturer.

Consider the location of the installed video detectors on the plans as sufficiently flexible as to allow for unanticipated field conditions at the site. The Engineer will direct any variations from the locations shown.

663-3.2 Powering: The manufacturer must provide required amplifiers for installation.

663-3.3 Calibrations and Aiming: All calibration and aiming shall be done with the device mounted in place, without interruption of traffic. Adjustments will be made according to manufacturer's recommendations.

The operator shall be able to set up, monitor lane status and retrieve data from the detector through the RS 232 serial port with any IBM compatible laptop or desktop computer. Also, the detector shall be compatible with a standard phone modem for remote data retrieval.

The sensor shall be able to hold the detection until the zone is cleared. Additionally, the sensor shall be able to tune-out stationary targets that remain within the detection zone for a minimum of 15 minutes.

The sensor shall self-tune to its detection zone with no external adjustments other than physical alignment. There will be no external tuning controls of any kind, which will require an operator.

The detector output must be directly compatible with the controller cabinet detector input.

663-4 Method of Measurement

663-4.1 General: Measurement for payment will be in accordance with the following task.

663-4.2 Furnish and Install: The Contract unit price per each for Vehicle Detector Assembly, furnished and installed, will include all equipment, materials as specified in the Contract Documents and as specified in this Section, and all labor, equipment, and miscellaneous materials necessary for a complete and accepted installation.

663-5 Basis of Payment

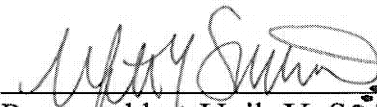
Price and payment will be full compensation for all work specified in this Section. Payment will be made under:

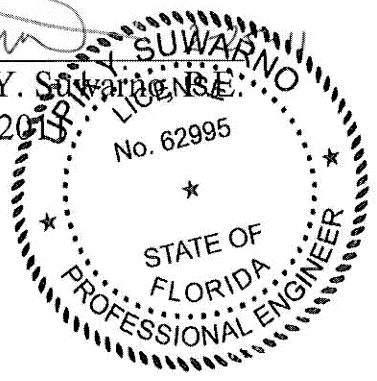
Item No. 663-74-15 Vehicle Detector Assembly (Video) – each.

TECHNICAL SPECIAL PROVISION
FOR
UNINTERRUPTIBLE POWER SOURCE

Financial Project ID: 425530-1-58-01

The official record of this package is the electronic file signed and sealed under Rule 61G 15-23.003, F.A.C.


Prepared by: Upik Y. Suwarno
Date: February 25, 2018
Pages 1 thru 6



UPIK Y. SUWARNO
LICENSE
No. 62995
★
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Uninterruptible Power Source (UPS) with Battery Charger/Battery Eliminator.

685 -1 Product

These are the minimum requirements for an Uninterruptible Power Source (UPS) with an external battery charger/battery eliminator. It is to provide battery backup when commercial power is lost and to smooth the power when operating on a generator.

The UPS shall be on the Florida Department of Transportation's Approved Products List (APL). The product must be officially on the FDOT's APL.

The unit shall be comprised of but not limited to; UPS, cabinet enclosure, inverter/charger/controller and an external power converter/charger, power transfer switch with a manually operated, non-electronic bypass switch, and all necessary hardware and interconnect wiring.

UPS equipment shall be compatible with maintaining agency existing system and shall include Ethernet connection and SNMP V3 Support.

685-2 Function

The UPS shall provide a minimum of 8 hours battery back-up time under a 450 watt load @ 25°F. Battery balancer and equalizer shall be included. While operating on generator power, the external battery charger shall charge the batteries and operate the intersection. The UPS shall have lightning surge protection compliant with IEEE/ANSI C.62.41 for 2000 Volts AC.

The UPS shall be field programmable from a touch pad on the unit and from a computer interface. They must be user friendly, in menu driven formats and must not require external or proprietary software. The DB-9 connector for the RS-232 interface must be installed on the front panel of the UPS. The UPS shall have a battery connector on the front panel. The battery connector shall be an Anderson p/n SB50 or equivalent. The UPS shall have an external battery temperature probe connector on the front panel.

The UPS shall be capable of performing a SELF-TEST from the UPS front panel LCD and remotely via an RS-232 interface. The duration of the SELF-TEST shall be programmable in 1-minute increments from 1 min. to 255 minutes.

The operation of the flash mode shall be field programmable to activate at various times depending on remaining battery capacities.

The batteries shall be Absorbed Glass Matt/Valve Regulated Lead Acid (AGM/VRLA) type specifically designed for UPS's and outdoor use. The batteries shall be designed for "Float Service" to provide 100% out-of-box runtime capacity.

The maximum transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, shall be less than 65 milliseconds. The same maximum allowable transfer time shall also apply when switching from inverter line voltage to utility line voltage. The transfer from utility power to battery power, and vice versa, shall not interfere with the normal operation of the traffic controller, conflict monitor or any other peripheral devices within the traffic controller assembly.

When utilizing battery power, the UPS output voltage shall be between 110VAC and 125VAC, pure sine wave output with THD < 3% at 60 Hz +/- 3 Hz.

The UPS shall be capable of providing power for all of the following: full run-time operation, flashing mode operation, or a combination of both full and flash mode operation of an intersection. The batteries shall not be charged when battery temperature exceeds 50°C +/- 3°C.

The temperature sensor shall be external to the UPS unit. The sensor output will be used to regulate the charge rate at high ambient cabinet temperature.

The batteries shall be approved for both float and/or standby applications. The batteries shall charge whether on generator power or on commercial power. The UPS shall have a user configurable low battery warning. The UPS shall have a low battery shutdown and a low battery alarm. The UPS low battery shutdown will shut down the UPS unit to prevent battery deep-discharge. The programmable LOW BATTERY alarm shall be user definable and available for local access and via the RS-232 for remote access.

The UPS shall be equipped with an event log that stores at a minimum the last 100 events. The events shall be time and date stamped. The event log shall be retrievable from the RS-232 and from the UPS LCD screen. The RS-232 communication to the PC shall display events in a Text message format with the use of HyperTerminal. The UPS LCD Screen shall display the events in a Binary message format.

The UPS shall have six (6) independently programmable control relays for control and report functions. The UPS shall have two (2) 0 to 8 hour, independently programmable timers with two (2) time-of-day restrictions on each timer.

The UPS shall have six (6) sets of normally open (NO) and normally closed (NC) single pole double-throw (SPDT) dry contact relays rated for 120VAC @ 1A.

1. ON BATTERY. The relay is energized whenever the UPS switches to battery power.
2. LOW BATTERY. The relay is energized when the battery has reached a user defined low battery level of remaining useful capacity. This alarm is latched when a qualified line returns or the inverter shuts down.
3. TIMER 1. The relay is energized after being in backup mode for a given amount of time. This timer is adjustable from 0 to 8hr. The default setting is two (2) hours.

4. ALARM- relay activates after a specific after a specific or general alarm is detected. These alarm conditions include: line frequency, low output voltage, no temperature probe, overload, batteries not connected, high temperature, and low temperature. The relay can be programmed to activate when any of these alarm conditions are met, or when a specific condition is met.
5. FAULT- relay activates after a specific or general fault is detected. These fault conditions include: short circuit, low battery voltage, high battery voltage, high internal temperature, and excessive overload. The relay can be programmed to activate when any of these fault conditions are met, or when a specific condition is met.
6. AC/DC FAN CONTROL. The relay is activated when the battery ambient temperature is greater than 35°C or at a user programmable threshold from 25 to 55°C @ 5°C increment.

The operating temperature for the UPS, power transfer switch, and manual bypass switch shall be -37°C to +74°C @ 1500 Watts.

The operating temperature range of the external inverter/charger shall be 0° to 40°C with the capability of operating output amperage of 15 Amps @ 54.4 Volts. The external inverter/charger shall shut down for temperatures over 80°C.

The UPS shall be compatible with all of the following for full phase, flash operation mode, or a combination of both full and flash mode operation:

- Type 332 cabinets,
- Type 170 controllers,
- Type 2070 controllers,
- NEMA TS1 Controllers,
- NEMA TS2 Controllers,
- Electrical Service Pedestals

The UPS shall be easily replaced and installed (complete turnkey system with all necessary hardware). UPS shall not require any special tools for installation.

The UPS shall be equipped to prevent a malfunction feedback to the cabinet and from feeding back to the utility service per UL 1778, Section 48 “Back-feed Protection Test”. The upstream back feed voltage from UPS system shall be less than 1 Volts AC.

In the event the UPS senses the utility line voltage is outside the Hi and Low Limits (100 & 130VAC respectively set as default), the UPS shall transfer the load to battery power. The user can change the Hi and Low limits to suit NEMA Hi and Low Limit Specifications.

A low profile, red LED light shall indicate loss of commercial power. It shall be mounted on the top of the cabinet.

The UPS shall return to line mode when the utility power has been restored to above 105VAC and below 125VAC for more than 30 seconds and when the utility power is back to nominal.

This line qualification time will be adjustable to 3, 10 to 30 seconds. The operator will have the option of making the adjustments locally, using the touch pad or remotely, using the RD-232 interface.

The power transfer switch (PTS) shall be activated during BUCK and BOOST operation. The power transfer time shall be 10 milliseconds or less. The BUCK and BOOST mode shall be provided in case of extended power variations. The UPS shall have the ability to BUCK and BOOST at least 10% +/-.

In the event of UPS failure, battery failure, or complete battery discharge, the power transfer switch shall revert to the Utility or Line Mode (in a de-energized state).

The PTS shall automatically remove power to the intersection's illuminated street name signs when the UPS is operating on battery back-up.

