



Advertise Date: Friday, March 15, 2019

Lee County Board of County Commissioners
DEPARTMENT OF PROCUREMENT MANAGEMENT

Invitation to Bid (B)
DOT Construction Only

Solicitation No.: **B190142TJM**

Solicitation Name: **Bridge Maintenance and Repairs- Annual**

Open Date/Time: **Monday, April 16, 2018** Time: **2:30 PM**

Location: Lee County Procurement Management
1500 Monroe Street 4th Floor
Fort Myers, FL 33901

Procurement Contact: **Tara McMahon** Title Procurement Analyst

Phone: (239) 533-8881 Email: tmcmahon@leegov.com

Requesting Dept. Transportation

Pre-Bid Conference:

Type: NON-Mandatory

Date/Time: 4/4/2019 10:00 AM

Procurement: Public Works Building, 1500 Monroe St 4th Floor, Fort Myers, FL

Location: 33901

All solicitation documents are available for download at
www.leegov.com/procurement



Advertisement Date: Friday, March 15, 2019

INTRODUCTION AND BACKGROUND

Notice to Bidder

Invitation to Bid # B190142TJM Bridge Maintenance and Repairs- Annual

Invitation to Bid (B) Construction

Lee County, Florida, is requesting bids from qualified individuals/firms for

Bridge Maintenance and Repairs-Annual.

Then and there to be publicly opened and read aloud for the purpose of selecting a vendor to furnish all necessary labor, services, materials, equipment, tools, consumables, transportation, skills and incidentals required for Lee County, Florida, in conformance with the Solicitation Documents, which include technical Specifications and/or a Scope of Work.

Those individuals/firms interested in being considered for this Solicitation are instructed to submit, in accordance with the Specifications, their Bids, pertinent to this project prior to

2:30 PM Tuesday, April 16, 2019

to the office of the **Procurement Management Director, 1500 Monroe Street, 4th Floor, Fort Myers, Florida 33901.** The Invitation to Bid shall be received in a sealed envelope, prior to the time scheduled to receive Bid(s), and shall be clearly marked with the Solicitation name, Solicitation number, Bidder name, and contact information as identified in these Solicitation Documents.

The Scope of Work/Specifications for this Solicitation is available from www.leegov.com/procurement. Bidders who obtain the Scope of Work/Specifications from sources other than www.leegov.com/procurement are cautioned that the Solicitation package may be incomplete. The County's official Bidders list, Addendum(s) and information must be obtained from www.leegov.com/procurement. It is the Bidder's responsibility to check for posted information. The County may not accept incomplete Bids.

A Non-Mandatory Pre-Bid Conference has been scheduled for the following time and location:

10:00 AM April 4, 2019 1500 Monroe Street, 4th Floor, Conf. 4D, Fort Myers, FL 33901

for the purpose of discussing the proposed project. Prospective Bidders are encouraged to attend. All prospective Bidders are encouraged to obtain and review plans, Specifications, and Scope of Work for this Bid before the pre-bid conference so that they may be prepared to discuss any question or concerns they have regarding this project. A site visit may follow the pre-bid conference. Questions regarding this Solicitation are to be directed, in writing, to the individual listed below using the email address listed below or faxed to (239) 485-8383 during normal working hours.

Tara McMahon tmcmahon@leegov.com

Sincerely,

Lindsay Cepero, CPPB
Interim Procurement Manager

*WWW.leegov.Com/Procurement is the County's official posting site

Terms and Conditions
INVITATION TO BID (B)
CONSTRUCTION

1. **DEFINITIONS.** Additional definitions may be found in the Draft Construction Agreement attached hereto.
- 1.1. **Addendum/Addenda:** A written document used to modify the terms of a procurement instrument (such as an Invitation to Bid or Request for Proposals). An addendum is not to be confused with a contract "amendment."
 - 1.2. **Approved Alternate:** Solicitation documents may make reference of specific manufacturer(s) or product(s). These references serve only as a recommendation and a guide to minimum quality and performance. The references are not intended to exclude Approved Alternatives of other manufacturer(s) or product(s).
 - 1.3. **Award:** The determination of a successful Bidder(s) in response to this Solicitation.
 - 1.4. **Bid/Proposal Package:** An offer specifically given to the County in response to an informal or competitive procurement invitation issued by the County. This is also referred to as a "Response."
 - 1.5. **Bid Bond/Security:** Security in the form and amount required by the County pledging that the Bidder shall enter into a Contract with the County in accordance with the terms stated in its Bid.
 - 1.6. **Bidder:** Any individual, firm, partnership, joint venture, or corporation submitting a Bid for this project, acting directly or through an authorized representative.
 - 1.7. **County:** The Board of County Commissioners of Lee County, Florida, a political subdivision of the State of Florida, its successors and assigns.
 - 1.8. **Contract/Agreement:** The written contract between the County and a successful Bidder pursuant to this Solicitation, a draft copy of which is attached hereto.
 - 1.9. **Contract Documents:** The documents listed in Section 1 of the attached draft Agreement.
 - 1.10. **Department of Procurement Management:** Shall mean the Lee County Department of Procurement Management.
 - 1.11. **Due Date and Time/Opening:** The date and time upon which a Bid or Proposal shall be submitted to, and actually received by, the Lee County Department of Procurement Management. Only Bids or Proposals received prior to the established date and time shall be considered.
 - 1.12. **Liquidated Damages:** Damages, usually in the form of monetary payment, agreed to by the parties to a contract which are due and payable as damages in the event of a breach of all or part of such contract. Liquidated Damages may be applied on a daily basis for as long as the breach is in effect.
 - 1.13. **Local Bidder:** Any person, firm, partnership, company or corporation whose principal place of business, in the sole opinion of the County, is located within the boundaries of Lee County, Florida; or (b) any person, firm, partnership, company or corporation that has provided goods or services to Lee County on a regular basis for the preceding consecutive three (3) years, and that has the personnel, equipment and materials located within the boundaries of Lee County sufficient to constitute a present ability to perform the service or provide the goods; or (c) any person, firm, partnership, company or corporation that qualifies as a "local business" under the terms of the Collier County Local Vendor Preference Program on or after the date Lee and Collier County enter an agreement extending reciprocity under their respective local vendor preference programs to the firms eligible for those programs in the adjoining county; or (d) any person, firm, partnership, company or corporation that qualifies as a "local bidder" or similar term under the local bidder preference program of any county adjoining Lee County on or after the date Lee County and the adjoining county enter a reciprocity agreement that is substantially similar to any such agreement between Lee and Collier County.
 - 1.14. **Responsible Bidder:** A Bidder submitting a Response who has the capability in all respects to perform fully the Contract requirements and the experience, capacity, facilities, equipment, credit, sufficient qualified personnel, and having the integrity and reliability with a record of timely and acceptable past performance that will ensure good faith performance.
 - 1.15. **Responsive Bidder:** A Bidder submitting a Response that substantially conforms with all material respects to the requirements and criteria set forth in this Solicitation.

- 1.16. Solicitation/Solicitation Documents:** This document, its attachments, and any document hereinafter incorporated by reference.
- 1.17. Work:** All labor, materials, equipment and incidentals required to fully, finally and properly complete the construction project described herein and otherwise fully, finally and properly comply with all terms and conditions of the Contract Documents.
- 2. ORDER OF PRECEDENCE**
- 2.1.** In resolving conflicts, errors, and discrepancies among the provisions of the Contract Documents, the order of precedence shall be as follows
- 2.1.1.** Florida State Law as applied to County Purchasing
 - 2.1.2.** Lee County Procurement Ordinance 18-22
 - 2.1.3.** Change Orders
 - 2.1.4.** Contract/Agreement including amendments and Exhibits
 - 2.1.5.** Field Directive Change Orders
 - 2.1.6.** The Solicitation Documents, including any Addenda
- 3. RULES, REGULATIONS, LAWS, ORDINANCES AND LICENSES**
- 3.1.** It shall be the responsibility of the Bidder to ensure compliance with all federal, state, or county codes, rules, regulations, or other requirements, as each may apply.
- 3.2. Local Business Tax Account:** As applicable, anyone providing merchandise or services to the public within the jurisdiction of Lee County must obtain a Lee County business tax account to operate unless specifically exempted.
- 3.3. License(s):** Bidder should provide, at the time of the opening of the Bid, licenses required for this product and/or service.
- 4. PREPARATION OF SUBMITTAL**
- 4.1. Sealed Bid:** Submission must be in a sealed envelope/box, and the outside of the submission should be marked with the following information (Sealed Bid Label Form is attached for your use):
- 4.1.1.** “Sealed Bid”
 - 4.1.2.** Bid number
 - 4.1.3.** Bid title
 - 4.1.4.** Bid due date
 - 4.1.5.** Name of the Bidder submitting the Bid
 - 4.1.6.** Bidder’s Contact e-mail and telephone number
- 4.2. Bid submission shall:**
- 4.2.1.** Provide two (2) hard copies. Mark one “Original,” one “Copy.”
 - 4.2.2.** Provide one (1) electronic flash drive set of the entire submission documents.
 - 4.2.3.** Provide that the electronic submission document is one single Adobe PDF file in the same order as the original hard copy.
 - 4.2.4.** Limit the color and number of images to avoid unmanageable file sizes.
 - 4.2.5.** Not lock files.
- 4.3. Submission Format:**
- 4.3.1.** Required Forms: complete and return **all** required forms. If the form is not applicable, please return with “Not Applicable” or “N/A” in large letters across the form.
 - 4.3.2.** Failure to submit required or requested information may result in the Bidder being considered non-responsive.
 - 4.3.3.** Execution of Bid: All documents must be signed by a corporate authorized representative, witnessed, and corporate and/or notary seals affixed, where applicable. All Bids shall be typed or printed in ink. The Bidder may not use erasable ink. All corrections made to the Bids shall be initialed.
 - 4.3.4.** The County may request specific files be submitted in specialty format (i.e. Microsoft Excel, PowerPoint etc.). Vendor shall accommodate such specialty requests as stated or described herein. Should files not be provide in the format or quantity as requested Bidder may be deemed Non-Responsive and therefore ineligible for award.

- 4.3.5.** The submission should not contain links to other web pages.
- 4.3.6.** Include any information requested by the County necessary to analyze your Bid, i.e., required submittals, literature, technical data, or financial statements.
- 4.3.7.** Bid Security/Bond(s), as applicable.
- 4.4. Preparation Cost:** The Bidder is solely responsible for any and all costs associated with responding to this Solicitation. No reimbursement shall be made for any costs associated with the preparation and submittal of any Bid, or for any travel and per diem costs that are incurred by any Bidder.
- 5. RESPONSES RECEIVED LATE**
- 5.1.** It shall be the Bidder's sole responsibility to deliver the Bid submission to the Lee County Department of Procurement Management prior to or on the time and date required. All references to date and time herein reference Lee County, FL local time.
- 5.2.** Any Bids received after the stated time and date shall not be considered. Late Bids shall not be opened at the public opening.
- 5.3.** The Lee County Department of Procurement Management shall not be responsible for delays caused by the method of delivery such as, but not limited to: internet, United States Postal Service, overnight express mail service(s), or delays caused by any other occurrence.
- 6. BIDDER REQUIREMENTS (unless otherwise noted)**
- 6.1. Responsive and Responsible Bidders:** Only Bids received from Responsive and Responsible Bidders shall be considered. The County reserves the right, before recommending any Award, to inspect the facilities and organization; or to take any other necessary action, such as background checks, to determine if the Bidder is satisfactorily able to perform, and reserves the right to reject submission packages where evidence submitted or investigation and evaluation indicates an inability for the Bidder to perform.
- 6.1.1.** Additional sources may be utilized to determine credit worthiness and ability to perform.
- 6.1.2.** Any Bidder or sub-contractor that will have access to County facilities or property may be required to be screened to a level that may include, but is not limited to fingerprinting and a statewide criminal background check. There may be fees associated with these procedures. These costs are the responsibility of the Bidder or sub-contractor.
- 6.2. Past Performance:** A Bidder's past performance and prior dealings with Lee County (i.e., failure to meet specifications, poor workmanship, late delivery, etc.) may be reviewed. Poor or unacceptable past performance may result in Bidder disqualification.
- 7. PRE-BID CONFERENCE**
- 7.1.** A pre-bid conference will be held in the location, date, and time specified on the cover of this Solicitation. The cover will also note if the pre-bid conference is non-mandatory or mandatory. All prospective Bidders are encouraged to obtain and review the Solicitation Documents prior to the pre-bid conference so they may be prepared to discuss any questions or concerns they have concerning this project. All questions must be submitted formally in writing to the procurement staff noted on the first page of the Solicitation Documents. A formal response will be provided in the form of an Addendum (see "County Interpretation/Addendums" for additional information). If appropriate, a site visit may follow the pre-bid conference.
- 7.2. Non-Mandatory:** Pre-bid conferences are generally non-mandatory, but it is highly recommended that prospective Bidders participate.
- 7.3. Mandatory:** In the event a mandatory pre-bid conference is held, no Bids shall be considered by Bidders that fail to attend, and a Bid submitted by any such Bidder shall be considered **non-responsive**.
- 8. COUNTY INTERPRETATION/ADDENDUMS**
- 8.1.** Each Bidder shall examine the Solicitation 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 Bid shall be made **in writing, submitted at least eight (8) calendar days prior to the date when the Bid is due**.

- 8.2. Response(s) will be in the form of an Addendum posted on www.lee.gov/procurement. It is solely the Bidder's responsibility to check the website for information. The Lee County Department of Procurement Management will send no notifications regarding postings associated with this solicitation.
- 8.3. All Addenda shall be incorporated into the Contract Documents.
- 8.4. The County shall not be responsible for oral interpretations given by any County employee, representative, agent, or other person. Interpretation of the meaning of the plans, Specifications or any other Contract Document, or for correction of any apparent ambiguity, inconsistency or error there in, shall be in writing. Issuance of a written Addendum by the County's Department of Procurement Management is the only official method whereby interpretation, clarification or additional information may be given.
9. QUALITY GUARANTEE/WARRANTY (as applicable)
- 9.1. Bidder will guarantee their work without disclaimers, unless otherwise specifically approved by the County, for a minimum of twelve (12) months from the date of final completion.
- 9.2. Unless otherwise specifically provided in the specifications, all equipment and materials and articles incorporated in the work covered by this contract shall be new, unused and of the most suitable grade for the purpose intended. Refurbished parts or equipment are not acceptable unless otherwise specified in the specifications. All warranties will begin from the date of final completion.
- 9.3. Unless otherwise specifically provided in the specifications, the equipment must be warranted for twelve (12) months, shipping, parts and labor. Should the equipment be taken out of service for more than forty-eight (48) hours to have warranty work performed, a loaner machine of equal capability or better shall be provided for use until the repaired equipment is returned to service at no additional charge to the County.
- 9.4. If any product does not meet performance representation or other quality assurance representations as published by manufacturers, producers or distributors of such products or the specifications listed, the vendor shall pick up the product from the County at no expense to the County. The County reserves the right to reject any or all materials, if in its judgment the item reflects unsatisfactory workmanship or manufacturing or shipping damage. The vendor shall refund, to the County, any money which has been paid for same.
10. SUBSTITUTION(S)/APPROVED ALTERNATE(S)
- 10.1. 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. If a Bidder wishes to make a substitution in the Specifications, the Bidder shall furnish to the County, **no later than ten (10) business days prior to the Bid opening date**, the name of the manufacturer, the model number, and other identifying data and information necessary to aid the County in evaluating the substitution. Such information is submitted through the Department of Procurement Management. Any such substitution shall be subject to County approval through the issuance of a written Addendum by the County's Department of Procurement Management. Substitutions shall be approved only if determined by the County to be an **Approved Alternate** to the prescribed Specifications.
- 10.2. A Bid containing a substitution is subject to disqualification if the substitution is not approved by the County. Items Bid must be identified by brand name, number, manufacturer and model, and shall include full descriptive information, brochures, and appropriate attachments. Brand names are used for descriptive purposes only. An **Approved Alternate** product or service may be used.
11. ADDITIONS, REVISIONS AND DELETIONS
- 11.1. Additions, revisions, or deletions to the Terms and Conditions, specifications that change the intent of the solicitation will cause the solicitation to be non-responsive and the proposal will not be considered. The Procurement Management Director shall be the sole judge as to whether or not any addition, revision, or deletion changes the intent of the solicitation.

12. NEGOTIATED ITEMS

- 12.1.** Any item not outlined in the Scope of Work/Specifications may be subject to negotiations between the County and the successful Bidder.
- 12.2.** After Award of this Bid, the County reserves the right to add or delete items/services at prices to be negotiated at the time of addition or deletion.
- 12.3.** At contract renewal time(s) or in the event of significant industry wide market changes, the County may negotiate justified adjustments such as price, terms, etc., if in its sole judgment, the County considers such adjustments to be in their best interest.