685-3 Assembly

The piggy-back cabinet shall be manufactured from H5052 0.125 aluminum and house the UPS system, including batteries, switches, charger, inverter and mounting kit. The cabinet must meet the requirements for NEMA 3R enclosures. The door shall have a 3-point locking system with $\frac{3}{4}$ inch ball bearing nylon rollers and a number 2 lock. The door shall have louvered vents with a 9" X 14" replaceable filter. The door shall be attached to the cabinet with a 316 stainless steel continuous hinge and be riveted to the cabinet with stainless steel rivets. The door shall seal with neoprene gasket. The handle shall be $\frac{3}{4}$ inch 316 stainless steel with pad lock hasp. The roof of the cabinet shall slant from back to front to allow rain to shed away from the mounting cabinet. The cabinet shall have a separate shelf for the UPS and adjustable shelves for batteries.

The cabinet shall have a generator access compartment with a $\frac{1}{4}$ turn twist lock receptacle inside to allow the cabinet to be powered by a generator. The generator access door shall be flush mounted with a number 2 lock. The door shall be bolted on with six $\frac{1}{32}$ stainless steel pem studs. The door shall be capable of closing and locking while the generator cord is plugged into the $\frac{1}{4}$ turn twist lock receptacle. A fan must be mounted in the air baffle at the top of the cabinet with an air outlet built into the overhang. The fan must be thermostatically controlled. The bottom of the door must be louvered to allow airflow. A removable dust filter must be located behind the vent. The UPS shall be cooled by a variable speed fan that is microprocessor and PWM controlled. The fan shall be OFF when the ambient temperature is less than 40°C.

A fluorescent light shall be provided and be turned on through a cabinet door switch

One mounting kit and wiring kit shall be included with each UPS cabinet assembly. The mounting kit shall include twelve $\frac{5}{16}$ inch, stainless steel bolts with nuts, washers, and lock washers. A 1 $\frac{1}{2}$ inch by $\frac{1}{4}$ inch rubber grommet shall be provided for the cabinet through hole protection.

The wiring kit shall include six, 12 foot, color coded AWG 10 wires with the following color code and point of termination:

Black with red stripe	incoming commercial A/C power
Black	incoming generator A/C power
White	A/C neutral
Green	A/C ground
Blue	main circuit breaker in controller cabinet
Red	auxiliary circuit breaker in controller cabinet

The enclosure will include built-in transfer switches for both bypassing the UPS for maintenance and to manually transfer to generator power when a generator is connected during power outages.

The batteries shall be provided with appropriate interconnect wiring harnesses with 75 amp quick disconnects with oxlic grease that prevents oxidation and improved conductivity. Battery terminals shall be sprayed with a protective spray that prevents corrosion buildup and neutralizes battery acid.

685-4 Warranty

The UPS shall have a two (2) year full replacement, non-prorated manufacturer's warranty.

Shipping, handling, and all costs associated with repairing or replacing faulty equipment shall be covered by the vendor.

The manufacturer shall provide trouble-shooting via a toll free customer service number.

The manufacturer shall make field maintenance available via a toll free customer service number.

685-5 Method of Measurement

General: Measurement for payment will be in accordance with the following task.

Furnish and Install: The Contract unit price per each for Uninterruptible Power Source (UPS), furnished and installed, will include all equipment, materials, as specified in the Contract Documents and as specified in this Section, and all labor, equipment, and miscellaneous material necessary for a complete and accepted installation.

Basis of Payment: Price and payment will be full compensation for all work specified in this Section. Payment will be made under:

Item No. 685-106 Uninterruptible Power Source (UPS)-each.



CONTRACT DRAWINGS
CORTEZ ROAD WEST (SR 684) AT 43RD STREET WEST
INTERSECTION IMPROVEMENTS
FOR
MANATEE COUNTY, FLORIDA
COUNTY PROJECT NUMBER: 6076860
FINANCIAL PROJECT ID: 425530-1-58-01
(FEDERAL FUNDS)
SIGNALIZATION PLANS
SIGNAL ID NUMBER: 446

GOVERNING STANDARDS AND SPECIFICATIONS:

FLORIDA DEPARTMENT OF TRANSPORTATION DESIGN STANDARDS, DATED 2010
AND APPLICABLE SECTIONS, ARTICLES AND SUBARTICLES OF DIVISION I
AND ALL DIVISION II & III OF THE FLORIDA DEPARTMENT OF TRANSPORTATION
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DATED 2010,
INCLUDING ALL SUPPLEMENTAL SPECIFICATIONS, AS AMENDED BY CONTRACT DOCUMENTS.

APPLICABLE DESIGN STANDARDS MODIFICATIONS: 7-1-10. FOR DESIGN STANDARDS
MODIFICATIONS CLICK ON "DESIGN STANDARDS" AT THE FOLLOWING WEB SITE:
[HTTP://WWW.DOT.STATE.FL.US/RDDSIGN/](http://www.dot.state.fl.us/rddesign/).

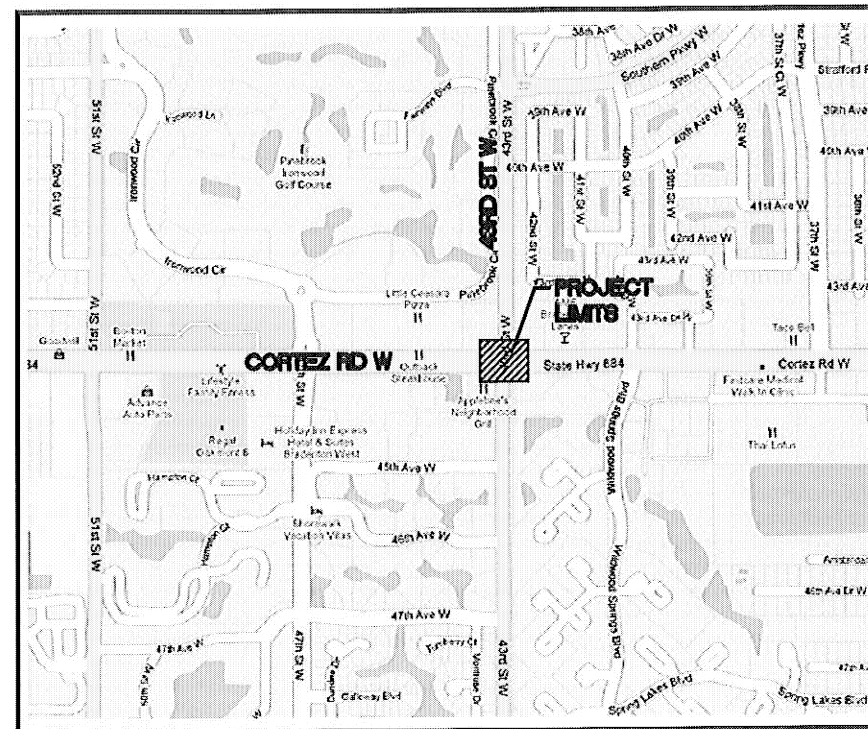
ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS
MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION.
THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

UTILITY WARNING NOTE

ABOVE GROUND AND / OR UNDERGROUND UTILITIES MAY BE IN THE AREA OF THIS PROJECT
- PROCEED WITH CAUTION - THE CONTRACTOR SHALL CALL SUNSHINE STATE "ONE CALL" AT
1-800-432-4770 AND THE UTILITY OWNERS IN ADVANCE OF BEGINNING WORK, IN
ACCORDANCE WITH CHAPTER 558, FLORIDA STATUTES.

SUMMARY OF REVISIONS

DATE	DESCRIPTION



INDEX OF PLANS

SHEET NO	SHEET DESCRIPTION
T-1	COVER SHEET
T-2	TABULATION OF QUANTITIES
T-3	GENERAL NOTES
T-4	PAY ITEM FOOTNOTES
T-5	SIGNALIZATION PLAN
T-6	MAST ARM TABULATION
T-7	MAST ARM TABULATION (CALCULATION CONFIGURATION)
T-8	TABLE OF VARIABLES FOR SPECIAL
T-9	MAST ARM ASSEMBLIES
T-10	PAVEMENT MARKING PLAN
T-11	GUIDESIGN WORKSHEET
T-12	CONSTRUCTION DETAILS
T-13	REPORT OF MAST ARM BORINGS

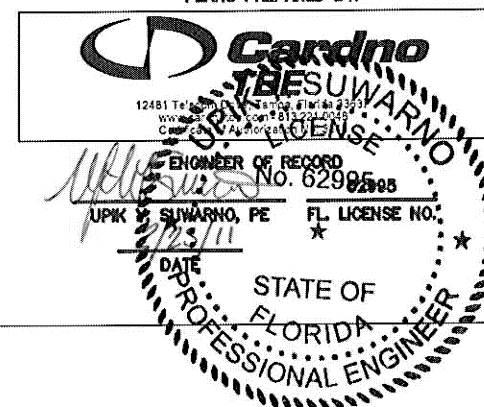
SHOP DRAWINGS TO BE SUBMITTED TO:

UPIK Y. SUWARNO, P.E.
CARDNO TBE
12481 TELECOM DRIVE
TAMPA, FLORIDA 33637
(813) 221-0048



48 HOURS BEFORE DIGGING
CALL SUNSHINE
1-800-432-4770

PLANS PREPARED BY:



FINAL

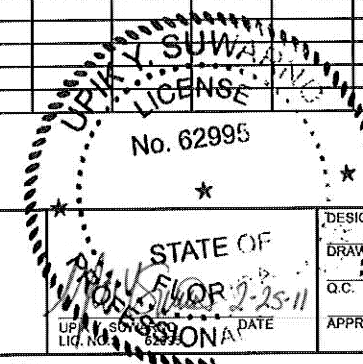
DATE: 02-25-11
SCALE: HORIZ: N/A
VERT: N/A
SHEET: T-1

TABULATION OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	SHEET NUMBERS																				TOTAL THIS SHEET		GRAND TOTAL		REF. SHEET
			T-5		T-9		T-11																				
			PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	
101-1	MOBILIZATION	LS																					1		1		
102-1	MAINTENANCE OF TRAFFIC	LS																					1		1		
110-4	REMOVAL OF EXISTING CONCRETE PAVEMENT	SY					93.4																93.4		93.4		
520-1-10	CONCRETE CURB & GUTTER, TYPE F CURB	LF					104																104		104		
522-2	6" CONCRETE SIDEWALK	SY					165.5																165.5		165.5		
555-1-2	DIRECTIONAL BORE (6" TO <12") (2" HDPE)	LF	315																				315		315		
630-1-12	CONDUIT (F&I) (UNDERGROUND) (1.25")	LF	10																				10		10		
630-1-12	CONDUIT (F&I) (UNDERGROUND) (2")	LF	1320																				1320		1320		
630-1-13	CONDUIT (F&I) (UNDERPAVEMENT)	LF	70																				70		70		
632-7-1	CABLE (SIGNAL) (F&I)	PI	1																				1		1		
635-1-11	PULL & JUNCTION BOXES (F&I) (PULL BOX)	EA	11																				11		11		
639-1-22	ELECTRICAL POWER SERVICE (UNDERGROUND)	AS	1																				1		1		
	(PURCHASED BY CONTRACTOR FROM POWER CO)																										
639-2-1	ELECTRICAL SERVICE WIRE (F&I)	LF	840																				840		840		
641-2-12	PRESTRESSED CONCRETE POLE (F&I)	EA	1																				1		1		
	(TYPE P-II SERVICE POLE) (12FT)																										
649-31-299	STEEL MAST ARM ASSEMBLY (F&I)(130 MPH)(CUSTOM)	EA	4																				4		4		
650-51-311	TRAFFIC SIGNAL (F&I) (3-SECT.) (1-WAY) (LED)	AS	4																				4		4		
650-51-511	TRAFFIC SIGNAL (F&I) (5-SECT.) (1-WAY) (LED)	AS	4																				4		4		
653-191	PEDESTRIAN SIGNAL (F&I) (LED COUNTDOWN) (1 WAY)	AS	8																				8		8		
659-101	SIGNAL HEAD AUXIL. (F&I) (BACKPLATES, 3-SECT)	EA	4																				4		4		
659-106	SIGNAL HEAD AUXIL. (F&I) (TUNNEL VISOR)	EA	32																				32		32		
659-107	SIGNAL HEAD AUXIL. (F&I) (ALUMINUM PEDESTAL)	EA	8																				8		8		
659-118	SIGNAL HEAD AUXIL. (F&I) (BACKPLATES, 5-SECT)	EA	4																				4		4		
663-74-15	VEHICLE DETECTOR ASSEMBLIES (F&I) (VIDEO)	EA	4																				4		4		
665-13	PEDESTRIAN DETECTOR (F&I) (WITH SIGN ONLY)	EA	8																				8		8		
670-5-110	TRAFFIC CONTROLLER ASSEMBLY (F&I) (NEMA)	AS	1																				1		1		
	(NO PREEMPTION)																										
685-106	UNINTERRUPTIBLE POWER SOURCE (UPS)	EA	1																				1		1		
690-10	REMOVE SIGNAL HEAD ASSEMBLY	EA	8																				8		8		
690-34-1	REMOVE POLE (DEEP) (DIRECT BURIAL)	EA	2																				2		2		
690-50	REMOVE CONTROLLER ASSEMBLY	EA	1																				1		1		
690-60	REMOVE VEHICLE DETECTOR ASSEMBLY	EA	10																				10		10		
690-80	REMOVE SPAN WIRE ASSEMBLY	EA	1																				1		1		
690-90	REMOVE CONDUIT & CABLING	PI	1																				1		1		
690-100	REMOVE MISCELLANEOUS SIGNAL EQUIPMENT	PI	1																				1		1		
699-1-1	INTERNALLY ILLUMINATED SIGN (F&I)(EDGE LIT LED)	EA	4																				4		4		
700-48-60	SIGN PANEL (REMOVE)	EA	3																				3		3		
711-11-111	THERMOPLASTIC PAVEMENT MARKINGS (6" WHITE)	LF			72																		72		72		
711-11-123	THERMOPLASTIC PAVEMENT MARKINGS (12" WHITE)	LF			465																		465		465		
711-17	REMOVE THERMOPLASTIC PAVEMENT MARKINGS	SF			525																		525		525		
780-1-12	ITS POWER SERVICE WIRE	LF	930																				930		930		
783-1-121	ITS FIBER OPTIC CABLE (F&I)	LF	115																				115		115		
783-2-31	ITS FIBER OPTIC (INSTALL) (SPLICE)	EA	4																				4		4		
784-1-1	ITS FIELD ETHERNET SWITCH	EA	1																				1		1		

MANATEE COUNTY

CORTEZ ROAD WEST AND
43RD STREET WEST



TABULATION OF QUANTITIES

PROJECT NO:
00193-008-05
DATE:
02-25-11
SHEET NO:
T-2

GENERAL NOTES

1. AT LEAST TWO (2) FULL BUSINESS DAYS PRIOR TO BEGINNING THE TRAFFIC SIGNAL INSTALLATION, PERMITTEE TO CONTACT THE TRAFFIC SIGNAL INSPECTOR/LIAISON:

MR. CARLOS CABRERA
FLORIDA DEPARTMENT OF TRANSPORTATION
SARASOTA OPERATIONS CENTER
1840 61ST STREET
SARASOTA, FLORIDA 34243
PH: 941-359-7317

2. ONE WEEK PRIOR TO THE BEGINNING OF THE TRAFFIC SIGNAL INSTALLATION, LOOP CUTTING, OR TURN ON OF A NEW SIGNAL, THE CONTRACTOR SHALL NOTIFY:

MANATEE COUNTY
PUBLIC WORKS DEPARTMENT
MANATEE COUNTY PROJECT MANAGEMENT DIVISION
1022 26TH AVENUE EAST
BRADENTON, FLORIDA 34208
PHONE: 941-708-7510

MANATEE COUNTY
PUBLIC WORKS DEPARTMENT
MANATEE COUNTY TRAFFIC ENGINEERING DIVISION
2101 47TH TERRACE EAST
BRADENTON, FLORIDA 34203
PHONE: 941-749-3502

3. TWO (2) FULL BUSINESS DAYS PRIOR TO BEGINNING CONSTRUCTION, CONTACT F.D.O.T. OPERATIONS CENTER, TELEPHONE 941-359-7317.

4. WHEN CONSTRUCTION IS COMPLETE, PROVIDE A SET OF "AS-BUILT" PLANS TO:

MANATEE COUNTY
PUBLIC WORKS DEPARTMENT
TRAFFIC DIVISION MANAGER
1022 26TH AVENUE EAST
BRADENTON, FL 34208-1000

5. THE PERMITTEE TO PROVIDE A QUALIFIED TECHNICIAN, TO PERFORM CONSTRUCTION ENGINEERING & INSPECTION SERVICES FOR THE INSTALLATION OF THE TRAFFIC SIGNAL, AND TO CERTIFY THAT ALL WORK HAS BEEN DONE IN ACCORDANCE WITH THE DEPARTMENTS STANDARDS, SPECIFICATIONS, PERMIT REQUIREMENTS, AND ALL APPLICABLE FEDERAL, STATE AND LOCAL STATUTES, RULES, AND REGULATIONS. IN ADDITION, THE ON-SITE INSPECTOR SHALL BE IMSA LEVEL II CERTIFIED.

6. SECTION 611, TRAFFIC SIGNAL ACCEPTANCE INSPECTIONS SHALL BE COORDINATED WITH F.D.O.T. TRAFFIC SIGNAL INSPECTOR/LIAISON A MINIMUM OF TWO FULL BUSINESS DAYS NOTICE.

RESULTS OF FIELD TESTS (I.E., SECTION 614) SHALL BE MADE AVAILABLE TO THE PROJECT ENGINEER IN WRITTEN FORM. A QUALIFIED CONTRACTOR'S REPRESENTATIVE SHALL BE PRESENT AT THE CONDITIONAL ACCEPTANCE INSPECTION OF THE CONTROLLER ASSEMBLY. THE QUALIFICATIONS OF THE REPRESENTATIVE SHALL INCLUDE:

- A) COMPLETE FAMILIARITY WITH ALL SYSTEM ELEMENTS INCLUDING CONTROLLERS, COORDINATING UNITS, SYSTEM CLOCKS AND SYSTEM COMMUNICATIONS ELEMENTS. THE REPRESENTATIVE SHALL BE QUALIFIED TO INPUT AND RECALL ALL CONTROLLER AND SYSTEM TIMING FUNCTIONS.

7. WHEN CONSTRUCTION DEVIATES FROM APPROVED PERMIT PLANS INCLUDING POSSIBLE EASEMENTS, PERMITTEE TO FURNISH THE DEPARTMENT OF TRANSPORTATION ONE SET OF "AS BUILT" PLANS FOR FDOT RECORDS;

DEPARTMENT OF TRANSPORTATION
P.O. BOX 1249
(STREET ADDRESS: 801 N. BROADWAY AVE)
BARTON, FLORIDA 33831
ATTENTION: TRAFFIC OPERATIONS - SIGNAL DESIGN

8. SUBMITTAL DATA FOR ALL PERMIT JOBS MUST BE DONE IN ACCORDANCE WITH F.D.O.T. SPECIFICATION SECTION 603.5.

9. THIS SIGNAL TO FLASH FOR A MINIMUM OF TWO (2) FULL BUSINESS DAYS BEFORE BEING PLACED INTO FULL OPERATION. FLASHING OPERATION SHALL START ON A MONDAY, TUESDAY OR WEDNESDAY. HOWEVER, THE FLASHING OPERATION SHALL NOT START ON THE DAY PRECEDING A HOLIDAY.

10. SIGNAL TO BE PLACED IN FULL OPERATION ON A MONDAY, TUESDAY, OR WEDNESDAY, BUT SHALL NOT BE PLACED IN FULL OPERATION ON THE DAY PRECEDING A HOLIDAY.

11. THE CONTRACTOR TO PROVIDE A WARRANTY/MAINTENANCE BOND FOR SIGNAL INSTALLATIONS IN ACCORDANCE WITH F.D.O.T. SPECIFICATION SECTION 611-5.