13. CALCULATION ERRORS

- 13.1.** In the event of multiplication/addition error(s), the unit price shall prevail and the corrected sum shall be considered the bid price. All Bids will be reviewed mathematically and corrected, if necessary, using these standards, prior to further evaluation.

14. CONFIDENTIALITY

- 14.1.** Bidders should be aware that all submissions provided are generally considered public records subject to public disclosure upon conclusion of the Solicitation process, and shall **not** be afforded confidentiality, unless otherwise provided by law.
- 14.2.** If information is submitted with a Bid that is deemed “confidential,” the Bidder must stamp those pages of the submission that are considered confidential. The Bidder must provide sufficient documentation demonstrating why such documents should be deemed confidential in accordance with Florida law.
- 14.3.** Lee County **will not reveal engineering estimates or budget amounts for a project** unless required by grant funding or unless it is in the best interest of the County. Pursuant to § 337.168, F.S.: A document or electronic file revealing the official cost estimate of the department of a project is confidential and exempt from the provisions of § 119.07(1), F.S. until the Contract for the project has been executed or until the project is no longer under active consideration.

15. CONFLICT OF INTEREST

- 15.1. Business Relationship Disclosure Requirement:** The Award hereunder is subject to the provisions of Chapter 112, F.S. All Bidders must disclose with their submission the name of any officer, director or agent who is also an officer or employee of Lee County or any of its agencies or a spouse or child of such officers or employees. Furthermore, all Bidders must disclose the name of any County officers, employees, or spouses or children thereof who own directly or indirectly, an interest of five percent (5%) or more in the Bidder’s firm or any of its branches.

16. ANTI-LOBBYING CLAUSE (Cone of Silence)

- 16.1.** Upon the issuance of the Solicitation, prospective Bidders or any agent, representative or person acting at the request of said Bidder shall not have any contact, communicate with or discuss any matter relating in any way to the Solicitation with any commissioner, evaluation review committee, agent or employee of the County other than the Procurement Management Director or their designee. This prohibition begins with the issuance of any Solicitation, and ends upon issuance of the Notice of Intended Decision, the rejection of all responses, or the termination of this competitive procurement. **If it is determined that improper communications were conducted, the Bidder may be declared non-responsible.**

17. DRUG FREE WORKPLACE

- 17.1.** The County encourages Drug Free Workplace programs.

18. DISADVANTAGED BUSINESS ENTERPRISE (DBE) and MINORITY-OWNED AND WOMEN-OWNED FIRMS (W/MBE)

- 18.1.** The County encourages interested Disadvantaged Business Enterprise Bidder(s) (DBE), as defined and certified by the Florida Department of Transportation, as well as other minority-owned and women-owned

firms, as defined and certified by the State of Florida Office of Supplier Diversity (W/MBE), to do business with the County and respond to this solicitation.

As described in the required forms, the Bidder is required to indicate whether they and/or any proposed sub-contractor(s) are DBEs and W/MBE. Lee County encourages the utilization and participation of DBEs and W/MBE in procurements, and evaluation proceedings will be conducted within the established guidelines regarding equal employment opportunity and nondiscriminatory action based upon the grounds of race, color, sex or national origin. Each bidder that intends to use subcontractors shall also use the State of Florida, and/or when deemed appropriate directories of DBE and W/MBE to solicit for subcontracting opportunities under a primary contract. Each bidder that intends to use subcontractors shall be responsible for documenting outreach activities in accordance with the competitive procurement document.

19. ANTI-DISCRIMINATION/EQUAL EMPLOYMENT OPPORTUNITY

- 19.1. The Bidder agrees to comply, at its own expense, with all federal, state, and local laws and regulations, including federal, state and local laws, codes, statutes, ordinances, rules, regulations and requirements applicable to the Work, including but not limited to those dealing with taxation, workers' compensation, equal employment and safety. Bidder acknowledges and agrees, in accordance with § 287.134, F.S., the Rehabilitation Act of 1973 as amended, the Americans with Disabilities Act of 1990 (ADA), and the ADA Amendments Act of 2008 (ADAAA), that in performing the Work hereunder, no person on the grounds of race, religion, color, age, sex, national origin, disability or marital status shall be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination.
- 19.2. The Bidder shall not discriminate against any employee or applicant for employment because of race, religion, color, age, sex, national origin, disability or marital status. The Bidder shall make affirmative efforts to ensure that applicants are employed and that employees are treated during employment without regard to their race, religion, color, age, sex, national origin, disability or marital status.
- 19.3. The Bidder shall include the provisions of this section in every sub-contract under this Contract to ensure its provisions will be binding upon each sub-contractor. The Bidder shall take such actions in respect to any sub-contractor, as the contracting agency may direct, as a means of enforcing such provisions, including sanctions for non-compliance.
- 19.4. An entity or affiliate who has been placed on the State of Florida's Discriminatory Vendor List (this list may be viewed by going to the Department of Management Services website at <http://www.dms.myflorida.com>) may not submit a Bid on a contract to provide goods or services to a public entity, may not submit a Bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit Bids on leases of real property to a public entity, may not award or perform work as a vendor, supplier, sub-contractor, or consultant under contract with any public entity, and may not transact business with any public entity.

20. SUB-CONTRACTORS

- 20.1. The use of sub-contractors under this Solicitation requires prior written authorization from the County representative.

21. PROJECT GUIDELINES (as applicable)

- 21.1. The County has established the following guidelines, criteria, goals, objectives, constraints, schedule, budget and or requirements which shall serve as a guide to the Bidder(s) in performing the Work provided for pursuant to this Contract:
 - 21.1.1. No amount of Work is guaranteed upon the execution of a Contract.
 - 21.1.2. Rates and all other negotiated expenses shall remain in effect throughout the duration of the Contract period inclusive of any renewals unless otherwise specified herein.
 - 21.1.3. This Contract does not entitle any Bidder to exclusive rights to County contracts. The County reserves the right to perform any and all available required Work in-house or by any other means it so desires.
 - 21.1.4. In reference to vehicle travel, mileage and man-hours spent in travel, time is considered incidental to the Work and not an extra compensable expense.
 - 21.1.5. Lee County reserves the right to add or delete, at any time, any or all material, tasks or services associated with this Contract.

21.1.6. Any Single Large Project: The County, in its sole discretion, reserves the right to separately solicit any project that is outside the scope of this Solicitation, whether through size, complexity or the dollar value.

21.1.7. Background Check(s): The County is committed to maintaining a safe and secure environment. The following shall apply to the contractor, contractor employees, employees hired through a third party staffing vendor, subcontractors and any other staffing that may be working in or around a County Facility, School, Library and other locations as deemed necessary.

Upon written request by Lee County Procurement Management, the contractor at its expense must conduct a background check for each of its employees, as well as for the employees of its subcontractors, who will provide services to the County or have access to the County computer systems, through either onsite or remote access. Contractor employees, for the purpose of this requirement, include such temporary staff as office support, custodial service and any third party vendor. Background checks shall be conducted through the Florida Department of Law Enforcement and provided to Lee County Procurement Management Department at procurement@leegov.com. Background checks must be conducted prior to commencement of said project(s).

22. TIEBREAKER

22.1. Whenever two or more Bids, which are equal with respect to price, quality and service, are received for procurement of commodities or contractual services, from Responsive and Responsible Bidders, the following steps shall be taken to establish the Award to the lowest Bidder. This method shall be used for all ties.

22.1.1. Step 1 - Local Bidder: Between a Local Bidder, and a non-Local Bidder, a Contract Award, or the first opportunity to negotiate, as applicable, shall be made to the Local Bidder. **If local preference is prohibited by the funding source then step 2 will replace step 1.**

22.1.2. Step 2 - Drug Free Workplace: At the conclusion of step 1, if all is equal, the Bidder with a Drug Free Workplace program shall be given preference over a Bidder with no Drug Free Workplace program. The Contract Award, or the first opportunity to negotiate, as applicable, shall be made to the Bidder with the Drug Free Workplace program.

22.1.3. Step 3 - Coin Flip: At the conclusion of Step 1 and Step 2, if all is equal, the Contract Award, or the first opportunity to negotiate, as applicable, the final outcome shall be determined by the flip of a coin.

22.2. When the tie has been broken pursuant to the above procedures, the Contract Award, or the first opportunity to negotiate, as applicable, shall be furnished to the prevailing Bidder.

22.3. If an Award or negotiation is unsuccessful with the initial Bidder, Award or negotiations may commence with the next highest Bidder, utilizing the tiebreaker steps above to make the determination of next lowest Bidder, if necessary.

23. WITHDRAWAL OF BID

23.1. No Bid may be withdrawn for a period of **180 calendar days** after the scheduled time for receiving submissions. A Bid may be withdrawn prior to the Solicitation opening date and time. Withdrawal requests must be made in writing to the Procurement Management Director, who will approve or disapprove the request.

23.2. After submissions are opened, but prior to Award of the Contract by the County Commission, the Procurement Management Director may allow the withdrawal of a Bid because of the mistake of the Bidder in the preparation of the submission document. In such circumstance, the decision of the Procurement Management Director to allow the submission withdrawal, although discretionary, shall be based upon a finding that the Bidder, by clear and convincing evidence, has met each of the following four tests:

23.2.1. The Bidder acted in good faith in submitting the Bid;

23.2.2. The mistake in Bid preparation was of such magnitude that to enforce compliance by the Bidder would cause a severe hardship on the Bidder;

23.2.3. The mistake was not the result of gross negligence or willful inattention by the Bidder; and

23.2.4. The mistake was discovered and was communicated to the County prior to the County Commission having formally Awarded the Contract.

24. PROTEST RIGHTS

- 24.1. Any Bidder that has submitted a formal Response to Lee County, and who is adversely affected by an intended decision with respect to the Award, has the right to protest an intended decision posted by the County as part of the Solicitation process.
- 24.2. Notice of Intended Decision is posted on the Lee County Department of Procurement Management website (www.leegov.com/procurement). Bidders are solely responsible to check for information regarding the Solicitation.
- 24.3. Refer to the “Procurement Protest” section of the Lee County Procurement Ordinance 18-22 for a complete description of the protest process and associated requirements. The ordinance is posted on the Lee County website or may be obtained by contacting the Procurement Management Director.
- 24.4. In order to preserve the right to protest, a written **“Notice Of Intent To File A Protest” must be filed with the Lee County Procurement Management Director within seventy-two (72) hours of Posting of the Notice of Intended Decision.**
 - 24.4.1. The notice shall clearly indicate all grounds being claimed for the protest.
 - 24.4.2. The notice must be physically received by the Procurement Management Director within the required time frame described above. No additional time will be granted for mailing.
- 24.5. Following receipt of the Notice of Intent to File a Protest, a **“Protest Bond”** and **“Formal Written Protest”** must be filed **within ten (10) business days** of Posting of the Notice of Intended Decision.
- 24.6. **Failure to follow the protest procedures requirement within the time frames as prescribed herein and in the Lee County Procurement Ordinance 18-22 shall constitute a waiver of the right to protest and shall bar any resulting claims.**

25. AUTHORITY TO UTILIZE BY OTHER GOVERNMENT ENTITIES

- 25.1. This procurement opportunity is also made available to any government entity. Pursuant to their own governing laws, and subject to the Agreement/Contract of the Bidder, other entities may be permitted to make purchases at the terms and conditions contained herein. The Lee County Board of County Commissioners shall not be financially responsible for the purchases of other entities from this Solicitation.

26. CONTRACT ADMINISTRATION**26.1. Designated Contact:**

- 26.1.1. The Awarded Bidder shall appoint a person(s) to act as a primary contact for all County departments. This person or their designee shall be readily available during normal working hours by phone or in person, and shall be knowledgeable of the terms and procedures involved.
- 26.1.2. Lee County requires that the Awarded Bidder provide the name of a contact person(s) and phone number(s) which will afford Lee County access twenty-four (24) hours per day, 365 days per year, in the event of major breakdowns or natural disasters.

26.2. Basis of Award:

- 26.2.1. The County shall issue a Notice of Intended Decision to the lowest Responsive and Responsible Bidder who submits a Bid.
- 26.2.2. In the event the lowest Responsive and Responsible Bid exceeds the architectural or engineering cost estimates or the amount of available funds, the County Administrator or designee may, when time or economic considerations preclude re-bidding of Work of a reduced scope, negotiate an adjustment of the Scope of Work with the lowest Responsive and Responsible Bidder, in order to bring the Bid within the amount of available funds.
- 26.2.3. The County reserves the right to make Award(s) by individual item, group of items, all or none, or a combination thereof. The County reserves the right to reject any and all Bids or to waive any minor irregularity or technicality in the Bids received. Award shall be made to the lowest Responsible and Responsive Bidder(s) within the category chosen for basis of Award.
- 26.2.4. The County reserves the right to Award to one or multiple Bidders at the discretion of the requesting authority and approval of the Procurement Management Director.

26.3. Contract:

- 26.3.1. The Awarded Bidder will be required to enter into the Contract with the County and will be required to perform the Work in accordance with the Contract terms and conditions. The draft Contract is

attached to this Solicitation and incorporated herein by reference. The Contract may be viewed online at <http://www.leegov.com/procurement/forms>.

26.4. Records:

- 26.4.1. Retention:** The Bidder shall maintain such financial records and other records as may be prescribed by Lee County or by applicable federal and state laws, rules and regulations. Unless otherwise stated in the Specifications, the Bidder shall retain these records for a period of ten (10) years after final payment, or until they are audited by Lee County, whichever event occurs first.
- 26.4.2. Right to Audit/Disclosure:** These records shall be made available during the term of the Contract as well as the retention period. These records shall be made readily available to County personnel with reasonable notice and other persons in accordance with the Florida General Records Schedule. Awarded Bidder(s) are hereby informed of their requirement to comply with Chapter 119, F.S., specifically to:
- 26.4.2.1. Keep and maintain public records required by the County to perform the service.
 - 26.4.2.2. Upon request from the County's custodian of public records, provide the County with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided or as otherwise provided by law.
 - 26.4.2.3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the Contract term and following completion of the Contract if the contractor does not transfer the records to the County.
 - 26.4.2.4. Upon completion of the Contract, transfer, at no cost, to the County all public records in possession of the Bidder or keep and maintain public records required by the County to perform the service. If the Bidder transfers all public records to the County upon completion of the Contract, the Bidder shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Bidder keeps and maintains public records upon completion of the Contract, the Bidder shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the County, upon request from the County's custodian of public records, in a format that is compatible with the information technology systems of the County.
- 26.4.3. Public Records: IF THE BIDDER HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE BIDDER'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THE CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 239-533-2221, 2115 SECOND STREET, FORT MYERS, FL 33901, publicrecords@leegov.com or <http://www.leegov.com/publicrecords>.**
- 26.4.4. Ownership:** It is understood and agreed that all documents, including detailed reports, plans, original tracings, specifications and all data prepared or obtained by the successful Bidder in connection with its services hereunder, including any documents bearing the professional seal of the successful Bidder, shall be delivered to and become the property of Lee County, prior to final payment to the successful Bidder or the termination of the Contract. This includes any electronic versions, such as CAD or other computer aided drafting programs.
- #### 26.5. Termination:
- 26.5.1.** Termination of an Award or Contract entered into pursuant to this Solicitation shall be governed by the terms of such Contract and by the provisions of this section.

- 26.5.2.** The Procurement Management Director may immediately terminate any Award resulting from this Solicitation for emergency purposes, as defined by the Lee County Procurement Ordinance 18-22.
- 26.5.3.** Any Bidder who has voluntarily withdrawn from a Solicitation without the County's mutual consent during the Contract period shall be barred from further County procurement for a **period of 180 calendar days**. The Bidder may apply to the Board for a waiver of this debarment. Such application for waiver of debarment must be coordinated with and processed by the Procurement Management Department.
- 26.5.4.** For a Contract over \$1,000,000, the County reserves the right to terminate an award of such contract upon information or belief of any of the following, when, applicable:
- 26.5.4.1. Bidder is found to have submitted a false certification as provided under § 287.135 (5), F.S.;
 - 26.5.4.2. Bidder has been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List (§ 215.473, F.S.);
 - 26.5.4.3. Bidder has engaged in business operations in Cuba or Syria (§ 215.471, F.S.);
 - 26.5.4.4. Bidder has been placed on the Scrutinized Companies that Boycott Israel List, or is engaged in a boycott of Israel (§ 215.4725, F.S.).
 - 26.5.4.5. The County reserves the right to review, on a case-by-case basis, and waive this stipulation if it is deemed to be advantageous to the County.