12. FOR PAVEMENT MARKINGS, SEE PAVEMENT MARKING PLANS.

13. ALL TRAFFIC SIGNAL POLES SHALL BE LOCATED IN ACCORDANCE WITH PLANS PREPARATION MANUAL (LATEST EDITION), SECTION 2.11 AND TABLE 2.11.4 (CLEAR ZONE WIDTHS) IN THE EVENT R/W OR IRRESOLVABLE UTILITY CONFLICTS PROHIBIT POLE PLACEMENT ACCORDING TO SECTION 2.11.4, PERMITTEE SHALL CONTACT TRAFFIC OPERATIONS ENGINEER AND/OR DISTRICT DESIGN ENGINEER TO OBTAIN A DESIGN VARIATION.

14. FLORIDA POWER & LIGHT POWER COMPANY TO ASSIST CONTRACTOR IN PERFORMING ALL NECESSARY WORK UNDER THEIR POWER LINES, SUCH AS THE INSTALLATION OF SPAN WIRE, SIGNAL CABLE, FIBERGLASS INSULATORS AND SIGNAL POLES. CONTRACTOR SHALL NOTIFY THE POWER COMPANY AT LEAST THREE (3) FULL BUSINESS DAYS PRIOR TO INSTALLATION OF THIS EQUIPMENT.

15. THE CONTRACTOR IS RESPONSIBLE TO CONTACT MANATEE COUNTY AT 941-749-3502, FOR THE ASSIGNMENT OF THE PHYSICAL ADDRESS ONCE THE SERVICE DROP LOCATION HAS BEEN ESTABLISHED.

16. EXTREME CARE TO BE TAKEN TO INSURE THAT ALL SIGNAL EQUIPMENT IS INSTALLED AS SHOWN IN PLANS WITHIN EXISTING RIGHT-OF-WAY. IN THE EVENT THAT EXISTING UTILITIES OR OTHER PHYSICAL CONDITIONS NECESSITATE INSTALLATION OF ANY SIGNAL EQUIPMENT OUTSIDE OF RIGHT-OF-WAY, IT WILL BE THE RESPONSIBILITY OF THE PERMITTEE TO ACQUIRE ALL NECESSARY LEGAL, PERPETUAL EASEMENTS PRIOR TO INSTALLATION OF SAID EQUIPMENT.

INFORMATION REQUIRED FOR ACQUISITION OF EASEMENTS CONSISTS OF:

1.A SURVEY SKETCH OF THE AREA TO BE DONATED, WHICH IS PREPARED AND CERTIFIED BY A LICENSED PROFESSIONAL LAND SURVEYOR.

2.A TITLE SEARCH (LESS THAN SIX MONTHS OLD) CERTIFIED BY AN ABSTRACT COMPANY WHICH RELATES TO THE PARENT TRACT OF THE PARCEL TO BE DONATED TO THE DEPARTMENT.

COPIES OF THESE EASEMENTS SHALL BE SENT TO:

TRAFFIC SIGNAL DESIGN ENGINEER
ASSISTANT DISTRICT TRAFFIC OPERATIONS ENGINEER
FLORIDA DEPARTMENT OF TRANSPORTATION
P.O. BOX 1249
801 N. BROADWAY
BARTON, FL. 33831

17. FOR REMOVED SIGNAL EQUIPMENT CLAIMED BY MAINTAINING AGENCY CONTACT:

MANATEE COUNTY
TRAFFIC OPERATIONS DIVISION
2404 12TH STREET COURT EAST
BRADENTON, FLORIDA 34208

18. WORK ZONE TRAFFIC CONTROL

- A. THE CRITERIA AS OUTLINED IN THE "MINIMUM SPECIFICATIONS FOR TRAFFIC CONTROL SIGNALS AND DEVICES", SHALL BE ADHERED TO FOR SIGNAL WORK. MAINTAIN TRAFFIC BY USE OF TRAFFIC CONTROL INDEXES IN THE F.D.O.T. ROADWAY TRAFFIC DESIGN STANDARDS BOOKLET DATED JANUARY 2000. NO LANE CLOSURES WILL BE ALLOWED BETWEEN 6:00 A.M. AND 9:00 A.M. AND BETWEEN 4:00 P.M. AND 7:00 P.M.

- B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING SAFE AND EFFICIENT OPERATION DURING SIGNAL INSTALLATION.

19. THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE BASED ON LIMITED INVESTIGATION TECHNIQUES AND SHOULD BE CONSIDERED APPROXIMATE ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS OF ALL UTILITIES.

20. EXISTING UTILITIES ARE TO REMAIN IN PLACE UNLESS OTHERWISE NOTED.

21. THE CONTRACTOR TO NOTIFY UTILITY OWNERS OF ANY EXCAVATION OR DEMOLITION ACTIVITY THROUGH SUNSHINE ONE CALL OF FLORIDA INC. (1-800-432-4770) AND SHALL ALSO NOTIFY THOSE UTILITY OWNERS/ AGENCIES LISTED WITHIN OR IMPACTED BY THESE PLANS, NOT LESS THAN TWO (2) FULL BUSINESS DAYS IN ADVANCE OF BEGINNING CONSTRUCTION ON THE JOB SITE.

22. THE CONTRACTOR SHALL HAND DIG THE FIRST 48 INCHES (4 FEET) OF THE HOLE FOR THE POLE FOUNDATION OR CONDUIT RUN WHERE UTILITIES ARE IN CLOSE PROXIMITY.

23. IT SHOULD BE NOTED THAT NO TEST BORINGS WERE MADE WHERE CONDUIT RUNS ARE TO BE INSTALLED BY JACKING OR BORING.

24. THE TYPE OF EQUIPMENT USED IN THE INSTALLATION OF MAST ARMS/ FOUNDATIONS, OVERHEAD CANTILEVER SIGNS/ FOUNDATIONS, AND THE MOVEMENT/INSTALLATION OF STRAIN POLES SHALL MEET THE FOLLOWING REQUIREMENTS: 1) OVERHEAD LINES SHALL STAY IN PLACE BOTH VERTICALLY AND HORIZONTALLY AND; 2) CONTRACTOR SHALL MEET ALL LATEST APPLICABLE OSHA REQUIREMENTS ANY COST ASSOCIATED WITH THE TYPE OF EQUIPMENT REQUIRED FOR THIS INSTALLATION IS INCLUDED IN THE RELATED PAY ITEMS.

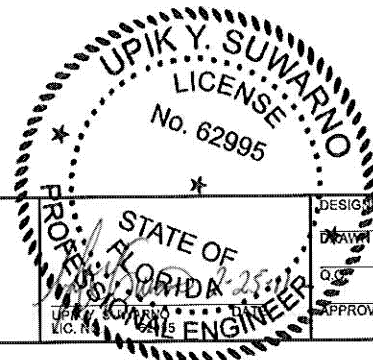
25. THE CONTRACTOR SHALL COORDINATE WITH MANATEE COUNTY TRAFFIC ENGINEERING DIVISION ABOUT THE ON GOING MANATEE ATMS PROJECT THAT INCLUDES THIS INTERSECTION PRIOR TO START OF CONSTRUCTION AND ORDERING MATERIAL.

26. THE CONTRACTOR SHALL FIELD VERIFY ALL CRITICAL ELEVATIONS PRIOR TO ORDERING MAST ARMS.

27. DETECTION MUST BE MAINTAINED FOR PEDESTRIANS AND THE SIDE STREETS FOR THE LIFE OF THE PROJECT.

MANATEE COUNTY

CORTEZ ROAD AND
43RD STREET WEST



DESIGNED JTP
DRAWN JTP
CHECKED OJA
APPROVED UYS

GENERAL NOTES

PROJECT NO:
00193-008-05
DATE:
02-25-11
SHEET NO:
T-3

PAY ITEM FOOTNOTES :

1. 555-1-2:
COST FOR PULL WIRE IS INCLUDED UNDER THIS PAY ITEM.
USE A MINIMUM OF 3" DIAMETER CONDUIT FOR FIBER OPTIC INTERCONNECT CABLE.
USE A MINIMUM 2" DIAMETER PVC CONDUIT FOR ALL SIGNAL, PEDESTRIAN, AND
DETECTION FUNCTIONS.
2. 630-1-12, 630-1-13:
COST FOR PULL WIRE IS INCLUDED UNDER THIS PAY ITEM.
USE A MINIMUM OF 3" DIAMETER CONDUIT FOR FIBER OPTIC INTERCONNECT CABLE.
USE A MINIMUM 2" DIAMETER PVC CONDUIT FOR ALL SIGNAL, PEDESTRIAN, AND
DETECTION FUNCTIONS.
PAYMENT SHALL INCLUDE THE COST OF TRENCHING AND ALL CONDUIT IN
TRENCH.
3. 632-7-1:
VERIFY THE COLOR CODE OF SIGNAL CABLE WITH THE MAINTAINING AGENCY PRIOR TO
WIRING INTERSECTION. USE A MINIMUM OF 7 CONDUCTOR SIGNAL CABLE FOR SIGNAL
HEADS AND PEDESTRIAN HEADS.
4. 635-1-11:
ALL PULL BOXES AND LIDS SHALL BE OF TRAFFIC BEARING, POLYMER CONCRETE
CONSTRUCTION.
PULL BOXES ARE TO BE PLACED BEHIND CURB AND GUTTER. IF THERE IS NO
CURB AND GUTTER, PULL BOXES SHALL BE PLACED A MINIMUM OF 7 FEET FROM
THE EDGE OF THE PAVEMENT. THE TOP OF THE LID SHALL READ "TRAFFIC SIGNAL"
IN STAMPED RAISED LETTERS.

USE POLYMER CONCRETE PULL BOX WITH A POLYMER CONCRETE, COVER MARKED
"TRAFFIC SIGNAL" FOR FIBER COMMUNICATION AND/OR INTERCONNECT CABLE.
USE 24" X 36" PULL BOXES PLACED A MINIMUM OF 800' APART.
APPROPRIATELY SIZE EACH PULL BOX SO THE FIBER COMMUNICATION AND/OR INTERCONNECT
CABLE DOES NOT EXCEED MANUFACTURER'S RECOMMENDED BENDING RADIUS.
5. 639-1-22:
AN ADDITIONAL BREAKER SHALL BE ADDED FOR THE POWER TO THE CCTV.
THE BREAKERS SHALL BE CLEARLY MARKED. THE ELECTRICAL SERVICE DISCONNECT
IS 100 AMP, COMPRISING OF A SIX (6) CIRCUIT DISCONNECT BOX WITH THREE CIRCUIT
BREAKERS - ONE 50 AMP/120 VOLT FOR CONTROLLER/INTERNALLY ILLUMINATED STREET
NAME SIGN, ONE 15 AMP/120 VOLT FOR FUTURE USE, ONE 50 AMP/120 VOLT FOR THE CCTV.

USE ALUMINUM RIGID ABOVE GROUND CONDUIT FOR ELECTRICAL POWER SERVICE.
6. 639-2-1:
PAYMENT SHALL BE BASED ON THE LINEAR FOOT OF
A SINGLE CONDUCTOR.
7. 649-31-202 & 649-31-203:
USE THREE 2" AND ONE 3/4" CONDUITS STUBBED OUT THROUGH THE MAST
ARM POLE FOUNDATION AND TEMPORARILY SEAL.
8. 650-51-311 & 650-51-511:
USE SIGNAL HEAD SUPPORTING TUBE THAT IS CAPABLE OF ADJUSTING
VERTICALLY A MINIMUM OF 1.5 FEET.

DO NOT USE PLASTIC GARBAGE BAGS AS A COVERING FOR CONCEALNG SIGNAL HEADS.
9. 653-191:
PEDESTRIAN SIGNAL HEADS TO BE 16" INTERNATIONAL SYMBOL, LED
COUNTDOWN TYPE.
10. 659-101 AND 659-118:
USE LOUVERED ALUMINUM SIGNAL HEAD BACK PLATES WITH A 2 INCH
YELLOW REFLECTORIZED (TYPE III REFLECTIVITY) OUTER EDGE BORDER.
11. 659-107:
USE BREAKAWAY ALUMINUM SQUARE BASE ASSEMBLIES WITH ALUMINUM DOORS
FOR PEDESTRIAN PEDESTALS. INSIDE DIAMETER OF PEDESTALS SHALL
BE FOUR INCHES (4").

USE LOCKING COLLARS WHEN MOUNTING PEDESTRIAN SIGNAL HEADS TO
PEDESTRIAN PEDESTALS. USE LOCKING COLLARS WHEN MOUNTING ALUMINUM
PEDESTRIAN POLES TO PEDESTRIAN PEDESTAL BASES.
12. 665-13:
USE PEDESTRIAN BUTTON SIGNAL SIGN FTP-68B-06. STREET NAME
SHALL BE IN ACCORDANCE WITH THE STREET NAMES SHOWN
ON THE SIGNALIZATION PLAN SHEETS.
13. 685-106:
INCLUDE AN UNINTERRUPTED POWER SUPPLY UNIT (UPS) WITH AN 8 HOUR RUN TIME
AT 450 WATTS. ATTACH UPS UNIT TO THE OUTSIDE OF THE CONTROLLER CABINET.
INSTALL UPS UNIT IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
14. 699-1-1:
USE LED INTERNALLY ILLUMINATED STREET NAME SIGNS.

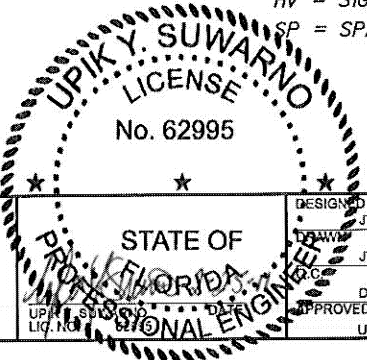
15. 670-5-110:
BASE OF CONTROLLER TO BE SAME ELEVATION AS CENTER OF ROADWAY OR
GREATER.



USE A TS2 TYPE I CONTROLLER WITH A TYPE V CABINET. ALL
CONTROLLER EQUIPMENT TO BE COMPATIBLE WITH MANATEE COUNTY'S
EXISTING ATMS SYSTEM (NAZTEC'S ATMS.NOW). CONTACT MAINTAINING
AGENCY PRIOR TO ORDERING CONTROLLER ASSEMBLY TO CONFIRM
EQUIPMENT COMPATIBILITY.

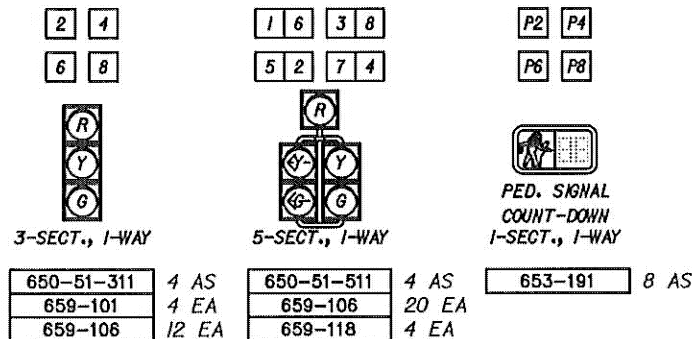
THE CONTRACTOR SHALL COORDINATE WITH MANATEE COUNTY TO PICK
UP AND INSTALL THE GENERATOR CABINET ON THE NEW FOUNDATION.
ALL COSTS OF LABOR, CONCRETE AND OTHER MATERIALS FOR THE
CONTROLLER ASSEMBLY AND EGC BASES, TECHNICIAN PADS, STEPS AS
REQUIRED, AND INSTALLATION OF THE GENERATOR CABINET ARE
INCLUDED IN THIS ITEM.THE CONTROLLER AND EGC BASE SHALL BE AT
LEAST 2' HIGH OR THE SAME ELEVATION AS THE CROWN OF THE
ROADWAY, WHICHEVER IS GREATER. THE MAXIMUM DISTANCE FROM
THE TECHNICIAN PAD OR STEP TO THE FOUNDATION TOP IS 4". THE
CABINET DOORS SHALL OPEN TOWARDS OR PARALLEL TO THE RIGHT-OF-
WAY LINE AND AWAY FROM TRAFFIC.

CONDUIT LEGEND

LV = SIGNAL LOW VOLTAGE CONDUIT (INCLUDES VID CABLE)
HV = SIGNAL HIGH VOLTAGE CONDUIT
SP = SPARE CONDUIT



				MANATEE COUNTY		CORTEZ ROAD AND 43RD STREET WEST		 12481 Telecom Drive, Tampa, Florida 33637 www.cardnotbe.com - 813.221.0048 Certificate of Authorization No. 3843		 STATE OF FLORIDA PROFESSIONAL ENGINEER DESIGNED JTP DRAWN JTP CHECKED DJA APPROVED UYS UPON SUBMISSION LIC. NO. 12481		PAY ITEM FOOTNOTES		PROJECT NO: 00193-008-05 DATE: 02-25-11 SHEET NO: T-4	
NO.	DESCRIPTION	BY	DATE												



* SIGNAL BACKPLATES SHALL BE PROVIDED WITH YELLOW RETRO-REFLECTIVE BORDER MATERIAL

CONTROLLER NOTES:

1. MAJOR STREET IS CORTEZ RD. WEST (MOVEMENTS 1, 2, 5 & 6). MINOR STREET IS 43RD ST. WEST (MOVEMENTS 3, 4, 7 & 8).
2. THE CONTROLLER CABINET SHALL BE WIRED FOR SOP 10.
3. FLASHING OPERATION IS YELLOW FOR MOVEMENTS 2 & 6 AND RED FOR ALL OTHER MOVEMENTS.
4. EACH PHASE/ MOVEMENT SHALL BE WIRED FROM THE SIGNAL DISPLAY TO THE CONTROLLER AS A SEPARATE PHASE/ MOVEMENT. THIS INCLUDES LEFT TURN MOVEMENTS. EACH LEFT TURN MOVEMENT SHALL HAVE CONDUCTORS AVAILABLE FOR PROTECTED AND PERMISSIVE OPERATION.
5. THE SIGNAL SHALL BE INCORPORATED INTO THE MANATEE COUNTY ATMS SYSTEM.

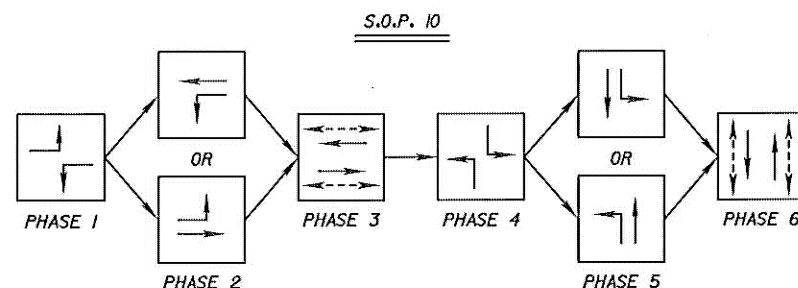
SIGNAL HEAD LEGEND:

PROPOSED SIGNAL HEAD

REMOVAL NOTE:
REMOVE ENTIRE EXISTING SIGNAL SYSTEM

REMOVAL ITEMS:

690-10	8 EA
690-34-1	2 EA
690-50	1 EA
690-60	10 EA
690-80	1 EA
690-90	1 PI
690-100	1 PI
700-48-60	3 EA



CONTROLLER TIMINGS

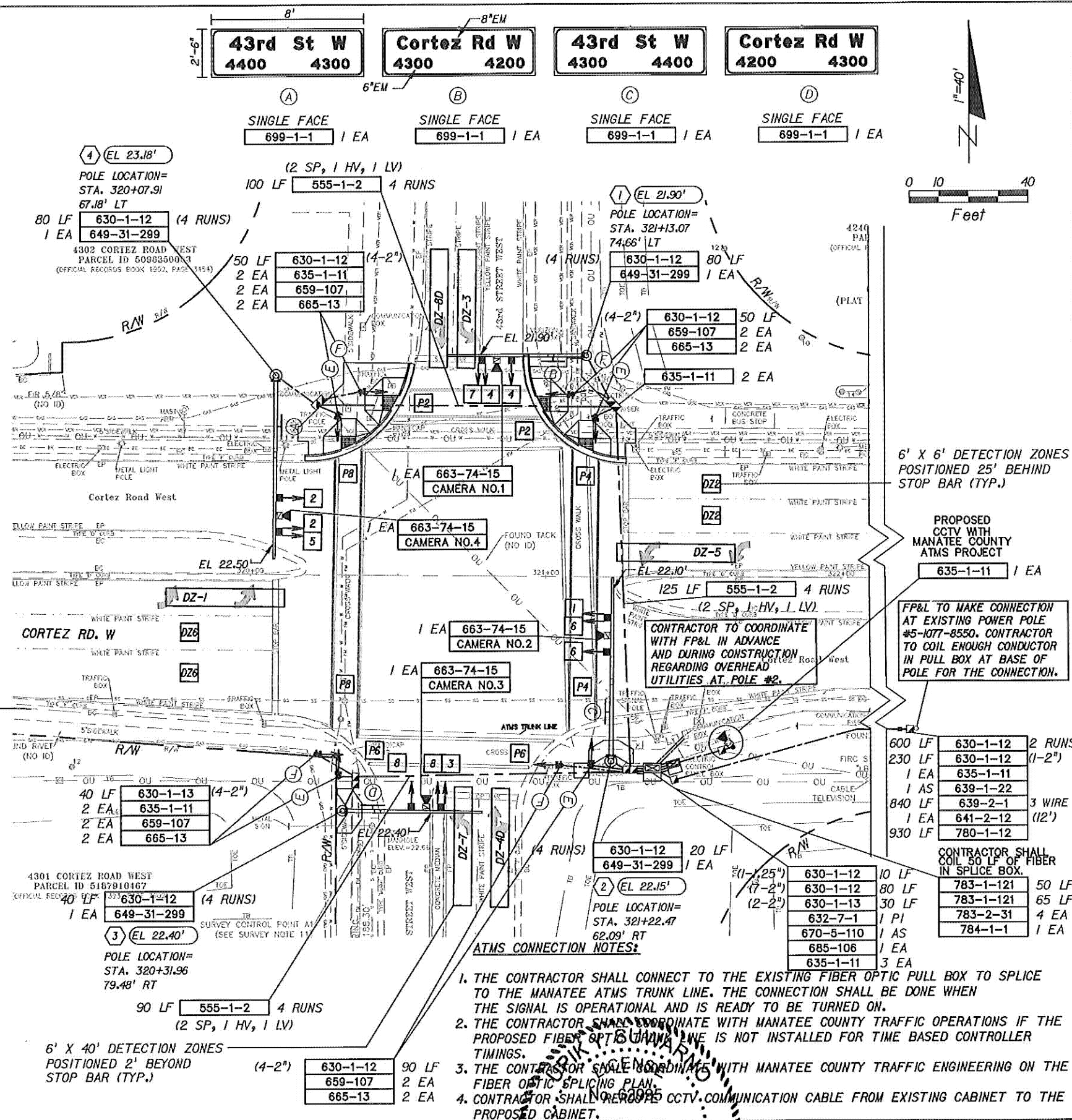
TIMING FUNCTION	1	2	3	4	5	6	7	8
MOVEMENT NUMBER	1	2	3	4	5	6	7	8
MINIMUM GREEN	7	20	7	7	7	20	7	7
EXTENSION	3.0	3.0	3.0	4.0	3.0	3.0	3.0	4.0
MAXIMUM GREEN 1	12	30	20	18	12	30	20	18
MAXIMUM GREEN 2	25	50	35	60	25	50	35	60
YELLOW CLEARANCE	3.0	4.3	3.0	4.0	3.0	4.3	3.0	4.0
ALL RED	4.5	2.0	4.2	2.7	4.5	2.0	4.2	2.7
PEDESTRIAN WALK		7		7		7		7
PED. CLEARANCE		25		32		25		32
RECALL		MIN				MIN		

TIMINGS ARE INITIAL AND MAY REQUIRE FIELD ADJUSTING AS DIRECTED BY PROJECT ENGINEER.

VIDEO DETECTOR ZONES

ZONE LOCATION NO.	VIDEO CAMERA NO.	NO. OF DETECTION ZONES	DELAY TIME (SEC)
DZ-1	2	1	0
DZ-2	4	2	0
DZ-3	3	1	0
DZ-4D	1	1	5
DZ-5	4	1	0
DZ-6	2	2	0
DZ-7	1	1	0
DZ-8D	3	1	5

DELAY TIME IS INITIAL AND MAY REQUIRE FIELD ADJUSTING AS DIRECTED BY PROJECT ENGINEER.



MANATEE COUNTY

CORTEZ ROAD AND 43RD STREET WEST

Cardno TBE
12481 Telecom Drive, Tampa, Florida 33637
www.cardnotbe.com - 813.221.0048
Certificate of Authorization No. 3843

DESIGNED JTP
DRAWN JTP
STATE OF FLORIDA
PROFESSIONAL ENGINEER
UPIN Y. SUWARNO
LIC/NO.: 62995

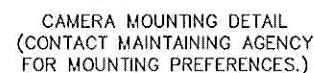
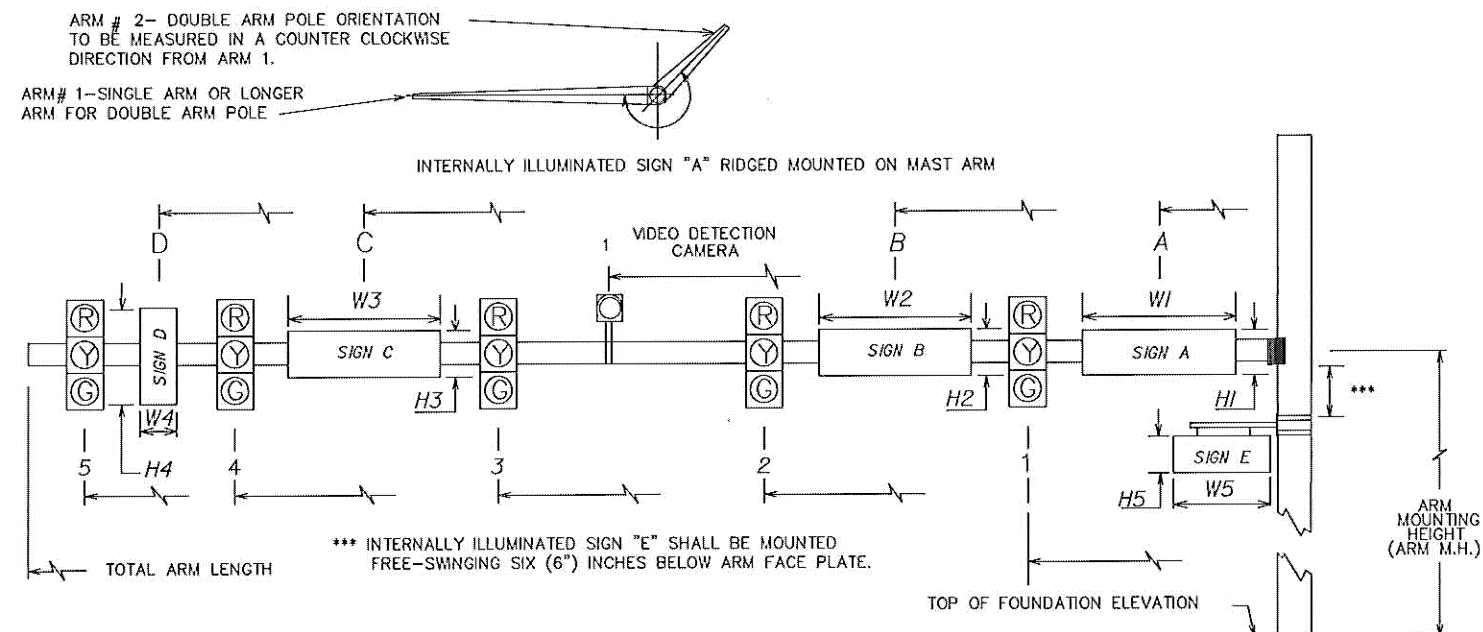
SIGNALIZATION PLAN

PROJECT NO: 00193-008-05
DATE: 02-25-11
SHEET NO: T-5

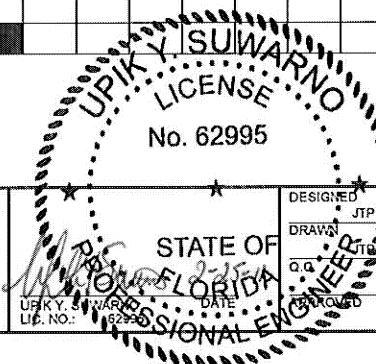
- A. EACH POLE AND MAST ARM SHALL BE IDENTIFIED WITH A PERMANENT ONE INCH (1") HIGH ENGRAVED OR IMPRESSED MARK WHICH BEARS THE POLE IDENTIFICATION NUMBER SHOWN ON THE PLANS.
- B. ANCHOR BOLT COVERS (ORNAMENTAL, NON-ORNAMENTAL, AND/OR PAINTED) SHALL BE GALVANIZED STEEL OR CAST ALUMINUM AND SHALL BE SECURED BY A MINIMUM OF TWO (2) THREADED FASTENERS. THE BOLT COVERS SHALL BE OF SUFFICIENT SIZE SO THAT THERE IS NO GAP BETWEEN ITSELF AND THE POLE SHAFT.
- C. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO FIELD VERIFY ALL ELEVATIONS LISTED HEREIN.



Diagram illustrating the Pole Foundation Detail. The diagram shows a cross-section of a pole foundation. Key components and labels include:

- CRITICAL ROAD ELEVATION (HIGHEST POINT OF ROADWAY UNDER SIGNALS)**: Indicated by a line pointing to the highest point of the roadway profile.
- TOP OF FOUNDATION ELEVATION. ****: Indicated by a line pointing to the top of the foundation structure.
- WIRE SCREEN**: A component located above the foundation, indicated by a line.
- 6"**: A dimension indicating the height of the wire screen above the foundation top.
- POLE FOUNDATION DETAIL**: The title of the diagram, underlined.