26.6 Termination for Convenience:

- 26.6.1.** The County may terminate the entire Contract or any portion thereof, if the Director determines that a termination is in the County's interest. The Director will deliver to the Contractor a Written Notice of Termination specifying the extent of termination and the effective date.
- 26.6.1.1. When the County terminates the entire Contract, or any portion thereof, before the Contractor completes all items of work in the Contract, the County will make payment for the actual number of units or items of work that the Contractor has completed, at the Contract unit price, and according to the formulas and provisions set forth in the contract documents for work partially completed, and such payments will constitute full and complete compensation for such work or items. No payment of any kind or amount will be made for items of work not started. The County will not consider any claim for loss of anticipated profits, or overhead of any kind (including home office and jobsite overhead or other indirect impacts) except as provided for within the contract documents for partially completed work.
 - 26.6.1.2. The County will consider reimbursing the Contractor for actual cost of mobilization (when not otherwise included in the Contract) including moving equipment to the job where the volume of the work that the Contractor has completed is too small to compensate the Contractor for these expenses under the Contract unit prices.
 - 26.6.1.3. The County may purchase at actual cost acceptable materials and supplies procured for the work, that the County has inspected, tested, and approved and that the Contractor has not incorporated in the work. Submit the proof of actual cost, as shown by receipted bills and actual cost records, at such points of delivery as the Director may designate.
 - 26.6.1.4. Termination of a contract or a portion thereof, does not relieve the Contractor or the surety of its responsibilities for the completed portion of the contract or its obligations for and concerning any just claims arising out of the work performed.
 - 26.6.1.5. All Contractor claims for additional payment, due to the County's termination of the entire Contract or any portion thereof, must meet the requirements as stated within the contract documents.

27. WAIVER OF CLAIMS

- 27.1. Once the Contract associated with this Solicitation expires, or final payment has been requested and made, the Awarded Bidder shall have waived any claims against the County concerning such Contract, except those previously made in writing and identified by the Awarded Bidder as unsettled at the time of the final application for payment.
28. LEE COUNTY PAYMENT PROCEDURES
- 28.1. Unless otherwise noted, all Awarded Bidders are requested to mail an original invoice to:
Lee County Finance Department
Post Office Box 2238
Fort Myers, FL 33902-2238
- 28.2. All invoices shall be paid as directed by the Lee County payment procedure, unless otherwise stated in the Contract or detailed Specifications for this project.
- 28.3. Lee County shall not be liable for requests for payment deriving from aid, assistance, or help by any individual, vendor, proposer, or Bidder for the preparation of these Specifications.
29. SAFETY DATA SHEETS (SDS) (as applicable)
- 29.1. It is the Bidder's responsibility to provide Lee County with Safety Data Sheets on Bid materials, as may apply to this procurement.
30. BOND/SURETY
- 30.1. Bonding/Surety is required in accordance with the Lee County Procurement Ordinance 18-22.
- 30.2. **Bid Bond/Security: The Procurement Management Department shall determine if a Bid Bond shall be required for any Competitive Procurement.** Each Bidder shall submit **not less than five percent (5%) of the proposed dollar amount** (including applicable Alternates) as Bid Bond/Security. One **ORIGINAL** Bid Bond/Security shall be submitted to the County with each Bid submission. The Bid Bond/Security of the Bidder will be retained until the Bidder and the County have entered into the Contract, whereupon the Bid Bond/Security may be returned. The Bid Bond/Security of a Bidder whom the County believes to have a reasonable chance of receiving the Award may be retained by the County until the effective date of the Contract, whereupon any Bid Bonds/Securities furnished by a Bidder may be returned. The following types of Bid Security shall be accepted:
- 30.2.1. **A Certified Check or a Cashier's Check** in the amount of not less than five percent (5%) of the proposed dollar amount. Any Certified Check or Cashier's Check submitted in lieu of a Bid Bond shall be drawn on a solvent bank or trust company, made payable to Lee County Board of County Commissioners and shall have all necessary documentary revenue stamps attached (if required by law); or
- 30.2.2. **A Bid Bond** may be submitted on a Lee County paper Bid Bond Form. Such Bid Bond must be signed by all required parties, must be in the amount of not less than five percent (5%) of the proposed dollar amount (including Alternate(s) as applicable), and shall accompany each submission. The Bid Bond shall be issued by a surety authorized to do business and in good standing with the Florida Department of State.
- 30.3. **Performance and Payment Bond:** As further described in the Contract, the successful Bidder shall provide Performance and Payment Bonds in the amount of one hundred percent (100%) of the total Awarded Contract amount within **seven (7) calendar days** after notification by the County of the approval to award the Contract, the costs of which are to be paid by the successful Bidder. Such Performance and Payment Bonds shall be in the form prescribed by the Exhibits to the attached Contract. The Performance and Payment Bonds shall be underwritten by a surety authorized to do business in the State of Florida and otherwise acceptable to the County; provided, however, the surety shall be rated as "B" or better as reported in the most current Best's Key Rating Guide, published by A.M. Best Company, Inc. The successful Bidder shall record the Performance and Payment Bond with the Lee County Clerk of Courts, at its sole expense, and provide the original, recorded bond document to the County.
- 30.4. **A Clean Irrevocable Letter of Credit or Cash Bond** may be accepted by the County in lieu of the Public Payment and Performance Bond.
- 30.5. **Personal Checks are not acceptable to Lee County as a Bid Security.**

31. INSURANCE (AS APPLICABLE)

- 31.1.** Insurance shall be provided by the Awarded Bidder pursuant to the Specifications provided herein and/or in the Contract. Prior to execution of the Contract, a certificate of insurance (COI) complying with the Solicitation Documents shall be provided by the Bidder.

End of Terms and Conditions Section

INSURANCE GUIDE



**Lee County Insurance Requirements
including Maritime Remedies**

Minimum Insurance Requirements: *Risk Management in no way represents that the insurance required is sufficient or adequate to protect the vendors' interest or liabilities. The following are the required minimums the vendor must maintain throughout the duration of this contract. The County reserves the right to request additional documentation regarding insurance provided*

- a. **Commercial General Liability** - Coverage shall apply to premises and/or operations, products and completed operations, independent contractors, contractual liability exposures with minimum limits of:

- \$1,000,000 per occurrence
- \$2,000,000 general aggregate
- \$1,000,000 products and completed operations
- \$1,000,000 personal and advertising injury

- b. **Business Auto Liability** - The following Automobile Liability will be required and coverage shall apply to all owned, hired and non-owned vehicles use with minimum limits of:

- \$1,000,000 combined single limit (CSL)
- \$500,000 bodily injury per person
- \$1,000,000 bodily injury per accident
- \$500,000 property damage per accident

- c. **Workers' Compensation** - Statutory benefits as defined by FS 440 encompassing all operations contemplated by this contract or agreement to apply to all owners, officers, and employees regardless of the number of employees. Workers Compensation exemptions ~~may be accepted~~ with written proof of the State of Florida's approval of such exemption. Employers' liability will have minimum limits of:

- \$500,000 per accident
- \$500,000 disease limit
- \$500,000 disease – policy limit

- d. **Maritime Remedies** – coverage shall provide minimum limits of liability of \$1,000,000 per occurrence for General Maritime Laws, including but not limited to:

- Maintenance & Cure;
- ~~Unseaworthiness;~~
- Wrongful Death;
- Jones Act;

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d. Maritime Remedies cont.

Death on the High Seas Act;
Longshore and Harbor Workers' Act;
Protection and Indemnity;

And or any other state workers' compensation law, or other federal occupational disease law that your employees might be exposed to.

**The required minimum limit of liability shown in a and b may be provided in the form of "Excess Insurance" or "Commercial Umbrella Policies." In which case, a "Following Form Endorsement" will be required on the "Excess Insurance Policy" or "Commercial Umbrella Policy."*

Verification of Coverage:

1. Coverage shall be in place prior to the commencement of any work and throughout the duration of the contract. A certificate of insurance will be provided to the Risk Manager for review and approval. The certificate shall provide for the following:

a. The certificate holder shall read as follows:

**Lee County Board of County Commissioners
P.O. Box 398
Fort Myers, Florida 33902**

b. "Lee County, a political subdivision and Charter County of the State of Florida, its agents, employees, and public officials" will be named as an "Additional Insured" on the General Liability policy, including Products and Completed Operations coverage.

Special Requirements:

1. An appropriate "Indemnification" clause shall be made a provision of the contract.
2. It is the responsibility of the general contractor to insure that all subcontractors comply with all insurance requirements.

SPECIAL CONDITIONS

These are conditions that are in relation to this Solicitation only and have not been included in the County's standard Terms and Conditions or the Scope of Work and Specifications.

1. TERM

1.1. The Contractor shall be responsible for furnishing and delivering to the Lee County requesting Department(s) the commodity or services on an "as needed basis" for a one-year (1) period. Contractors must hold a firm fixed price for the initial term of the contract. There may be an option to extend this contract as specified in the Scope of Work or specifications upon the approval of both the County and the Contractor at the time of extension or renewal for three (3), additional one (1) year periods.

2. WORK AUTHORIZATION

2.1. This is a "Master" contract, which is not for any specific project. Under this Contract work shall be authorized, scheduled, funded and accounted for through the issuance of County Project Authorizations (CPA) as described within Exhibit A – Scope of Services.

2.1.1. Following project specific needs, additional services may be required to provide for full project completion. Such services shall be requested under this Contract on a project-by-project basis where Contractor or County deem necessary and applicable.

3. BASIS OF AWARD

3.1. Contractor(s) are not required to bid all line items; however, Contractor(s) are asked to bid all lines applicable to their company/for services they can provide under this contract.

3.2. Contractor(s) who no bid an item **cannot** provide that item at any time throughout the term of the contract.

3.3. It is the intent of the County to award to a pool of responsive and responsible Contractors that are capable of meeting all the bid specifications as provided herein.

4. LETTER OF BONDABILITY

4.1. This bid does not require a Bid Bond, however the Contractor must submit with their bid a Letter of Bondability from their Surety Company (not the surety agent) showing their bonding capacity. Any issuer of a Letter of Bondability must be licensed to transact a fidelity and surety business in the State of Florida, with an A.M. Best rating of B (Very Good).

4.2. If the surety agent is named on the Surety's Power of Attorney as a true and lawful Attorney-in-Fact, to make, execute, seal and deliver said letter then a letter from the surety's agent will be allowed as long as a copy of the Surety's Power of Attorney documenting said appointment is included with the Letter of Bondability.

End of Special Conditions Section

SCOPE OF WORK AND SPECIFICATIONS

1. GENERAL SCOPE OF WORK

- 1.1. Lee County desires to contract with a pool of Contractors to perform structural, functional and aesthetic repairs on different County bridges and box culvert on an as needed basis. Work may consist of, but is not limited to: repair or replacement of different structures, sidewalks, handrails, crack repairs, navigation lights replacement, milling and paving, sea wall repair and I or concrete deck grinding. Additional services may include: excavation, embankment, clearing & grubbing, fill, grading, asphalt patching or replacement, deck resurfacing, sinkhole repair or stabilization, erosion control, painting, grass installation and other miscellaneous tasks associated with such work. All work performed to follow Federal, State, Local, Occupational Safety and Health Administration (OSHA) and department mandated regulations and specifications for associated work.
- 1.2. The scope is further defined and detailed within Exhibits E-N found attached to the draft contract agreement affixed to this solicitation package as well as within the plans associated with this project. Contractor is responsible for reviewing all documentation associated with this project.

End of Scope of Work and Specifications Section

Supplemental Information

None

End of Supplemental Information Section

LEE COUNTY DOCUMENT MANAGEMENT FORM

For

B190142TJM Bridge Maintenance and Repairs-Annual

These forms are required as indicated below and all required forms should be submitted with the Bidder’s/Proposer’s submission package. If it is determined that forms in this selection are not applicable to your company or solicitation they should be marked “N/A or Not Applicable” across the form in large letters and returned with your submission package.

FORM #	TITLE / DESCRIPTION	REQUIRED STATUS (Required, Not Required, If Applicable)	VENDOR CHECK-OFF
1	Solicitation Response Form	Required	
1a	Bid/Proposal Form	Required	
N/A	Business Relationship Disclosure Requirement	If Applicable	
2	Affidavit Certification Immigration Laws	Required	
3	Reference Survey <i>*(Requested after opening of lowest Bidder only)</i>	Required	
4	Negligence or Breach of Contract Disclosure Form	Required	
5	Affidavit - Principal Place of Business	Required	
6	Sub-Contractor List	Required	
7	Public Entity Crime Form	Required	
8	Trench Safety	Required	
	Letter of Bondability	Required	
*	Proposal Label	Required	
ADDITIONAL REQUIRED DOCUMENTS			
NONE			

It is the Bidder’s/Proposer’s responsibility to review the submittal request in its entirety and ensure that all submittal requirements are included within their submission package. Failure to submit required forms may deem your company as non-responsive.

FORMS DESCRIPTION & INSTRUCTIONS

INVITATION TO BID

This table provides a brief list, description, and instructions regarding the standard requested forms that should be submitted with all bids or proposals. This is not intended to be an all-inclusive list of forms required for your submission, but rather a guide to assist in completion of the County's standard forms. Bidders/Proposers should utilize the Lee County Document Management Form for a complete list of all forms required for project submission.

<u>Form #</u>	<u>Title/Description</u>
1	<p><i>Solicitation Response Form</i></p> <p>All signatures must be by a corporate authorized representative, witnessed, and corporate and/or notary seal (as applicable.) The corporate or mailing address must match the company information as it is listed with the Florida Department of State Division of Corporations. Attach a copy of the web-page(s) from http://www.sunbiz.org as certification of this required information. Sample attached for your reference.</p> <p>Verify that all Addenda and tax identification number have been provided.</p>
1a	<p><i>Bid/Proposal Form</i></p> <p>This form is used to provide itemization of project cost. A more detailed "schedule of values" may be requested by the County.</p>
N/A	<p><i>Business Relationship Disclosure Requirement</i></p> <p>Sections 112.313(3) and 112.313(7), F.S., prohibit certain business relationships on the part of public officers and employees, their spouses, and their children. If this <u>disclosure is applicable, the Bidder must request the form entitled "INTEREST IN COMPETITIVE BID FOR PUBLIC BUSINESS"</u> (Required by § 112.313(12)(b), F.S.) to be completed and <u>returned with the Solicitation Response</u>. It is the Bidder's responsibility to request the form and disclose this relationship; failure to do so may result in being declared non-responsive.</p> <p>NOTICE: UNDER THE PROVISIONS OF § 112.317, F.S., A FAILURE TO MAKE ANY REQUIRED DISCLOSURE CONSTITUTES GROUNDS FOR, AND MAY BE PUNISHED BY, ONE OR MORE OF THE FOLLOWING: IMPEACHMENT, REMOVAL OR SUSPENSION FROM OFFICE OR EMPLOYMENT, DEMOTION, REDUCTION IN SALARY, REPRIMAND, OR A CIVIL PENALTY NOT TO EXCEED \$10,000.00.</p>
2	<p><i>Affidavit Certification Immigration Laws</i></p> <p>Submission of this form constitutes acknowledgement that the Bidder is in compliance in regard to all applicable immigration laws.</p>
3	<p><i>Reference Survey</i></p> <p>Provide this form to reference respondents. <u>For Bids, this form will be requested from the apparent low Bidder prior to the award. (not required to submit with bid)</u></p> <ol style="list-style-type: none"> 1. Section 1: Bidder/Proposer to complete with <u>reference respondent's</u> information prior to providing to them for their response. (This is not the Bidder/Proposer's information.) 2. Section 2: Enter the name of the Bidder/Proposer; provide the project information in which the reference respondent is to provide a response. 3. The <u>reference respondent</u> should complete "Section 3." 4. Section 4: The reference respondent to print and sign name 5. Three (3) Reference responses are to be provided upon request. 6. Failure to obtain reference surveys may make your company non-responsive.

4 *Negligence or Breach of Contract Disclosure Form*

The form may be used to disclose negligence or breach of contract litigation that your company may have been a part of over the past ten (10) years. You may need to duplicate this form to list all history. If the Bidder has more than ten (10) lawsuits, you may narrow them to litigation of the company or subsidiary submitting the Solicitation Response. Include, at a minimum, litigation for similar projects completed in the State of Florida. Final outcome should include in whose favor the litigation was settled and whether a monetary amount was awarded. The settlement amount may remain anonymous.

If you have **no litigation**, enter **“None”** in the first **“type of incident”** block of the form. Please do not write N/A on this form.

5 *Affidavit - Principal Place of Business*

Certifies Bidder’s location information.

6 *Sub-Contractor List*

To be completed and returned when sub-contractors are to be utilized and are known at the time of the submission.

7 *Public Entity Crime Form*

Any person or affiliate, as defined by statute, who has been placed on the convicted vendor list following a conviction for a public entity crime, may not submit a Bid on a Contract to provide any goods or services to the County; may not submit a Bid on a contract with the County for the construction or repair of a public building or a public work; may not submit Bids or leases of real property to the County; may not be Awarded or perform Work as a contractor, supplier, subcontractor, or consultant under a contract with the County, and may not transact business with the County in excess of \$25,000.00 for a period of thirty-six (36) months from the date of being placed on the convicted vendor list.

8 *Trench Safety*

Typically required in construction projects where trench excavations are in excess of 5 feet deep per Florida Trench Safety Act (90-96, Laws of Florida)

Letter of Bondability

Self-Explanatory

***** *Bid/Proposal Label*

Self-explanatory. Please affix to the outside of the sealed submission documents.

***** *Include any licenses or certifications requested*

Local Business Tax Account (as applicable) issued by City and/or County entity. This is necessary for all Florida vendors.

It is the Bidder’s responsibility to ensure the Solicitation Response is mailed or delivered in time to be received no later than the specified opening date and time. (If Solicitation is not received prior to the deadline, it cannot be considered or accepted)



LEE COUNTY PROCUREMENT MANAGEMENT
SOLICITATION RESPONSE FORM

Date Submitted: _____ Deadline Date: 4/16/2019

SOLICITATION IDENTIFICATION: CN190142TJM

SOLICITATION NAME: Bridge Maintenance and Repairs-Annual

COMPANY NAME: _____

NAME & TITLE: (TYPED OR PRINTED) _____

BUSINESS ADDRESS: (PHYSICAL) _____

CORPORATE OR MAILING ADDRESS: _____

[] SAME AS PHYSICAL

ADDRESS MUST MATCH SUNBIZ.ORG

E-MAIL ADDRESS: _____

PHONE NUMBER: _____ FAX _____

NOTE REQUIREMENT: IT IS THE SOLE RESPONSIBILITY OF THE BIDDER/PROPOSER TO CHECK THE LEE COUNTY PROCUREMENT MANAGEMENT WEB SITE FOR ANY ADDENDA ISSUED FOR THIS PROJECT. THE COUNTY WILL POST ADDENDA TO THIS WEB PAGE, BUT WILL NOT NOTIFY.

By responding to this sealed Solicitation, the Bidder/Proposer makes all representations required by the instructions and further warrants and represents that: Bidder/Proposer has examined copies of all the Solicitation Documents and of the following Addenda:

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

Tax Payer Identification Number: _____

(1) Employer Identification Number -OR- (2) Social Security Number:

** Lee County collects your social security number for tax reporting purposes only

Please submit a copy of your registration from the website www.sunbiz.org establishing your firm as authorized (including authorized representatives) to conduct business in the State of Florida, as provided by the Florida Department of State, Division of Corporations. (a sample is attached for your reference)

1 Collusion Statement: Lee County, Florida. The undersigned, as Bidder/Proposer, hereby declares that no person or other persons, other than the undersigned, are interested in this Solicitation as principal, and that this Solicitation is submitted without collusion with others; and that they have carefully read and examined the Specifications or Scope of Work, and with full knowledge of all conditions under which the services herein is contemplated must be furnished, hereby Bid and agree to furnish this service according to the requirements set out in the Solicitation Documents, Specifications or Scope of Work for said service for the prices as listed on the County provided price sheet or (CCNA) agree to negotiate prices in good faith if a contract is Awarded.

2 Scrutinized Companies Certification: Section 287.135, F.S, entitled "Prohibition against contracting with scrutinized companies" prohibits agencies from contracting with companies, for goods or services over \$1,000,000, that are on the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, Scrutinized Companies that Boycott Israel List, have been engaged in a boycott of Israel, or been engaged in business operations in Cuba or Syria. The County reserves the right to review, on a case-by-case basis, and waive this stipulation if it is deemed advantageous to the County.

As the person authorized to sign on behalf of Respondent, I hereby certify that the company identified above is in compliance with Section 287.135, F.S. I understand that submission of a false certification may subject company to contract termination, civil penalties, attorney's fees, and/or costs.

Form#1 – Solicitation Form, Page 2

3 Business Relationship Disclosure Requirement: Sections 112.313(3) and 112.313(7), F.S., prohibit certain business relationships on the part of public officers and employees, their spouses, and their children. See Part III, Chapter 112, F.S., and/or the brochure entitled "A Guide to the Sunshine Amendment and Code of Ethics for Public Officers, Candidates and Employees" for more details on these prohibitions. However, Section 112.313(12), F.S., provides certain limited exemptions to the above-referenced prohibitions, including one where the business is awarded under a system of sealed, competitive bidding; the public official has exerted no influence on bid negotiations or specifications; and where disclosure is made, prior to or at the time of the submission of the bid, of the official's or his/her spouse's or child's interest and the nature of the intended business. The Commission on Ethics has promulgated this form for such disclosure, if and when applicable to a public officer or employee.

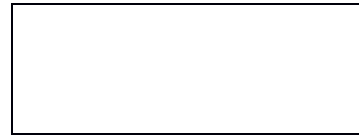
If this disclosure is applicable, the Bidder must request form "INTEREST IN COMPETITIVE BID FOR PUBLIC BUSINESS" (Required by 112.313(12)(b), F.S.) to be completed and returned with Solicitation Response. It is the Bidder/proposer's responsibility to disclose this relationship, failure to do so could result in being declared non-responsive.

Business Relationship Applicable (request form) *Business Relationship NOT Applicable*

4 Disadvantaged Business Enterprise (DBE) Bidder/proposer? If yes, please attach a current certificate. Yes No

ALL SUBMISSIONS MUST BE EXECUTED BY AN AUTHORIZED AUTHORITY OF THE BIDDER/PROPOSER. WITNESSED AND SEALED (AS APPLICABLE)

Company Name *(Name printed or typed)*



(Affix Corporate Seal, as applicable)

Authorized Representative Name *(printed or typed)*

Authorized Representative's Title *(printed or typed)*

Witnessed/Attested by: *(Witness/Secretary name and title printed or typed)*

Authorized Representative's Signature

Witness/Secretary Signature

Any blank spaces on the form(s), qualifying notes or exceptions, counter offers, lack of required submittals, or signatures, on County's form may result in the submission being declared non-responsive by the County.

Detail by Entity Name

Florida Profit Corporation

Bill's Widget Corporation

Filing Information

Document Number 655555
FEI/EIN Number 5111111111
Date Filed 09/22/1980
State FL
Status ACTIVE
Last Event AMENDED AND RESTATED ARTICLES
Event Date Filed 07/25/2006
Event Effective Date NONE

Principal Address

555 N Main Street
Your Town, USA 99999
Changed 02/11/2012

Mailing Address

555 N Main Street
MYour Town, USA 99999
Changed 02/11/2012

Registered Agent Name & Address

My Registered Agent
111 Registration Road
Registration, USA99999
Name Changed: 12/14/2006
Address Changed: 12/14/2006

Officer/Director Detail

Name & Address

Title P
President, First
555 AVENUE
Anytown, USA99999

Title V
President, Second
555 AVENUE
Anytown, USA99999

Sample Only



Lee County Procurement Management

BID FORM

Company Name: _____

Solicitation #	Solicitation Name
<u>B190142TJM</u>	<u>Bridge Maintenance and Repairs-Annual</u>

This page serves as a header/placeholder only. Please refer to the Excel document provided with the solicitation for the complete Bid Schedule. The Excel document contains formulas for convenience, however it is the Contractor’s responsibility to verify all pricing and calculations are CORRECT. Lee County is not responsible for errors in formulas or calculations contained within Excel document(s).

REMINDER: In the event there is a discrepancy between the total quoted amount or the extended amounts and the unit prices quoted, the unit prices will prevail and the corrected sum will be considered the quoted price.

The County will only accept bids submitted on bid forms provided by the County. Bids submitted on other forms, other than those provided by the County, will deem Bidder as non-responsive and ineligible for award.

Bidders may not adjust or modify data provided within the Bid Schedule. Bids received with modified data may deem the Bidder as non-responsive and ineligible for award.

PLEASE ENSURE you have provided a printed copy of the Bid Schedule with your hard copy submission packages and provided the excel version with your digital submission package.

PRICING

Pricing shall be inclusive of all labor, equipment, supplies, overhead, profit, materials, and any other incidental costs required to perform and complete all work as specified herein.

Form 2 – Affidavit Certification of Immigration Laws



AFFIDAVIT CERTIFICATION IMMIGRATION LAWS

SOLICITATION NO.: **B190142TJM** SOLICITATION NAME: **Bridge Maintenance and Repairs-Annual**

LEE COUNTY WILL NOT INTENTIONALLY AWARD COUNTY CONTRACTS TO ANY CONTRACTOR WHO KNOWINGLY EMPLOYS UNAUTHORIZED ALIEN WORKERS, CONSTITUTING A VIOLATION OF THE EMPLOYMENT PROVISIONS CONTAINED IN 8 U.S.C. SECTION 1324 a(e) {SECTION 274A(e) OF THE IMMIGRATION AND NATIONALITY ACT (“INA”).

LEE COUNTY MAY CONSIDER THE EMPLOYMENT BY ANY CONTRACTOR OF UNAUTHORIZED ALIENS A VIOLATION OF SECTION 274A(e) OF THE INA. **SUCH VIOLATION BY THE RECIPIENT OF THE EMPLOYMENT PROVISIONS CONTAINED IN SECTION 274A(e) OF THE INA SHALL BE GROUNDS FOR UNILATERAL CANCELLATION OF THE CONTRACT BY LEE COUNTY.**

BIDDER/PROPOSER ATTESTS THAT THEY ARE FULLY COMPLIANT WITH ALL APPLICABLE IMMIGRATION LAWS (SPECIFICALLY TO THE 1986 IMMIGRATION ACT AND SUBSEQUENT AMENDMENTS).

Company Name: _____

Signature Title Date

STATE OF _____
COUNTY OF _____

The foregoing instrument was signed and acknowledged before me this _____ day of _____
20____, by _____ who has produced

(Print or Type Name)

_____ as identification.
(Type of Identification and Number)

Notary Public Signature

Printed Name of Notary Public

Notary Commission Number/Expiration

The signee of this Affidavit guarantees, as evidenced by the sworn affidavit required herein, the truth and accuracy of this affidavit to interrogatories hereinafter made. **LEE COUNTY RESERVES THE RIGHT TO REQUEST SUPPORTING DOCUMENTATION, AS EVIDENCE OF SERVICES PROVIDED, AT ANY TIME.**



**ALLEGED NEGLIGENCE OR BREACH OF CONTRACT
DISCLOSURE FORM**

Please fill in the form below. Provide each incident in regard to alleged negligence or breach of contract that has occurred over the past 10 years. Please complete in chronological order with the most recent incident on starting on page 1.

Company Name: _____

Type of Incident <i>Alleged Negligence or Breach of Contract</i>	Incident Date And Date Filed	Plaintiff <i>(Who took action against your company)</i>	Case Number	Court <i>County/State</i>	Project	Claim Reason <i>(initial circumstances)</i>	Final Outcome <i>(who prevailed)</i>

Make as many copies of this sheet as necessary in order to **provide a ten (10) year history** of the requested information. If there is no action pending or action taken in the last ten (10) years, complete the **company name and write "NONE" in the first "Type of Incident" box** of this page and return with your submission package. This form should also include the primary partners listed in your submission. Do not include litigation with your company as the plaintiff. Final outcome should include who prevailed and what method of settlement was made. If a monetary settlement was made, the amount may remain anonymous. **Please do not modify this form (expansion of spacing allowed) or submit your own variation.**

Page Number: _____ Of _____ Total pages

Update the page number to reflect the current page and the total number of pages. Example: Page 3, of 5 total submitted pages of this form.



LEE COUNTY
SOUTHWEST FLORIDA

AFFIDAVIT PRINCIPAL PLACE OF BUSINESS

Instructions: Please complete all information that is applicable to your firm.

Company Name: _____

Printed name of authorized signer

Title

⇒ _____
Authorized Signature

Date

The signee of this affidavit guarantees, as evidenced by the sworn affidavit required herein, the truth and accuracy of this affidavit to interrogatories hereinafter made. **LEE COUNTY RESERVES THE RIGHT TO REQUEST SUPPORTING DOCUMENTATION, AS EVIDENCE OF SERVICES PROVIDED, AT ANY TIME.**

Notary:

State of _____

County of _____

The foregoing instrument was signed and acknowledged before me this _____ day of _____

20 _____ by _____ who has produced

_____ as identification (or personally known)
Type of ID and number

⇒ _____
Notary Public Signature

Notary Commission Number and expiration

1. Principal place of business is located within the boundaries of: _____ Lee County
_____ Collier County
_____ Non-Local

Local Business Tax License # _____

2. Address of Principal Place of Business: _____

3. Number of years at this location _____ years

4. Have you provided goods or services to Lee County on a regular basis within the past 3 consecutive years
_____ Yes* _____ No *If yes, attach contractual history for past 3 consecutive years

5. Number of available employees for this Contract _____

6. Does your company have a Drug Free Workplace Policy _____ Yes _____ No

Public Entity Crime Form

This form must be signed and sworn to in the presence of a notary public or other officer authorized to administer oaths.

1. This sworn statement is submitted to _____
(Print name of the public entity)

by _____
(Print individual's name and title)

for _____
(Print name of entity submitting sworn statement)

whose business address is _____

(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: On the attached sheet.) Required as per IRS Form W-9.

2. I understand that a “public entity crime” as defined in Section 287.133(1) (g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including but not limited to, a bid or contract for goods or services to be provided to any public entity or agency or political subdivision or any other state or of the United States, and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

3. I understand that “convicted” or “conviction” as defined in Section 287.133(1) (b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

4. I understand that “affiliate” as defined in Section 287.133(1)(a), Florida Statutes, means:
1. A predecessor or successor of a person convicted of a public entity crime:
or:
2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term “affiliate” includes those offices, directors, executives, partners, shareholders, employees, members and agents who are active in the management of the affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not fair market value under an arm’s length Agreement/Contract, shall be a facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding thirty-six (36) months shall be considered an affiliate.

5. I understand that a “person” as defined in Section 287.133(1) (c), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term “person” includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of the entity.

Public Entity Crime Form

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting those sworn statement. *(Please indicate which statement applies)*

_____ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity nor affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

Page 2 of 2

_____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, member, or agents who are active in management of the entity, or an affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, member, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearing and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (Attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH ONE ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES, FOR CATEGORY TWO OR ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

(Signature)

(Date)

STATE OF _____

COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, _____
(Name of individual signing)

who, after first being sworn by me, affixed his/her signature in the space provided above on this _____ day

of _____, 2____.

(NOTARY PUBLIC)

My Commission Expires: _____

Form#8: Trench Safety

TRENCH SAFETY

Contractor/vendor acknowledges that included in the appropriate Solicitation items of the Solicitation and in the total Solicitation price are costs for complying with the Florida Trench Safety Act (90-96, Laws of Florida) effective October 1, 1990. The contractor/vendor further identifies the costs of such compliance to be summarized below:

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

If applicable, the contractor/vendor certifies that all trench excavation done within its control in excess of five feet (5') in depth shall be in accordance with the Florida Department of Transportation's Special Provisions Article 125-1 and Sub-article 125-4.1 (TRENCH EXCAVATION SAFETY SYSTEM AND SHORING, SPECIAL-TRENCH EXCAVATION).

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

(Signature)

(Company Name)

STATE OF _____
 COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ day of _____ by _____
(name and title of corporate officer) of _____ *(name of corporation)*, a _____ *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(type of identification)* as identification.

(signature line for notary public)

(name of notary typed, printed or stamped)

(title or rank)

(serial number, if any)

My commission expires:

BID BOND

Complete EITHER Lee County Paper Bid Bond OR provide cashier's check

KNOW ALL MEN BY THESE PRESENTS, that we

_____ as Principal, and
(BIDDER'S Name)

_____ a corporation licensed to do
(Surety's Name)

business under the laws of the State of Florida as a Surety, are held and firmly bound unto LEE COUNTY BOARD OF COUNTY COMMISSIONERS, LEE COUNTY, FLORIDA, a political subdivision of the State of Florida,

in the SUM OF _____
for the payment whereof, well and truly to be made, we bind ourselves, our heirs, successors, personal representatives and assigns, jointly and severally, firmly, by these presents.