[illegible]

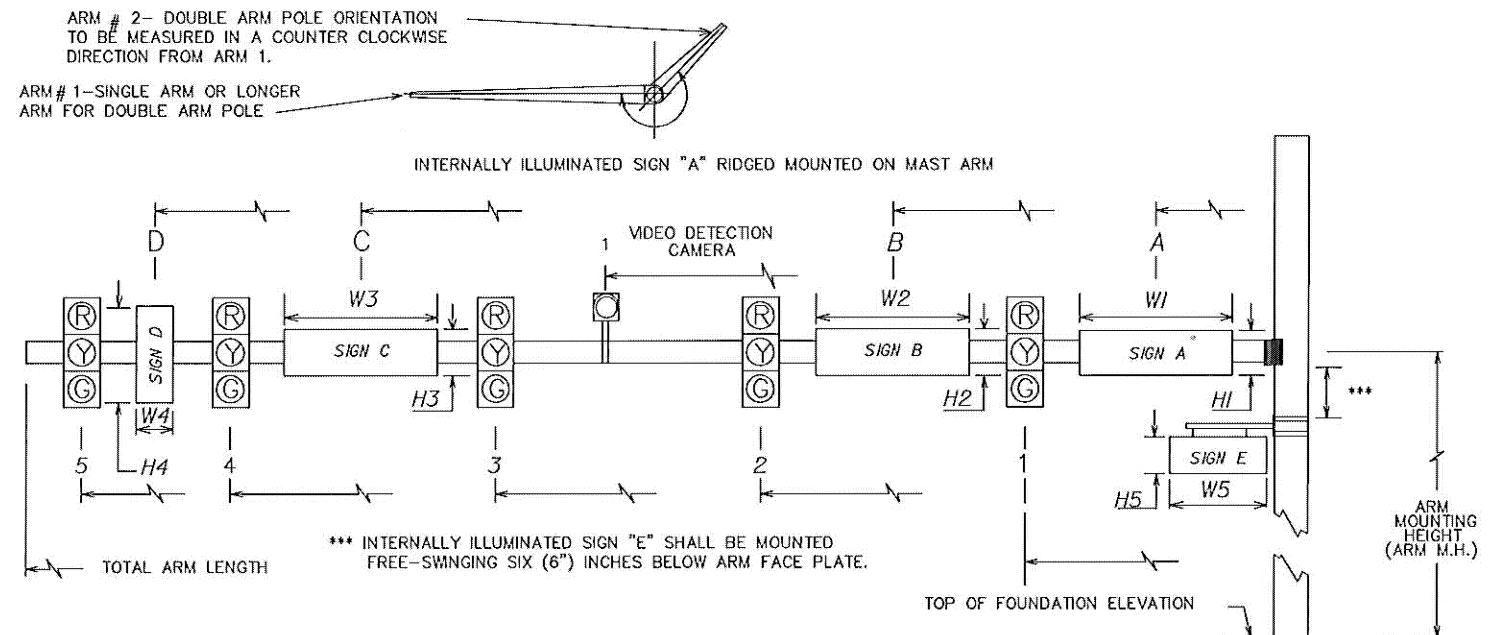
							SIGNAL DATA																		SIGN DATA																		VIDEO								
STRUCT. ID. NO.	POLE ID. NO.	SHEET NO.	LOCATION BY STA.	CRITICAL ROAD EL.	# FOUNDATION OUT OF GROUND	** TOP OF FOUNDATION ELEVATION	RDNY ARM NO.	SIGNAL V/H	BACK PLATES Y/N	PED. SIGNAL Y/N	DISTANCE FROM POLE																		TOTAL ARM LENGTH	ARM M.H.	L BETWEEN DUAL ARMS 90/270	DISTANCE FROM POLE / HEIGHT AND WIDTH OF SIGN																		DISTANCE FROM POLE	
											1	*	2	*	3	*	4	*	5	*	6	*	7	*	8	*	A	H1				W1	B	H2	W2	C	H3	W3	D	H4	W4	E	H5	W5	1	2					
13M126	1	T-5	321+13.07	21.90'	0.5	21.90'	A	V	Y	N	24.0	3	34.0	5												46	20.0		10.0	2.5	8													29							
					-		B	V	Y	N																-																									
13M126	2	T-5	321+22.47	22.10'	0.5	22.15'	B	V	Y	N	35.0	3	46.5	5												60	20.0		15.0	2.5	8												40.5								
					-	-	A	V	Y	N																-																									
13M126	3	T-5	320+31.96	22.40'	0.5	22.40'	A	V	Y	N	22.0	3	32.0	5												46	20.0		9.0	2.5	8												27								
					-	-	B	V	Y	N																-																									
13M126	4	T-5	320+07.91	22.50'	0.5	23.18'	A	V	Y	N	39.5	3	51	5												60	20.0	-	15.5	2.5	8												45.5								
					-	-	B	-	-	-																-																									
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				MANATEE COUNTY		CORTEZ ROAD AND 43RD STREET WEST		 12481 Telecom Drive, Tampa, Florida 33637 www.cardno.com - 813 221 0048 Certificate of Authorization No. 3843		 DESIGNED: JTP DRAWN: JTP Q.C.: JTP DATE: 2-25-11 CHECKED: JTP		MAST ARM TABULATION		PROJECT NO. 00193-008-05 DATE: 02-25-11 SHEET NO: T-6	
NO.	DESCRIPTION	BY	DATE												

- A. EACH POLE AND MAST ARM SHALL BE IDENTIFIED WITH A PERMANENT ONE INCH (1") HIGH ENGRAVED OR IMPRESSED MARK WHICH BEARS THE POLE IDENTIFICATION NUMBER SHOWN ON THE PLANS.
- B. ANCHOR BOLT COVERS (ORNAMENTAL, NON-ORNAMENTAL, AND/OR PAINTED) SHALL BE GALVANIZED STEEL OR CAST ALUMINUM AND SHALL BE SECURED BY A MINIMUM OF TWO (2) THREADED FASTENERS. THE BOLT COVERS SHALL BE OF SUFFICIENT SIZE SO THAT THERE IS NO GAP BETWEEN ITSELF AND THE POLE SHAFT.
- C. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO FIELD VERIFY ALL ELEVATIONS LISTED HEREIN.

F. BACKPLATES REQUIRED FOR ALL SIGNALS HEADS.

[illegible]

UPK Y SUWARNO
LICENSE
No. 62995
SIGNALS AND/OR SIGNS.
★
STATE OF FLORIDA
PROFESSIONAL ENGINEER
UPK Y SUWARNO
LIC. NO. 62995
DATE 2/25/88
DESIGNED BY
DRAWN BY
APPROVED BY

				MANATEE COUNTY		CORTEZ ROAD AND 43RD STREET WEST		 Cardno TBE 12481 Telecom Drive, Tampa, Florida 33637 www.cardnotbe.com - 813.221.0048 Certificate of Authorization No. 3843				MAST ARM TABULATION (CALCULATION CONFIGURATION)		PROJECT NO: 00193-008-05 DATE: 02-25-11 SHEET NO: T-7	
NO.	DESCRIPTION	BY	DATE							DESIGNED JTP					
										DRAWN JTP					
										CHECKED JTP					
										APPROVED					

[illegible][illegible][illegible]

NOTES:

1. *Work with Index 17745.*
2. *Design Wind Speed = 130 mph.*
3. *Contractor shall coordinate anchor bolt requirements with fabricator.*
4. *Contractor shall identify Structures Numbers and submit detailed shop drawings.*

FOUNDATION NOTES:

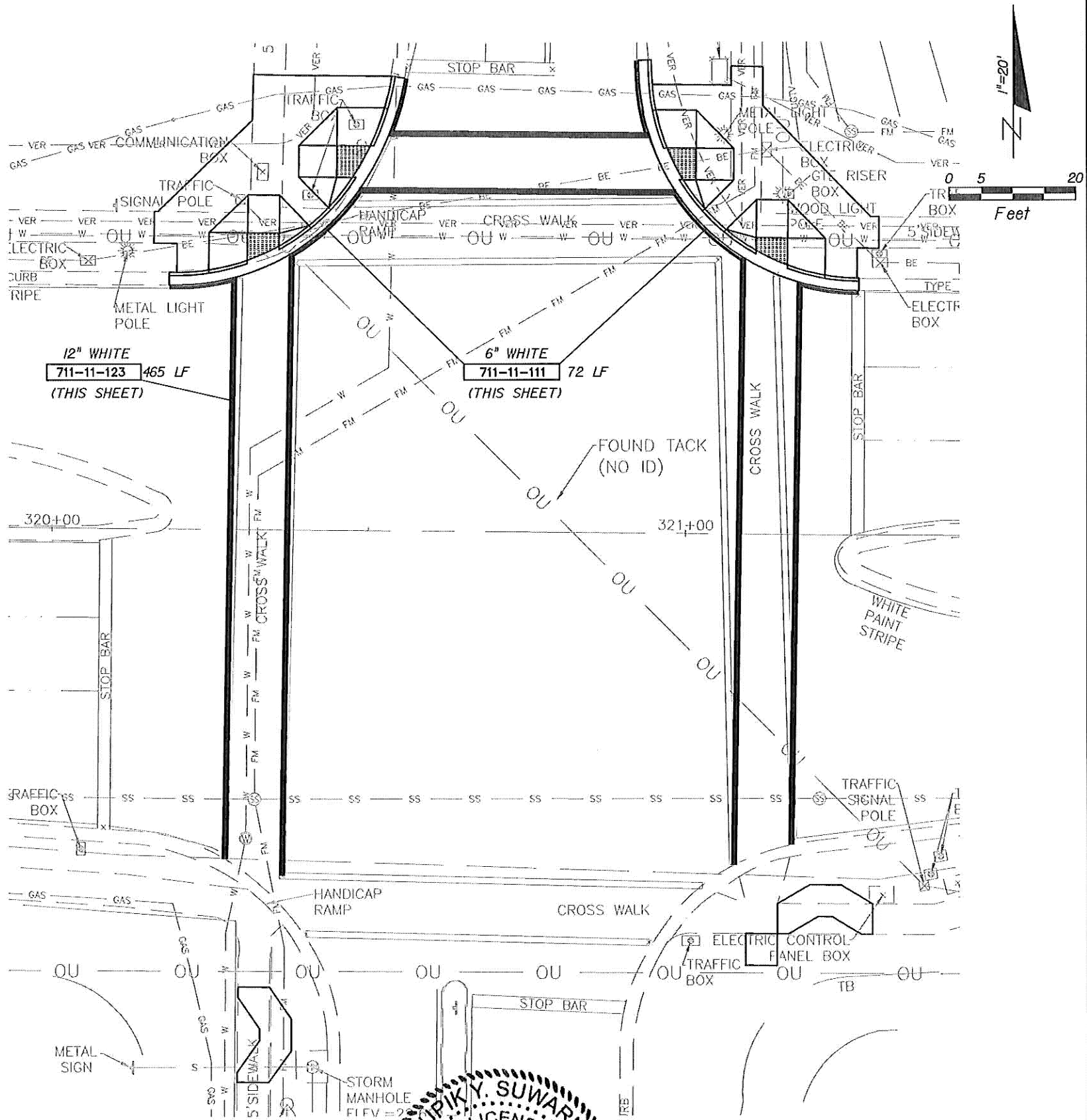
1. Design based on Borings taken and sealed by Martin E. Millburg, P.E. with Professional Service Industries, Inc.
2. Assumptions and Values used in design:
 - Soil Type = Sand.
 - Soil Layer Thickness = 20 ft.
 - Soil Friction Angle = 30 deg.
 - Soil Weight = 42.6 pcf.
 - Design Water Table is 0.0 ft. below surface.