SIGNED AND SEALED this _____ day of _____, _____

WHEREAS, said Principal is herewith submitting a Bid/Proposal for the project know as:

B190142TJM Bridge Maintenance and Repairs-Annual

NOW, THEREFORE, the condition of the above obligation is such that if said Principal shall be Awarded the Contract upon said Bid/Proposal within the specified time and shall enter into a written Contract, satisfactory in form, provide an acceptable Public Performance and Payment Bond from a Surety acceptable to the County and provide other insurance as may be required to the County within seven (7) calendar days after the written Notice of Intent to Award date, or within such extended period as the County may grant, then this obligation shall be null and void; otherwise said Principal and Surety shall pay to said County in money the difference between the amount of the Bid of said Principal and the amount for which said County may legally contract with another party to perform said Work, if the latter amount be in excess of the former, together with any expenses and reasonable attorney's fees incurred by said County if suit be brought hereon, but in no event shall said Surety's liability exceed the penal sum hereof plus such expenses and attorney's fees. For purposes of unsuccessful bid protests filed by the Principal herein, this obligation shall bind the Surety to pay costs and damages associated with the bid protest or delays to the project upon a finding from the Board of County Commissioners for Lee County that the bid protest was frivolous and/or lacked merit. The liability of the Surety shall not exceed the penal sum of the bid bond.

Witness as to Principal: _____ (SEAL)
(Principal)

(By) Printed Name

Witness as to Surety: _____ (SEAL)
(Surety's Name)

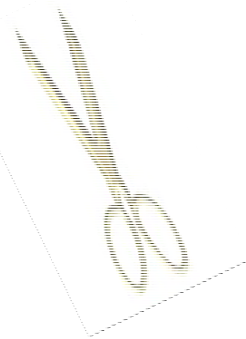
(By-As Attorney-in-Fact, Surety)

Affix Corporate Seals and attach proper Power of Attorney for Surety.

Sealed Bid Label

Cut along the outer border and affix this label to your sealed solicitation envelope to identify it as a "Sealed Bid".

SEALED BID DOCUMENTS • DO NOT OPEN	
BID NO.:	B190142TJM
BID TITLE:	Bridge Maintenance and Repairs-Annual
DATE DUE:	Tuesday, April 16, 2019
TIME DUE:	Prior to: 2:30 PM
SUBMITTED BY:	_____ (Name of Company)
e-mail address	Telephone
DELIVER TO:	Lee County Procurement Management 1500 Monroe 4 th Floor Fort Myers FL 33901
<i>Note: submissions received after the time and date above will not be accepted.</i>	



Lee County Procurement Management
1500 Monroe Street, 4th Floor
Fort Myers, FL 33901
(239) 533-8881
www.leegov.com/procurement

PLEASE PRINT CLEARLY

DRAFT CONSTRUCTION AGREEMENT

[ATTACH AGREEMENT]

MASTER CONSTRUCTION AGREEMENT

LEE COUNTY, a political subdivision of the State of Florida, by and through its Board of County Commissioners, situated at 2115 Second St., Fort Myers, FL 33901 (the "County"), hereby contracts with [Contractor's name **exactly** as it appears on Sunbiz] (the "Contractor") of [Contractor's primary business address] a [Contractor's state] contractor licensed to perform all Work in the State of Florida in connection with the County's Solicitation No. B190142TJM (the "Project"), as said Work is set forth in the Plans and Specifications prepared by [Engineer of Record's name], the "Engineer of Record," and other Contract Documents hereafter specified (the "Work").

The County and the Contractor, for the consideration herein set forth, agree as follows:

Section 1. Contract Documents.

A. The Contract Documents consist of this Agreement, the Exhibits described in Section 6 hereof, the legal advertisement, the instructions to bidders, the Proposal and Proposal Forms, the solicitation documents and any duly executed and issued addenda, the Contractor's proposal, County Project Authorizations, County Project Modifications, Field Directive Change Orders, and amendments relating thereto. All of the foregoing Contract Documents are incorporated by reference and made a part of this Agreement with the exception of the solicitation which shall be incorporated to the extent that it does not conflict with the remainder of the Agreement (all of said documents including the Agreement sometimes being referred to herein as the "Contract Documents" or "Contract" and sometimes as the "Agreement"). A copy of the Contract Documents shall be maintained by Contractor at the Project Site at all times during the performance of the Work.

B. The Engineer of Record is the initial interpreter of the Contract Documents concerning design intent, but is not the judge between the County and the Contractor. The County reserves the right to make final decisions considering the Engineer of Record's recommendations or interpretations of the Contract Documents. The Engineer of Record does not have authority to obligate or commit the County to fund additional expenditures or approve extensions of time over the approved Contract Time or Amount. However, the Engineer of Record's interpretation as to the intent of her or his design shall be final and not subject to interpretation by the County's staff.

C. The Construction Engineering and Inspection Consultant ("CEI Consultant") is the initial interpreter of the Contract Documents in all matters not concerning design intent. The CEI Consultant shall administer, monitor, test, sample, and inspect the Construction of the Project to ensure that the Project is constructed in reasonable conformity with the plans, specifications, and special provisions of the Contract Documents and shall observe the Contractor's work to determine the progress and quality of work, identify discrepancies, report significant discrepancies to the County, and direct the Contractor to correct such observed discrepancies. The County reserves the right to

make final decisions considering the CEI Consultant's recommendations or interpretations of the Contract Documents. The CEI Consultant may issue Field Directive Change Orders to the Contractor, but the CEI Consultant does not have authority to change the scope of the Project, obligate or commit the County to fund additional expenditures, or approve extensions of time over the approved Contract Time or Amount. The CEI Consultant shall consult with the Engineer of Record regarding any questions concerning the intent of the Project design.

D. Any Work that may be reasonably inferred from the Plans and Specifications as being required to produce the intended result shall be supplied whether or not it is specifically called for. In case of any inconsistency or conflict among the provisions of the Contract Documents, the order of precedence shall be as follows: (1) County Project Modifications; (2) County Project Authorizations; (3) the Agreement, including amendments and Exhibits; (4) Field Directive Change Orders; (5) the solicitation documents, including any addenda. Exhibit G, Article 5-2 provides the order of precedence for Specifications, Plans, Special Provisions, Technical Special Provisions, and other Project specifications. The Contract Documents represent the entire and integrated Agreement between the parties hereto, and supersede prior negotiations, representations, or agreements, either written or oral.

E. Work, materials or equipment described in words which have a well-known technical or trade meaning, shall be deemed to refer to such recognized standards.

F. The County shall furnish to the Contractor Contract Documents in electronic form and PDF file format.

G. The Contractor agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the County.

H. The Work to be provided by Contractor for the Project shall be under the general direction of the CEI Consultant, or their successor, who shall act as the County's representative during the term of this Agreement. If the County's representative is not a County employee, then County's representative is not authorized to issue changes to the Contract Amount, Contract Time, or Scope of Work without express approval by the County Director, County Manager, or Board of County Commissioners.

Section 2. Scope of Work.

A. The Contractor agrees to furnish and pay for all management, supervision, financing, labor, materials, tools, transportation, fuel, supplies, utilities, equipment and services of every kind and type necessary to diligently, timely, and fully perform and complete in a good and workmanlike manner the Work required by this Agreement.

B. The Work shall be prosecuted and administered in accordance with the Standard Specifications attached hereto and incorporated herein as Exhibit G and all County Project Authorizations.

C. A County Project Authorization shall be issued by the County before commencement of any Work related to this Agreement. Contractor acknowledges and agrees that no minimum order or amount of Work is guaranteed under this Contract and County may elect to issue no County Project Authorizations.

Section 3. Contract Amount.

A. In consideration of the faithful performance by the Contractor of the covenants in this Contract, and any County Project Authorizations issued hereunder, to the full satisfaction and acceptance of the County, the County agrees to pay, or cause to be paid, to Contractor the Contract Amount established in the County Project Authorization(s) awarding the Work as set forth in the Exhibits to this Agreement.

B. Measurement and payment provisions are provided in Division 1, Section 9 of the Standard Specifications attached hereto as Exhibit G.

Section 4. Bonds.

A. For each County Project Authorization authorizing Work for a cost of \$100,000.00 or more, the Contractor shall procure Performance and Payment Bonds, in the form prescribed in Exhibit F, in conformance with this Agreement and the Solicitation. Contractor shall provide Performance and Payment Bonds in the amount of 100% of the Contract Amount, the costs of which are to be paid by Contractor. If the Contract Amount is increased by a County Project Modification, it shall be the Contractor's responsibility to ensure that the Performance and Payment Bonds are amended accordingly and a copy of the amendment recorded by the Lee County Clerk of Court and forwarded to the County. The Performance and Payment Bonds shall be underwritten by a Surety authorized to do business in the State of Florida and otherwise acceptable to the County; provided, however, the Surety shall be rated as "B or better" as to general policy holders rating as reported in the most current Best Key Rating Guide, published by A.M. Best Company, Inc.

B. Attorneys-in-Fact who sign Bonds for County projects must file with such Bond a certified copy of their Power of Attorney to sign such Bond. All agents of Surety companies must list their name, address, and telephone number on all Bonds. The life of all Bonds provided to the County shall extend twelve (12) months beyond the date of final payment and shall contain a waiver of alternation to the terms of the Contract, extensions of time and/or forbearance on the part of the County. The Surety must have fulfilled all of its obligations on all other Bonds previously provided to the County. The Surety must have a minimum underwriting limitation of \$5,000,000 published in the latest edition of the Federal Register for Federal Bonds (U.S. Dept. of Treasury).

C. If the Surety for any Bond furnished by Contractor is declared bankrupt, becomes insolvent, its right to do business is terminated in the State of Florida, or it ceases to meet the requirements imposed by the Contract Documents, the Contractor

shall, within five (5) calendar days thereafter, substitute at Contractor's cost another Bond and Surety, both of which shall be subject to the County's approval.

D. If the Contractor cannot obtain another Bond and Surety within five (5) calendar days, the County may accept and the Contractor shall submit an irrevocable letter of credit drawn on a Lee County, Florida bank until the Bond and Surety can be obtained.

E. In case of default on the part of the Contractor, the County will charge against the Contract/Performance Bond all expenses for services incidental to ascertaining and collecting losses under the Contract/Performance Bond, including accounting, engineering, and legal services, together with any and all costs incurred in connection with renegotiation of the Contract.

F. The Surety shall indemnify and provide defense for the County when called upon to do so for all claims or suits against the County, by third parties, pertaining to Contractor payment or performance issues arising out of the Contract where the Contractor has failed to timely provide the County such defense. It is expressly understood that the monetary limitation on the extent of the indemnification shall be the approved Contract amount, which shall be the original Contract amount as may be modified by subsequent County Project Modifications.

G. The principal and Surety executing the Contract/Performance Bond shall be liable to the County in any civil action that might be instituted by the County or any officer of the County authorized in such cases, for triple any amount in money or property the County might lose, or be overcharged, or otherwise be defrauded of by any wrongful or criminal act of the Contractor, their agent or their employees.

Section 5. Contract Time and Liquidated Damages

A. Time is of the essence in the performance of the Work under this Agreement. The Commencement Date is established in the Notice to Proceed to be issued by the County, and the Contractor must begin the Work within the number of days specified by the Notice to Proceed. Written Notice to Proceed is contingent upon and will be done subsequent to the Contractor fully satisfying the County's stated insurance and Bond submittal requirements. No Work shall be performed at the Project Site prior to the Commencement Date. Any Work performed by the Contractor prior to the Commencement Date shall be at the sole risk of the Contractor. The County Project Authorization authorizing the Work shall establish the number of calendar days after the Commencement Date within which the Contractor must achieve Final Acceptance of the Work. That time period shall be the Contract Time. The date of Final Acceptance of the Work (or designated portions thereof) is the date certified by the Director pursuant to Exhibit G, Article 5-11.

B. Prosecution and progress of the Work provisions are provided in Division 1, Section 8 of the Standard Specifications attached hereto as Exhibit G.

C. The County and the Contractor recognize that, since time is of the essence for this Agreement, the County will suffer financial loss if Final Acceptance of the Work is not achieved within the time specified above, as said time may be adjusted as provided for herein. Should the Contractor fail to achieve Final Acceptance of the Work within the time period noted above, the County shall be entitled to assess the amount set forth in Article 8-10 of the Standard Specifications, as Liquidated Damages, but not as a penalty, for each calendar day thereafter until Final Acceptance is achieved. Final Acceptance of the Work shall be deemed to occur on the date the Director issues a written notice of Final Acceptance pursuant to the terms hereof. The Contractor hereby expressly waives and relinquishes any right which it may have to seek to characterize the above noted Liquidated Damages as a penalty, which the parties agree represents a fair and reasonable estimate of the County's actual damages at the time of contracting if the Contractor fails to achieve Final Acceptance of the Work in a timely manner.

D. When any period of time is referenced by days herein, it shall be computed to include the first day and last day of such period. All days shall mean calendar day and not business day.

E. Any agreed upon changes to the Contract Time must be accomplished by an approved, written County Project Modification in the form attached to this Agreement.

Section 6. Exhibits Incorporated.

The following documents are expressly agreed to be incorporated by reference and made a part of this Agreement:

- A. Scope of Services
- B. Fee Schedule
- C. Legal Advertisement
- D. Invitation to Bid and all addenda, including the Project Plans
- E. Bid Form and Required Documents
- F. Public Construction Performance and Payment Bond
- G. Standard Specifications
- H. Insurance Requirements, including Certificates of Insurance
- I. Form of Release and Affidavit
- J. County Project Modification
- K. Supplemental Specifications
- L. Special Provisions
- M. Technical Special Provisions
- N. FDOT and Lee County Design Standards
- O. Developmental Specifications
- P. Other relevant forms

Section 7. Public Records.

A. In addition to other requirements provided herein, Contractor shall comply with public records laws embodied in Chapter 119, Florida Statutes, and specifically shall:

A.1. Keep and maintain public records required by the County in order to perform the Scope of Services identified herein.

A.2. Upon request from the County provide the County with any requested public records or allow the requested records to be inspected or copied within a reasonable time by the County.

A.3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the Agreement term and thereafter if the Contractor does not transfer all records to the County.

A.4. Transfer, at no cost, to County all public records in possession of the Contractor upon termination of this Agreement and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the County, upon request from the County, in a format that is compatible with the information technology systems of the County. If the Contractor keeps and maintains public records upon the conclusion of this Agreement, the Contractor shall meet all applicable requirements for retaining public records that would apply to the County.

B. If Contractor does not comply with a public records request, the County shall treat that omission as a breach of this Agreement and enforce the Contract provisions accordingly. Additionally, if the Contractor fails to provide records when requested, the Contractor may be subject to penalties under Section 119.10, Florida Statutes, and reasonable costs of enforcement, including attorney fees.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 239-533-2221, 2115 SECOND STREET, FORT MYERS, FL 33901, publicrecords@leegov.com; <http://www.leegov.com/publicrecords>.

Section 8. Audit.

A. Upon execution of the Contract, the County reserves the right to conduct an audit of the Contractor's records pertaining to the Project. The County or its representatives may conduct an audit, or audits, at any time prior to final payment, or thereafter pursuant to 5-12 of the Standard Specifications. The County may also require

submission of the records from either the Contractor or any subcontractor or material supplier. As the County deems necessary, records include all books of account, supporting documents, and papers pertaining to the cost of performance of the Work.

B. The Contractor must retain all records pertaining to the Contract for a period of not less than five (5) years from the date of the Director's final acceptance of the Project, unless a longer minimum period is otherwise specified. Upon request, make all such records available to the County or its representative(s). For the purpose of this section, records include but are not limited to all books of account, supporting documents, and papers that the County deems necessary to ensure compliance with the provisions of the Contract Documents.

C. If the Contractor fails to comply with these requirements, the County may disqualify or suspend the Contractor from bidding on or working as a subcontractor on future Contracts.

D. The Contractor must ensure that the subcontractors provide access to their records pertaining to the project upon request by the County.

Section 9. Indemnification and Insurance.

A. Contractor agrees to save harmless, indemnify, and defend or, at the option of the County, pay the cost of defense, the County and its representative from any and all claims, losses, penalties, demands, judgments, and costs of suit, including attorneys' fees and paralegals' fees, for any expense, damage or liability incurred by any of them, whether for personal injury, property damage, direct or consequential damages, or economic loss, arising directly or indirectly on account of or in connection with the Work performed by Contractor under this Agreement or by any person, firm or corporation to whom any portion of the Work is subcontracted by Contractor or resulting from the use by Contractor, or by any one for whom Contractor is legally liable, of any materials, tools, machinery or other property of the County. This provision is intended to apply even if the injury or damage is caused in whole or in part by any act, omission or default of the County or Engineer of Record or their consultants, agents, officers and employees. The County and Contractor agree the first \$100.00 of the Contract Amount paid by the County to Contractor shall be given as separate consideration for this indemnification, and any other indemnification of the County by Contractor provided for within the Contract Documents, the sufficiency of such separate consideration being acknowledged by Contractor by Contractor's execution of the Agreement. The Contractor's obligation under this provision shall not be limited in any way by the agreed upon Contract Amount as shown in this Contract or the Contractor's limit of, or lack of, sufficient insurance protection.

B. The Contractor guarantees the payment of all just claims for materials, supplies, tools, or labor and other just claims against him or any subcontractor, in connection with the Contract. The Department's final acceptance and payment does not release the Contractor's bond until all such claims are paid or released.

C. Contractor shall obtain and carry, at all times during its performance under the Contract Documents, insurance of the types and in the amounts set forth in the Insurance Requirements attached to this Agreement. All insurance policies shall be from responsible companies duly authorized to do business in the State of Florida and/or responsible risk retention group insurance companies which are registered with the State of Florida. Prior to execution of the Agreement, Contractor shall provide the County with properly executed Certificates of Insurance to evidence Contractor's compliance with the insurance requirements of the Contract Documents. Said Certificates of Insurance shall be on forms approved by the County. The Certificates of Insurance shall be personally, manually signed by the authorized representatives of the insurance company/companies shown on the Certificates of Insurance, with proof that they are authorized representatives thereof. In addition, certified, true and exact copies of all insurance policies required hereunder shall be provided to the County, on a timely basis, when requested by the County.

D. The Certificates of Insurance and required insurance policies shall contain provisions that thirty (30) calendar days prior written notice by registered or certified mail shall be given to the County of any cancellation, intent not to renew, or reduction in the policies or coverages, except in the application of the aggregate limits provisions. In the event of a reduction in the aggregate limit of any policy, Contractor shall immediately take steps to have the aggregate limit reinstated to the full extent permitted under such policy.

E. To the extent multiple insurance coverage and/or County's self-insured retention may apply, any and all insurance coverage purchased by Contractor and its Subcontractors identifying the County as an additional named insured shall be primary. The acceptance by the County of any Certificate of Insurance does not constitute approval or agreement by the County that the insurance requirements have been satisfied or that the insurance policy shown on the Certificate of Insurance is in compliance with the requirements of the Contract Documents. No Work shall commence at the Project Site unless and until the required Certificates of Insurance are received by the County.

F. The Contractor will be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts they may be liable to the same extent that they are employed by him. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor and the County. The County may, upon request, furnish to any Subcontractor, to the extent practicable, evidence of amounts paid to the Contractor on account of specific Work done.

G. Contractor shall require each of its Subcontractors to procure and maintain, until the completion of the Subcontractor's work, insurance of the types and to the limits specified in the Insurance Requirements attached to this Agreement, unless such insurance requirements for the Subcontractor are expressly waived in writing by the County. All liability insurance policies, other than professional liability, workers' compensation, employer's liability and business auto liability policies, obtained by Contractor to meet the requirements of the Contract Documents shall name the County

and Engineer of Record as additional insureds. If any insurance provided pursuant to the Contract Documents expires prior to the completion of the Work, renewal Certificates of Insurance and, if requested by the County, certified, true copies of the renewal policies, shall be furnished by Contractor within thirty (30) calendar days prior to the date of expiration.

H. Should at any time the Contractor not maintain the insurance coverages required herein, the County may terminate the Agreement or at its sole discretion shall be authorized to purchase such coverages and charge the Contractor for such coverages purchased. The County shall be under no obligation to purchase such insurance, nor shall it be responsible for the coverages purchased or the insurance company or companies used. The decision of the County to purchase such insurance coverages shall in no way be construed to be a waiver of any of its rights under the Contract Documents.

I. Contractor shall submit to Engineer of Record a copy of all accident reports arising out of any injuries to its employees or those of any firm or individual to whom it may have subcontracted a portion of the Work, or any personal injuries or property damages arising or alleged to have arisen on account of any Work by Contractor under the Contract Documents.

Section 10. Compliance with Laws and Regulations

A. Contractor agrees to comply, at its own expense, with all federal, state, and local Laws and Regulations, including federal, state and local laws, codes, statutes, ordinances, rules, regulations and requirements applicable to the Project, including but not limited to those dealing with taxation, workers' compensation, equal employment and safety. If Contractor observes that the Contract Documents are at variance therewith, it shall promptly notify the County and Engineer of Record in writing.

B. Legal Requirements and provisions concerning Laws and Regulations to be observed are provided in Division 1, Section 7 of the Standard Specifications attached hereto as Exhibit G.

Section 11. Warranty

A. Contractor shall obtain and assign to the County all express warranties given to Contractor or any Subcontractors by any materialmen supplying materials, equipment or fixtures to be incorporated into the Project.

B. Contractor warrants to the County that any materials and equipment furnished under the Contract Documents shall be new unless otherwise specified, and that all Work shall be of good quality, free from all defects and in conformance with the Contract Documents. Contractor further warrants to the County that all materials and equipment furnished under the Contract Documents shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturers, fabricators, Suppliers or processors except as otherwise

provided for in the Contract Documents. If, within one (1) year after Final Acceptance, any Work is found to be Defective or not in conformance with the Contract Documents, Contractor shall correct it promptly after receipt of written notice from the County. Contractor shall also be responsible for and pay for replacement or repair of adjacent materials or Work which may be damaged as a result of such replacement or repair. These warranties are in addition to those express or implied warranties to which the County is entitled as a matter of law.

C. The Contractor warrants and guarantees that title to all Work, materials and equipment covered by an application for progress payment, whether incorporated in the Project or not, will be passed to the County prior to the next application for progress payment, free and clear of all liens, claims, security interest and encumbrances; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor or by any other person performing the Work at the site or furnishing materials and equipment for the Project subject to an agreement under which an interest therein or encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

Section 12. Notices.

A. All notices required or made pursuant to this Agreement by the Contractor to the County shall be in writing and delivered by hand or by United States Postal Service, first class mail, postage pre-paid, return receipt requested, or by courier, addressed to the following:

Roger Desjarlais
Lee County Manager
P.O. Box 398
Fort Myers, FL 33902

With copies addressed to each of the following:

Avelino Cancel, Project Manager, P.O. Box 398, Fort Myers, FL 33902

Mary Tucker, Procurement Management Director, P.O. Box 398, Fort Myers, FL 33902

Randy Cerchie, Department of Transportation Director, P.O. Box 398, Fort Myers, FL 33902

B. All notices required or made pursuant to this Agreement by the County to Contractor shall be made in writing and shall be delivered by hand or by United States Postal Service, first class mail, postage pre-paid, return receipt requested, or by courier, addressed to the following:

[Corporate Name of Contractor]

Attention: [Name of person with their title to whose attention the notice should be sent]

[Address (including city, state and zip)]

Telephone: [Telephone Number] Fax: [Fax Number]

C. Either party may change its above noted address by giving written notice to the other party in accordance with the requirements of this Section.

Section 13. Modification.

No modification or change to the Agreement shall be valid or binding upon the parties unless in writing and executed by the appropriate parties intended to be bound by it.

Section 14. Successors and Assigns.

Subject to other provisions hereof, the Agreement shall be binding upon and shall inure to the benefit of the successors and assigns of the parties to the Agreement.

Section 15. No Waiver.

The failure of the County to enforce, at any time or for any period of time, any one or more of the provisions of the Agreement shall not be construed to be, and shall not be, a waiver of any such provision or provisions or of its right thereafter to enforce each and every such provision.

Section 16. Federal Requirements

A. In the event this Project is funded in whole or in part from any granting agency or source, the specific terms, regulations and requirements governing the disbursement of those funds are incorporated by reference and made a part of the Contract Documents.

Section 17. Entire Agreement.

Each of the parties hereto agrees and represents that the Agreement comprises the full and entire agreement between the parties affecting the Work contemplated, and no other agreement or understanding of any nature concerning the same has been entered into or will be recognized, and that all negotiations, acts, Work performed, or payments made prior to the execution hereof shall be deemed merged in, integrated and superseded by the Agreement.

Section 18. Severability.

Should any provision of the Agreement be determined by a court to be unenforceable, such a determination shall not affect the validity or enforceability of any other section or part thereof.

IN WITNESS WHEREOF, the parties have executed this Agreement on the date(s) indicated below.

WITNESS:

CONTRACTOR: [Contractor Name]

Signed By: _____

Signed By: _____

Print Name: _____

Print Name: _____

Title: _____

Date: _____

OWNER: LEE COUNTY

BOARD OF COUNTY COMMISSIONERS
OF LEE COUNTY, FLORIDA

BY: _____

CHAIR

DATE: _____

ATTEST:
CLERK OF THE CIRCUIT COURT
Linda Doggett, Clerk

BY: _____

APPROVED AS TO FORM FOR THE
RELIANCE OF LEE COUNTY ONLY:

BY: _____
OFFICE OF THE COUNTY ATTORNEY

EXHIBIT A

SCOPE OF SERVICES

Contractor shall provide Bridge Maintenance and Repair services in accordance with the Solicitation and County Project Authorizations issued under this Agreement, if any.

A. County Project Authorization

The term County Project Authorization refers to a written document executed by both parties under this Agreement setting forth and authorizing a limited number of services, tasks, or work for a specific project identified by the County. Such services, tasks, or work is consistent with and has previously been described by the Solicitation and this Agreement.

B. Award of County Project Authorizations

As provided by the Solicitation, individual projects may be awarded and authorized via County Project Authorization, to any of the firms approved by the Board of County Commissioners under that solicitation. Award shall be made as follows:

- Any project/task with a total cost of \$50,000.00 or less may be awarded to any firm holding a valid contract under this bid able to meet the required project schedule.

- Any project/task with a total cost of \$50,000.01, but less than \$500,000.00 shall be quoted by a minimum of three (3) of the approved firms holding a valid contract under Solicitation No B190142TJM. If there are fewer than three (3) approved firms holding a valid contract under this Solicitation, then all of the firms shall quote the project/task. When quotes are requested, the Contractor's submittal shall be based on the unit prices provided by Exhibit B, or lower prices. The quote shall not list any prices that are higher. Award of the project shall be made to the firm holding a valid contract under the Solicitation, with the lowest quoted price, able to meet the required project schedule.

C. Changes to County Project Authorizations

A modification to a County Project Authorization may be authorized by a County Project Modification properly executed by both parties.

D. Additional Purchases

If the County requires the Contractor to perform additional services or provide additional product(s) related to this Agreement, then the Contractor shall be entitled to additional compensation based on the Fee Schedule as amended to the extent necessary to accommodate such additional work or product(s). The additional compensation shall be agreed upon before commencement of any additional services or provision of additional

product(s) and shall be authorized by a County Project Modification to a County Project Authorization. The County will not pay for any additional service, work performed or product provided before a properly executed County Project Modification.

Notwithstanding the preceding, in the event additional services are required as a result of error, omission or negligence of the Contractor, the Contractor will not be entitled to additional compensation.

E. Performance of Work under this Agreement

All work shall be provided and performed in accordance with the Specifications of the Solicitation and as further described in any County Project Authorizations issued under this Agreement.

EXHIBIT B
FEE SCHEDULE

Payment for actual Work completed shall be made in accordance with the terms of this Agreement and any County Project Authorizations issued hereunder. All project pricing shall be determined by the rates established by the Contractor's response to the Solicitation, attached hereto and incorporated herein as Exhibit E. All quotes received by the County from the Contractor shall reflect pricing at or below the rates listed in this Exhibit E.

Notwithstanding the preceding, in the event additional services are required as a result of error, omission or negligence of the Contractor, the Contractor will not be entitled to additional compensation.

EXHIBIT C
LEGAL ADVERTISEMENT

EXHIBIT D
INVITATION TO BID

[Include the entire bid package with all addenda, plans and drawings.]

EXHIBIT E
BID FORM AND REQUIRED DOCUMENTS

[Include the Contractor's bid submission: the bid form and all the documents required by the solicitation.]

EXHIBIT F
PUBLIC CONSTRUCTION PERFORMANCE AND PAYMENT BOND

By this bond, we [Name of Contractor], as **Principal**, and [Name of Surety], as **Surety**, are bound to **Lee County Board of County Commissioners**, a political subdivision of the State of Florida, herein called **Owner**, in the sum of **[Total Contract Price]**, for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND IS that is that if Principal:

1. Performs this contract dated _____, 20____, between Principal and Owner for construction of improvements known as **Bridge Maintenance and Repairs** located as **specified in B190142TJM**, under Lee County Solicitation No. [Solicitation number], the contract being made a part of this bond by reference, at the times and in the manner prescribed in the contract; and
2. Promptly makes payments to all claimants, as defined in Section 255.05 (1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the contract; and
3. Pays Owner all losses, damages, expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a default by Principal under the contract; and
4. Performs the guarantee of all work and materials furnished under the contract for the time specified in the contract, then this bond is void; otherwise it remains in full force.

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2), Florida Statutes.

Any changes in or under the contract documents and compliance or noncompliance with any formalities connected with the contract or the changes do not affect Surety's obligation under this bond.

	OWNER	PRINCIPAL	SURETY
NAME	Lee County Board of County Commissioners	[Name of Contractor]	[Name of Surety]
ADDRESS	2115 Second St. Fort Myers, FL 33901	[Principal Business Address of Contractor]	[Principal Business Address of Surety]
PHONE NUMBER	239-533-2221	[Principal Business Phone of Contractor]	[Principal Business Phone of Surety]

[Name of Contractor]

DATED THIS _____ DAY
OF _____, 2_____

By: _____
[Printed Name and Title of Signer]

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ day of _____, 20____, by [name of person acknowledging].

Signature of Notary Public

(NOTARY SEAL)

[Name of Notary Typed, Printed, or Stamped]

Personally Known _____ OR Produced Identification _____
Type of Identification Produced:

[Name of Surety]

DATED THIS _____ DAY
OF _____, 2_____

By: _____
[Printed Name] as Attorney in Fact

Address: _____

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ day of _____, 20____, by [name of person acknowledging].

Signature of Notary Public

(NOTARY SEAL)

[Name of Notary Typed, Printed, or Stamped]

Personally Known _____ OR Produced Identification _____
Type of Identification Produced:

EXHIBIT G
STANDARD SPECIFICATIONS

The Standard Specifications comprise Divisions I, II and III as noted below:

1. Division I General Requirements and Covenants, Sections 1-9 as included herein.
2. Division II-Construction Details and Division III-Materials refer to the January, 2019 edition of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, available at the following link:

<http://www.fdot.gov/programmanagement/Implemented/SpecBooks/>

DIVISION I

General Requirements and Covenants

SECTION 1

DEFINITIONS AND TERMS

1-1 General.

These Specifications are written to the bidder, prior to award of the Contract, and to the Contractor. Within Divisions I and II of the specifications, sentences that direct the Contractor to perform work are written in the active voice-imperative mood. These directions to the Contractor are written as commands. In the imperative mood, the subject “the bidder” or “the Contractor” is understood.

All other requirements to be performed by others, with the exception of the Method of Measurement and the Basis of Payment Articles, have been written in the active voice, but not in the imperative mood. Sentences written in the active voice identify the party responsible for performing the action. For example, “The Engineer will determine the density of the compacted material.” Certain requirements of the Contractor may also be written in the active voice, rather than active voice-imperative mood.

Division III of the Specifications (Materials) is written in the passive voice writing style.

1-2 Abbreviations.

The following abbreviations, when used in the Contract Documents, represent the full text shown.

AAN	American Association of Nurserymen, Inc.
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGC	The Associated General Contractors of America, Inc.
AGMA	American Gear Manufacturers Association
AIA	American Institute of Architects.
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute, Inc.
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWG	American Wire Gauge
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
CRSI	Concrete Reinforcing Steel Institute
EASA	Electrical Apparatus Service Association
EPA	Environmental Protection Agency of the United States Government
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FSS	Federal Specifications and Standards
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society

IPCEA	Insulated Power Cable Engineers Association
ISO	International Organization for Standards
MASH	AASHTO Manual for Assessing Safety Hardware
MUTCD	Manual on Uniform Traffic Control Devices
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NIST	National Institute for Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
OSHA	Occupational Safety and Health Administration
SAE	Society of Automotive Engineers
SI	International System of Units
SSPC	Society of Protective Coatings
UL	Underwriters' Laboratories

Each of the above abbreviations, when followed by a number or letter designation, or combination of numbers and letters, designates a specification, test method, or other code or recommendation of the particular authority or organization shown.

Use standards, specifications, test methods, or other codes as specified in the current edition at the time of the bid opening.

1-3 Definitions.

The following terms, when used in the Contract Documents, have the meaning described

Advertisement.

The public announcement, as required by law, inviting bids for work to be performed or materials to be furnished, usually issued as “Notice to Contractors,” or “Notice to Bidders.”

Article.

The numbered prime subdivision of a Section of these Specifications.

Bidder.

An individual, firm, or corporation submitting a proposal for the proposed work.

Bridge.

A structure, including supports, erected over a depression or over an obstruction such as water, highway or railway, or for elevated roadway, for carrying traffic or other moving loads, and having a length, measured along the center of the roadway, of more than 20 feet between the inside faces of end supports. A multiple-span box culvert is considered a bridge, where the length between the extreme ends of the openings exceeds 20 feet.