[illegible]

NOTES:

1. THE CONTRACTOR SHALL REMOVE ALL THE EXISTING MARKINGS BEING REPLACED.

711-17 525 SF
(THIS SHEET)



NO.	DESCRIPTION	BY	DATE

MANATEE COUNTY

CORTEZ ROAD WEST AND
43RD STREET WEST

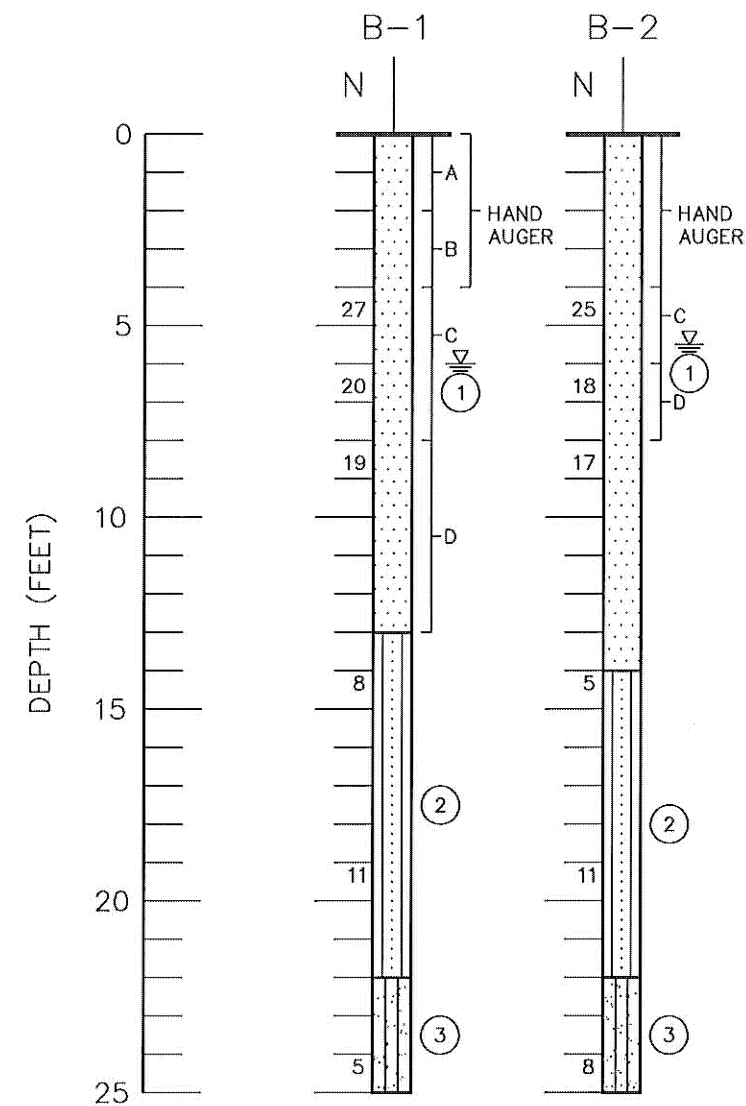
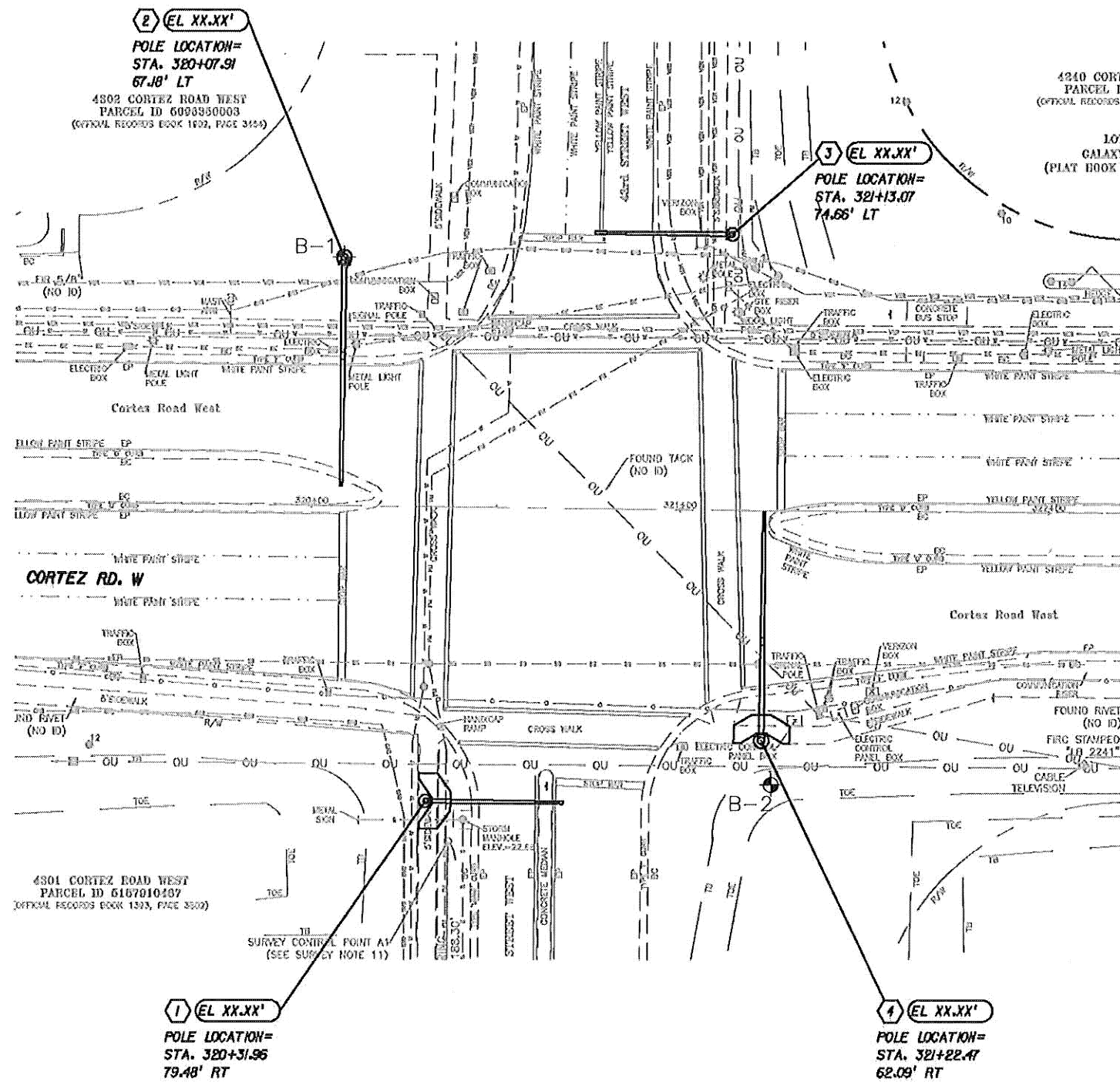
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www.cardnotbe.com - 813 221.0048
Certificate of Authorization No. 3843

UPRIY. SUWARNO
LICENSE
No. 62995
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

DESIGNED	JTP
DRAWN	JTP
CHECKED	JTP
APPROVED	JTP

PAVEMENT MARKING PLAN

PROJECT NO:	00193-008-05
DATE:	02-25-11
SHEET NO:	T-9



LEGEND

- ① Light to dark brown, gray fine SAND to slightly silty fine SAND (SP/SP-SM)
- ② Silty to Sandy Shell fragments (SP-SM)
- ③ Shell fragments with silty SAND (Bay Bottom) (SM)

Unified Soil Classification System (ASTM D 2487) group symbol as determined by visual review

▽ Groundwater level, August 2010

N SPT N-value in blows/foot

A With gravel fragments

B With trace roots

C Organic staining

D With trace organics

⊕ Approximate SPT boring location

DRAWN	DJG
CHECKED	JH
APPROVED	MEM
SCALE	NOTED

GEOTECHNICAL SERVICES MAST ARM SIGNAL POLES CORTEZ ROAD WEST & 43RD STREET WEST BRADENTON, FLORIDA		
psi Information To Build On Engineering • Consulting • Testing		
DATE	AUG 10	PROJ. NO. 0775733
		SHEET T-12