Calendar day.

Every day shown on the calendar, ending and beginning at midnight.

Chair.

The Chairman of the Lee County Board of County Commissioners.

Change Order.

See definition for Supplemental Agreement.

Construction Engineering and Inspection (CEI) Consultant.

The consultant contracted by the Department for professional services during the construction phase of the project, or a qualified person in the firm’s employ authorized as his official representative. In the absence of such a contract, the duties of the CEI Consultant will be fulfilled by

the Department Project Manager. The CEI Consultant is not authorized to issue change orders to the contract sum, contract time, or scope of work.

Contract.

The term “Contract” means the entire and integrated agreement between the parties thereunder and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract Documents form the Contract between the Department and the Contractor setting forth the obligations of the parties thereunder, including, but not limited to, the performance of the Work and the basis of payment.

Contract Claim (Claim).

A written demand submitted to the Department by the Contractor in compliance with 5-12.3 seeking additional monetary compensation, time, or other adjustments to the Contract, the entitlement or impact of which is disputed by the Department.

Contract Documents.

The term “Contract Documents” includes: this Agreement, the Exhibits described in Section 6 of the Agreement, the legal advertisement, the instructions to bidders, the Proposal and Proposal Forms, the solicitation documents and any duly executed and issued addenda, Change Orders, Field Directive Change Orders, and amendments relating thereto, all of which are to be treated as one instrument whether or not set forth at length in the form of contract.

Contract Bond or Performance Bond.

The security furnished by the Contractor and the surety as a guaranty that the Contractor shall fulfill the terms of the Contract and pay all legal debts pertaining to the construction of the project.

Contract Letting.

The date that the Department opened the bid proposals.

Contract Time.

The number of calendar days allowed for completion of the Contract work, including authorized time extensions.

Contractor.

The individual, firm, joint venture, or company contracting with the Department to perform the work.

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 Cost Savings Initiative Proposal, 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 Department-approved Specialty Engineer. For items of the permanent work declared by the State Construction Office to be ”major” or “structural”, the work performed by a Department-approved Specialty Engineer must be checked by another Department-approved Specialty Engineer. An individual Engineer may become a Department-approved Specialty Engineer

if the individual meets the Professional Engineer experience requirements set forth within the individual work groups in Chapter 14-75, Rules of the Department of Transportation, Florida Administrative Code. Department-approved Specialty Engineers are listed on the State Construction Website. Department-approved Specialty Engineers will not be authorized to perform redesigns or Cost Savings Initiative Proposal designs of items fully detailed in the Plans.

Controlling Work Items.

The activity or work item on the critical path having the least amount of total float. The controlling item of work will also be referred to as a Critical Activity.

County.

The Board of County Commissioners of Lee County, Florida, as Owner.

Culverts.

Any structure not classified as a bridge that provides an opening under the roadway.

Delay.

Any unanticipated event, action, force or factor which extends the Contractor's time of performance of any controlling work item under the Contract. The term "delay" is intended to cover all such events, actions, forces or factors, whether styled "delay", "disruption", "interference", "impedance", "hindrance", or otherwise, which are beyond the control of and not caused by the Contractor, or the Contractor's subcontractors, materialmen, suppliers or other agents. This term does not include "extra work".

Department.

As used in Divisions II and III of the Standard Specifications, the Department shall mean the County.

Department Project Manager.

An employee of Lee County designated by the Director as the representative of the Board of County Commissioners in matters concerning the project. The Department Project Manager will act in the role of the CEI Consultant in the absence of a contract with a third party consultant. The Department Project Manager is not authorized to issue changes to the Contract Amount, Contract Time, or Scope of Work without the express approval by the Director, County Manager, and/or Board of County Commissioners as may be applicable.

Developmental Specification.

See definition for Specifications.

Director.

The Director of the Lee County Department of Transportation, acting directly or through duly authorized representatives; such representatives acting within the scope of the duties and authority assigned to them. 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 Director," "to the Director," or "of the Director."

Engineer.

As used in Divisions II and III of the Standard Specifications, the Engineer shall mean the Director.

Engineer of Record.

The Professional Engineer or Engineering Firm registered in the State of Florida that develops the criteria and concept for the project, performs the analysis, and is responsible for the preparation of the Plans and Specifications. The Engineer of Record may be Departmental in-house staff or a consultant retained by the Department.

The Contractor shall not employ the Engineer of Record as the Contractor's Engineer of Record or as a Specialty Engineer.

Equipment.

The machinery and equipment, together with the necessary supplies for upkeep and maintenance thereof, and all other tools and apparatus necessary for the construction and acceptable completion of the work.

Extra Work.

Any "work" which is required by the Director to be performed and which is not otherwise covered or included in the project by the existing Contract Documents, whether it be in the nature of additional work, altered work, deleted work, work due to differing site conditions, or otherwise. This term does not include a "delay".

Federal, State, and Local Rules and Regulations.

The term "Federal, State and Local Rules and Regulations" includes: any and all Federal, State, and Local laws, bylaws, ordinances, rules, regulations, orders, permits, or decrees including environmental laws, rules, regulations, and permits.

Field Directive Change Orders.

A written order making a minor amendment to the Agreement, which is signed by the Contractor and approved in accordance with County policies and procedures. An amendment is minor if it does not change: (i) the scope of the Project, (ii) the Contract Amount, or (iii) the Contract Time.

All Field Directive Change Orders shall be summarized and approved as a Supplemental Agreement or Change Order prior to Project close-out.

Financial Project Identification Number.

If applicable, the Florida Department of Transportation Financial Project Identification Number (FPID).

FDOT.

The Florida Department of Transportation, an agency of the State of Florida.

Highway, Street, or Road.

A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

Holidays.

Days designated by the Lee County Board of County Commissioners as holidays.

Inspector.

An authorized representative of the Director, assigned to make official inspections of the materials furnished and of the work performed by the Contractor.

Laboratory.

The official testing laboratory used by the Department.

Laws and Regulations .

Any and all applicable laws rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

Major Item of Work.

Any item of work having an original Contract value in excess of 5% of the original Contract amount.

Materials.

Any substances to be incorporated in the work under the Contract.

Median.

The portion of a divided highway or street separating the traveled ways for traffic moving in opposite directions.

Plans.

The approved Plans, including reproductions thereof, showing the location, character, dimensions, and details of the work.

Project.

The entire undertaking of the County, identified by County as indicated in the Exhibits of the Contract, of which the Work to be provided under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.

Project Number.

The Lee County project number as listed in the Advertisement.

Proposal (Bid, Bid Proposal).

The offer of a bidder, on the prescribed form, to perform the work and to furnish the labor and materials at the prices quoted.

Proposal Form.

The official form on which the Department requires formal bids to be prepared and submitted for the work.

Proposal Guaranty

The security furnished by the bidder as guaranty that the bidder will enter into the Contract for the work if the Department accepts the proposal.

Right-of-Way.

The land that the Department has title to, or right of use, for the road and its structures and appurtenances, and for material pits furnished by the Department.

Roadbed.

The portion of the roadway occupied by the subgrade and shoulders.

Roadway.

The portion of a highway within the limits of construction.

Secretary.

As used in Divisions II and III of the Standard Specifications, the Secretary shall mean the Chair.

Section.

A numbered prime division of these Specifications.

Site.

The real property or other areas designated in the Contract Documents as being furnished by County for the performance of the Work, storage, or access.

Special Event.

Any event, including but not limited to, a festival, fair, run or race, motorcade, parade, civic activity, cultural activity, charity or fund drive, sporting event, or similar activity designated in the Contract Documents.

Special Provisions.

See definition for Specifications.

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. The Specialty Engineer may also provide designs and details, repair designs and details, or perform Engineering Analyses for items of the permanent work declared by the State Construction Office to be “minor” or “non-structural”.

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.

Specifications.

The directions, provisions, and requirements contained herein, together with all stipulations contained in the Contract Documents, setting out or relating to the method and manner of performing the work, or to the quantities and qualities of materials and labor to be furnished under the Contract.

Standard Specifications: Specifications for construction applicable to all Department Contracts containing adopted requirements, setting out or relating to the method or manner of performing work, or to the quantities and qualities of materials and labor. The Standard Specifications comprise three Divisions, as follows:

Division I: “Lee County Department of Transportation Division I General Requirements and Covenants” contained in the Contract Documents.

Division II and III: Divisions II and III of the “FDOT Standard Specifications for Road and Bridge Construction”, as otherwise amended herein. The applicable version is cited in the Special Provisions.

Supplemental Specifications: Approved additions and revisions to Divisions II and III of the Standard Specifications, applicable to all Department Contracts.

Special Provisions: Specific clauses adopted by the Department that add to or revise the Standard Specifications or supplemental specifications, setting forth conditions varying from or additional to the Standard Specifications applicable to a specific project.

Technical Special Provisions: Specifications, of a technical nature, prepared, signed, and sealed by an Engineer registered in the State of Florida that are made part of the Contract as an attachment to the Contract Documents.

Standard Plans.

“Standard Plans for Road and Bridge Construction”, an electronic book describing and detailing aspects of the Work. Where the term Design Standards appears in the Contract Documents, it will be synonymous with Standard Plans.

Standard Specifications.

See definition for Specifications.

State.

State of Florida.

Subarticle.

A headed and numbered subdivision of an Article of a Section of these Specifications.

Subgrade.

The portion of the roadbed immediately below the base course or pavement, including below the curb and gutter, valley gutter, shoulder and driveway pavement. The subgrade limits ordinarily include those portions of the roadbed shown in the Plans to be constructed to a design bearing value or to be otherwise specially treated. Where no limits are shown in the Plans, the subgrade section extends to a depth of 12 inches below the bottom of the base or pavement and outward to 6 inches beyond the base, pavement, or curb and gutter.

Substructure.

All of that part of a bridge structure below the bridge seats, including the parapets, backwalls, and wingwalls of abutments.

Superintendent.

The Contractor's authorized representative in responsible charge of the work.

Superstructure.

The entire bridge structure above the substructure, including anchorage and anchor bolts, but excluding the parapets, backwalls, and wingwalls of abutments.

Supplemental Agreement

A written agreement between the Contractor and the Department, modifying the Contract within the limitations set forth in these Specifications, may also be referred to as a Change Order.

Supplemental Specifications

See definition for Specifications.

Surety.

The corporate body that is bound by the Contract Bond with and for the Contractor and responsible for the performance of the Contract and for payment of all legal debts pertaining thereto.

Technical Special Provisions.

See definition for Specifications.

Traveled Way.

The portion of the roadway providing for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

Unilateral Payment.

A payment of money made to the Contractor by the Department for sums the Department determines to be due to the Contractor for work performed on the project, and whereby the Contractor by acceptance of such payment does not waive any rights the Contractor may otherwise have against the Department for payment of any additional sums the Contractor claims are due for the work.

Work.

All labor, materials and incidentals required to execute and complete the requirements of the Contract including superintendence, use of equipment and tools, and all services and responsibilities prescribed or implied.

Work Order.

A written agreement between the Contractor and the Department modifying the Contract within the limitations set forth in these Specifications. Funds for this agreement are drawn against the Initial Contingency Pay Item or a Contingency Supplemental Agreement.

Working Day.

Any calendar day on which the Contractor works or is expected to work in accordance with the approved work progress schedule.

SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS

2-1 Reserved

2-2 Reserved

2-3 Interpretation of Estimated Quantities.

2-3.1 Lump Sum Contracts: The Contractor is responsible for the determination of the quantities for those items constructed within the authorized plan limits or dimensions.

The County does not assume any responsibility for any incidental information in bid documents that may be construed as a quantity of work and/or materials.

2-3.2 Contracts other than Lump Sum: For those items constructed within authorized plan limits or dimensions, use the quantities shown in the Plans and in the Proposal Form as the basis of the bid. The County will also use these quantities for final payment as limited by the provisions for the individual items. For those items having variable final pay quantities that are dependent on actual field conditions, use and measurement, the quantities shown in the Plans and in the Proposal Form are approximate and provide only a basis for calculating the bid upon which the County will award the Contract. Where items are listed for payment as lump sum units and the Plans show estimates of component quantities, the County is responsible for the accuracy of those quantities limited to the provisions of 9-3.3. Where items are listed for payment as lump sum units and the Plans do not show estimates of component quantities, the Contractor is solely responsible for their own estimates of such quantities.

The County may increase, decrease, or omit the estimated quantities of work to be done or materials to be furnished.

2-4 Examination of Plans, Specifications, Special Provisions and Site of Work.

The Contractor is responsible for examining the Contract Documents and the site of the proposed Work carefully before submitting a Proposal for the Work contemplated. Contractor shall investigate the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of all Contract Documents.

The County does not guarantee the details pertaining to borings, as shown in the Plans, to be more than a general indication of the materials likely to be found adjacent to holes bored at the site of the work, approximately at the locations indicated. The Contractor shall examine boring data, where available, and make their own interpretation of the subsoil investigations and other preliminary data, and shall base their bid solely on their own opinion of the conditions likely to be encountered.

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

2-5 Reserved

2-6 Reserved

2-7 Reserved

2-8 Reserved

2-9 Reserved

2-10 Reserved

2-11 Reserved

2-12 Material, Samples and Statement.

The County may require that the Contractor furnish a statement of the origin, composition, and manufacture of any and all materials to be used in the construction of the work, together with samples that may be subjected to the tests provided for in these Specifications to determine the materials' quality and fitness for the work.

SECTION 3

RESERVED

SECTION 4 SCOPE OF THE WORK

4-1 Intent of Contract.

The intent of the Contract is to provide for the construction and completion in every detail of the Work described in the Contract. Furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the Contract Documents.

4-2 Work not covered by Standard Specifications.

Proposed construction and any contractual requirements not covered by these Standard Specifications may be covered by Contract Plan notes or by Supplemental Specifications or Special Provisions for the Contract, and all requirements of such Supplemental Specifications or Special Provisions shall be considered as a part of these Specifications.

4-3 Alteration of Plans or of Character of Work.

4-3.1 General: The Director reserves the right to make, at any time prior to or during the progress of the work, such increases or decreases in quantities, whether a significant change or not, and such alterations in the details of construction, whether a substantial change or not, including but not limited to alterations in the grade or alignment of the road or structure or both, as may be found necessary or desirable by the Director. Such increases, decreases or alterations shall not constitute a breach of Contract, shall not invalidate the Contract, nor release the Surety from any liability arising out of this Contract or the Surety bond. Minor increases, decreases or alterations that do not change the scope of the Project, the Project cost, or the Contract Time may be initially authorized in a Field Directive Change Order. The Contractor agrees to perform the work, as altered, the same as if it had been a part of the original Contract. All Field Directive Change Orders shall be approved as a Supplemental Agreement pursuant to 4-3.4 prior to Project close-out.

The term "significant change" applies only when:

1. The Director 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, or
2. A major item of work, as defined in 1-3, is increased in excess of 125% or decreased below 75% of the original Contract quantity. The County will apply any price adjustment for an increase in quantity only to that portion in excess of 125% of the original Contract item quantity in accordance with 4-3.2 below. In the case of a decrease below 75% the County will only apply a price adjustment for the additional costs that are a direct result of the reduction in quantity.

In (1) above, the determination by the Director shall be conclusive. If the determination is challenged by the Contractor in any proceeding, the Contractor must establish by clear and convincing proof that the determination by the Director was without any reasonable basis.

4-3.2 Increase, Decrease or Alteration in the Work: The Director reserves the right to make alterations in the character of the work which involve a substantial change in the nature of the design or in the type of construction or which materially increases or decreases the cost or time of performance. Such alteration shall not constitute a breach of Contract, shall not invalidate the Contract or release the Surety.

Notwithstanding that the Contractor shall have no formal right whatsoever to any extra compensation or time extension deemed due by the Contractor for any cause unless and until the Contractor follows the procedures set forth in 5-12.2 for preservation, presentation and resolution of the claim, the Contractor may at any time, after having otherwise timely submitted a

notice of intent to claim or preliminary time extension request pursuant to 5-12.2 and 8-7.3.2, submit to the County a request for equitable adjustment of compensation or time or other dispute resolution proposal. The Contractor shall in any request for equitable adjustment of compensation, time, or other dispute resolution proposal certify under oath and in writing, in accordance with the formalities required by Florida law, that the request is made in good faith, that any supportive data submitted is accurate and complete to the Contractor's best knowledge and belief, and that the amount of the request accurately reflects what the Contractor in good faith believes to be the County's responsibility. Such certification must be made by an officer or director of the Contractor with the authority to bind the Contractor. Any such certified statements of entitlement and costs shall be subject to the audit provisions set forth in 5-12.14. While the submittal or review of a duly certified request for equitable adjustment shall neither create, modify, nor activate any legal rights or obligations as to the Contractor or the County, the County will review the content of any duly certified request for equitable adjustment or other dispute resolution proposal, with any further action or inaction by the County thereafter being in its sole discretion. Any request for equitable adjustment that fails to fully comply with the certification requirements will not be reviewed by the County.

The monetary compensation provided for below constitutes full and complete payment for such additional work and the Contractor shall have no right to any additional monetary compensation for any direct or indirect costs or profit for any such additional work beyond that expressly provided below. The Contractor shall be entitled to a time extension only to the extent that the performance of any portion of the additional work is a controlling work item and the performance of such controlling work item actually extends completion of the project due to no fault of the Contractor. All time related costs for actual performance of such additional work are included in the compensation already provided below and any time extension entitlement hereunder will be without additional monetary compensation. The Contractor shall have no right to any monetary compensation or damages whatsoever for any direct or indirect delay to a controlling work item arising out of or in any way related to the circumstances leading up to or resulting from additional work (but not relating to the actual performance of the additional work, which is paid for as otherwise provided herein), except only as provided for under 5-12.6.2.1.

4-3.2.1 Allowable Costs for Extra Work: The Director may direct in writing that extra work be done and, at the Director's sole discretion, the Contractor will be paid pursuant to an agreed Supplemental Agreement or in the following manner:

1. Labor and Burden: The Contractor will receive payment for actual costs of direct labor and burden for the additional or unforeseen work. Labor includes foremen actually engaged in the work; and will not include project supervisory personnel nor necessary on-site clerical staff, except when the additional or unforeseen work is a controlling work item and the performance of such controlling work item actually extends completion of the project due to no fault of the Contractor. Compensation for project supervisory personnel, but in no case higher than a Project Manager's position, shall only be for the pro-rata time such supervisory personnel spent on the contract. In no case shall an officer or director of the Company, nor those persons who own more than 1% of the Company, be considered as project supervisory personnel, direct labor or foremen hereunder.

Payment for burden shall be limited solely to the following:

Table 4-3.2.1

Item	Rate
FICA	Rate established by Law
FUTA/SUTA	Rate established by Law
Medical Insurance	Actual
Holidays, Sick & Vacation benefits	Actual
Retirement benefits	Actual
Workers Compensation	Rates based on the National Council on Compensation Insurance basic rate tables adjusted by Contractor's actual experience modification factor in effect at the time of the additional work or unforeseen work.
Per Diem	Actual but not to exceed State of Florida's rate
Insurance*	Actual
*Compensation for Insurance is limited solely to General Liability Coverage and does not include any other insurance coverage (such as, but not limited to, Umbrella Coverage, Automobile Insurance, etc.).	

At the Pre-construction conference, certify to the Director the following:

- a. A listing of on-site clerical staff, supervisory personnel and their pro-rated time assigned to the contract,
- b. Actual Rate for items listed in Table 4-3.2.1,
- c. Existence of employee benefit plan for Holiday, Sick and Vacation benefits and a Retirement Plan, and,
- d. Payment of Per Diem is a company practice for instances when compensation for Per Diem is requested.

Such certification must be made by an officer or director of the Contractor with authority to bind the Contractor. Timely certification is a condition precedent to any right of the Contractor to recover compensations for such costs, and failure to timely submit the certification will constitute a full, complete, absolute and irrevocable waiver by the Contractor of any right to recover such costs. Any subsequent changes shall be certified to the Director as part of the cost proposal or seven calendar days in advance of performing such extra work.

2. Materials and Supplies: For materials accepted by the Director and used on the project, the Contractor will receive the actual cost of such materials incorporated into the work, including Contractor paid transportation charges (exclusive of equipment as hereinafter set forth). For supplies reasonably needed for performing the work, the Contractor will receive the actual cost of such supplies.

3. Equipment: 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 and as modified below. On

all projects, the Director 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:

- a. Allowable Hourly Equipment Rate = Monthly Rate/176 x Adjustment Factors x 100%.
- b. Allowable Hourly Operating Cost = Hourly Operating Cost x 100%.
- c. Allowable Rate Per Hour = Allowable Hourly Equipment Rate + Allowable Hourly Operating Cost.
- d. Standby Rate = Allowable Hourly Equipment Rate x 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 Director to standby at the project site 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 County 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 County 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.

4. Indirect Costs, Expenses, and Profit: Compensation for all indirect costs, expenses, and profit of the Contractor, including but not limited to overhead of any kind, whether jobsite, field office, division office, regional office, home office, or otherwise, is expressly limited to the greater of either (a) or (b) below:

a. Solely a mark-up of 17.5% on the payments in (1) through (3), above.

1. Bond: The Contractor will receive compensation for any premium for acquiring a bond for such additional or unforeseen work at the original Contract bond rate paid by the Contractor. No compensation for bond premium will be allowed for additional or unforeseen work paid by the County via initial contingency pay item.

2. The Contractor will be allowed a markup of 10% on the first \$50,000 and a markup of 5% on any amount over \$50,000 on any subcontract directly related to the additional or unforeseen work. Any such subcontractor mark-up will be allowed only by the prime Contractor and a first tier subcontractor, and the Contractor must elect the markup for any eligible first tier subcontractor to do so.

b. Solely the formula set forth below and only as applied solely as to such number of calendar days of entitlement that are in excess of ten cumulative calendar days as defined below.

$$D = \frac{A \times C}{B}$$

Where A = Original Contract Amount
B = Original Contract Time

C = 8%

D = Average Overhead Per Day

Cumulative Calendar Days is defined as the combined total number of calendar days granted as time extensions due to either extra work, excluding overruns to existing contract items, that extend the duration of the project or delay of a controlling work item caused solely by the County, or the combined total number of calendar days for which a claim of entitlement to a time extension due to delay of a controlling work item caused solely by the County is otherwise ultimately determined to be in favor of the Contractor.

No compensation, whatsoever, will be paid to the Contractor for any jobsite overhead and other indirect impacts when the total number of calendar days granted for time extension due to delay of a controlling work item caused solely by the County is, or the total number of calendar days for which entitlement to a time extension due to delay of a controlling work item caused solely by the County is otherwise ultimately determined in favor of the Contractor to be, equal to or less than ten calendar days and the Contractor also fully assumes all monetary risk of any and all partial or single calendar day delay periods, due to delay of a controlling work item caused solely by the County, that when combined together are equal to or less than ten calendar days and regardless of whether monetary compensation is otherwise provided for hereunder for one or more calendar days of time extension entitlement for each calendar day exceeding ten calendar days. All calculations under this provision shall exclude weather days, Holidays, and Special Events.

Further, for (a) or (b) above, in the event there are concurrent delays to one or more controlling work items, one or more being caused by the County and one or more being caused by the Contractor, the Contractor shall be entitled to a time extension for each day that a controlling work item is delayed by the County but shall have no right to nor receive any monetary compensation for any indirect costs for any days of concurrent delay.

4-3.2.2 Subcontracted Work: Compensation for the additional or unforeseen work performed by a subcontractor shall be limited solely to that provided for in 4-3.2.1 (1), (2), (3) and (4)(a). In addition, the Contractor compensation is expressly limited to the greater of the total provided in either 4-3.2.1(4)(a) or (4)(b), except that the Average Overhead Per-Day calculation is as follows:

$$D_s = \frac{A_s \times C}{B}$$

Where A_s = Original Contract Amount minus Original Subcontract amounts(s)*

B = Original Contract Time

C = 8%

D_s = Average Overhead Per-Day

* deduct Original Subcontract Amount(s) of subcontractor(s) performing the work

The subcontractor may receive compensation for any premium for acquiring a bond for the additional or unforeseen work; provided, however, that such payment for additional subcontractor bond will only be paid upon presentment to the County of clear and convincing proof

that the subcontractor has actually submitted and paid for separate bond premiums for such additional or unforeseen work in such amount and that the subcontractor was required by the Contractor to acquire a bond.

The Contractor shall require the subcontractor to submit a certification, in accordance with 4-3.2.1 (1), as part of the cost proposal and submit such to the Director. Such certification must be made by an officer or director of the subcontractor with authority to bind the subcontractor. Timely certification is a condition precedent to any right of the Contractor to recover compensation for such subcontractor costs, and failure to timely submit the certification will constitute a full, complete, absolute and irrevocable waiver by the Contractor of any right to recover such subcontractor costs.

4-3.3 No Waiver of Contract: Changes made by the Director will not be considered to waive any of the provisions of the Contract, nor may the Contractor make any claim for loss of anticipated profits because of the changes, or by reason of any variation between the approximate quantities and the quantities of work actually performed. All work shall be performed as directed by the Director and in accordance with the Contract Documents.

4-3.4 Conditions Requiring a Supplemental Agreement or Unilateral Payment: A Supplemental Agreement or Unilateral Payment will be used to clarify the Plans and Specifications of the Contract; to provide for unforeseen work, grade changes, or alterations in the Plans which could not reasonably have been contemplated or foreseen in the original Plans and Specifications; to change the limits of construction to meet field conditions; to provide a safe and functional connection to an existing pavement; to settle documented Contract claims; to make the project functionally operational in accordance with the intent of the original Contract and subsequent amendments thereto.

A Supplemental Agreement or Unilateral Payment may be used to expand the physical limits of the project only to the extent necessary to make the project functionally operational in accordance with the intent of the original Contract. The cost of any such agreement extending the physical limits of the project shall not exceed \$100,000 or 10% of the original Contract price, whichever is greater.

Except for Work included within a Field Directive Change Order, perform no work to be covered by a Supplemental Agreement or Unilateral Payment before written authorization is received from the Director. The Director's written authorization will set forth sufficient work information to allow the work to begin. The work activities, terms and conditions will be reduced to written Supplemental Agreement or Unilateral Payment form promptly thereafter. No payment will be made on a Supplemental Agreement or Unilateral Payment prior to the County's approval of the document.

4-3.5 Extra Work: Extra work authorized in writing by the Director will be paid in accordance with the formula in 4-3.2. Such payment will be the full extent of all monetary compensation entitlement due to the Contractor for such extra work. Any entitlement to a time extension due to extra work will be limited solely to that provided for in 4-3.2 for additional work.

4-3.6 Connections to Existing Pavement, Drives and Walks: Generally adhere to the limits of construction at the beginning and end of the project as detailed in the Plans. However, if the Director determines that it is necessary to extend the construction in order to make suitable connections to existing pavement, the Director will authorize such a change in writing.

For necessary connections to existing walks and drives that are not indicated in the Plans, the Director will submit direction regarding the proper connections in accordance with the Standard Plans.

4-3.7 Differing Site Conditions: 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 Contractor disturbs the conditions or performs the affected work.

Upon receipt of written notification of differing site conditions from the Contractor, the Director 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 will be made, excluding loss of anticipated profits, and the Contract will be modified in writing accordingly. The Director will notify the Contractor whether or not an adjustment of the Contract is warranted.

The Director will not allow a Contract adjustment for a differing site condition unless the Contractor has submitted the required written notice.

The Director will not allow a Contract adjustment under this clause for any effects caused to any other County or non-County projects on which the Contractor may be working.

4-3.8 Changes Affecting Utilities: The Contractor shall be responsible for identifying and assessing any potential impacts to a utility that may be caused by the changes proposed by the Contractor, and the Contractor shall at the time of making the request for a change notify the County in writing of any such potential impacts to utilities.

County approval of a Contractor proposed change 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.

4-3.9 Cost Savings Initiative Proposal:

4-3.9.1 Intent and Objective:

1. This Subarticle applies to any cost reduction proposal (hereinafter referred to as a Proposal) that the Contractor initiates and develops for the purpose of refining the Contract to increase cost effectiveness or significantly improve the quality of the end result. County Potential Proposals will be discussed as an agenda item at the pre-construction meeting. This Subarticle does not, however, apply to any such proposal unless the Contractor identifies it at the time of its submission to the County as a proposal submitted pursuant to this Subarticle.

2. The County will consider Proposals that would result in net savings to the County by providing a decrease in the cost of the Contract. Proposals must result in savings without impairing essential functions and characteristics such as safety, service, life, reliability, economy of operation, ease of maintenance, aesthetics and necessary standard design features. However, nothing herein prohibits the Contractor from submitting Proposals when the required functions and characteristics can be combined, reduced or eliminated because they are nonessential or excessive. The County will not recognize the Contractor's correction of plan errors that result in a cost reduction, as a Proposal.

3. The County reserves the right to reject at its discretion any Proposal submitted that proposes a change in the design of the pavement system or that would require additional right-of-way. Pending the County's execution of a formal supplemental agreement

implementing an approved Proposal, the Contractor shall remain obligated to perform the work in accordance with the terms of the existing Contract. The County may grant time extensions to allow for the time required to develop and review a Proposal.

4. For potential Proposals not discussed at the Cost Savings Initiative Workshop, a mandatory concept meeting will be held for the Contractor and County to discuss the potential Proposal prior to development of the Proposal.

4-3.9.2 Subcontractors: The County encourages the Contractor to include the provisions of this Subarticle in Contracts with subcontractors and to encourage submission of Proposals from subcontractors. However, it is not mandatory to submit Proposals to the County or to accept or transmit subcontractor proposed Proposals to the County.

4-3.9.3 Data Requirements: As a minimum, submit the following information with each Proposal:

1. a description of the difference between the existing Contract requirement, including any time extension request, and the proposed change, and the comparative advantages and disadvantages.

2. separate detailed cost estimates for both the existing Contract requirement and the proposed change. Break down the cost estimates by pay item numbers indicating quantity increases or decreases and deleted pay items. Identify additional proposed work not covered by pay items within the Contract, by using pay item numbers in the Basis of Estimates Manual. In preparing the estimates, include overhead, profit, and bond within pay items in the Contract. Separate pay item(s) for the cost of overhead, profit, and bond will not be allowed.

3. an itemization of the changes, deletions or additions to Plan details, plan sheets, Standard Plans and Specifications that are required to implement the Proposal if the County adopts it. Submit preliminary plan drawings sufficient to describe the proposed changes.

4. engineering or other analysis in sufficient detail to identify and describe specific features of the Contract that must be changed if the County accepts the Proposal with a proposal as to how these changes can be accomplished and an assessment of their effect on other project elements. The County may require that engineering analyses be performed by a prequalified consultant in the applicable class of work. Support all design changes that result from the Proposal with drawings and computations signed and sealed by the Contractor's Engineer of Record. Written documentation or drawings will be submitted clearly delineating the responsibility of the Contractor's Engineer of Record.

5. the date by which the County must approve the Proposal to obtain the total estimated cost reduction during the remainder of the Contract, noting any effect on the Contract completion time or delivery schedule.

6. a revised project schedule that would be followed upon approval of the Proposal. This schedule would include submittal dates and review time for the County and Peer reviews.

4-3.9.4 Processing Procedures: Submit Proposals to the Director or his duly authorized representative. The County will process Proposals expeditiously; however, the County is not liable for any delay in acting upon a Proposal submitted pursuant to this Subarticle. The Contractor may withdraw, in whole or in part, a Proposal not accepted by the County within the period specified in the Proposal. The County is not liable for any Proposal development cost in the case where the County rejects or the Contractor withdraws a Proposal.

The Director is the sole judge of the acceptability of a Proposal and of the estimated net savings in construction costs from the adoption of all or any part of such proposal. In

determining the estimated net savings, the County reserves the right to disregard the Contract bid prices if, in the judgment of the Director, such prices do not represent a fair measure of the value of work to be performed or to be deleted.

Prior to approval, the Director may modify a Proposal, with the concurrence of the Contractor, to make it acceptable. If any modification increases or decreases the net savings resulting from the Proposal, the County will determine the Contractor's fair share upon the basis of the Proposal as modified and upon the final quantities. The County will compute the net savings by subtracting the revised total cost of all bid items affected by the Proposal from the total cost of the same bid items as represented in the original Contract.

Prior to approval of the Proposal that initiates the supplemental agreement, submit acceptable Contract-quality plan sheets revised to show all details consistent with the Proposal design.

4-3.9.5 Computations for Change in Contract Cost of Performance: If the Proposal is adopted, the Contractor's share of the net savings as defined hereinafter represents full compensation to the Contractor for the Proposal.

The County will not include its costs to process and implement a Proposal in the estimate. However, the County reserves the right, where it deems such action appropriate, to require the Contractor to pay the County's cost of investigating and implementing a Proposal as a condition of considering such proposal. When the County imposes such a condition, the Contractor shall accept this condition in writing, authorizing the County to deduct amounts payable to the County from any monies due or that may become due to the Contractor under the Contract.

4-3.9.6 Conditions of Acceptance for Major Design Modifications of Category 2 Bridges: A Proposal that proposes major design modifications of a category 2 bridge, as determined by the Director, shall have the following conditions of acceptance:

All bridge Plans relating to the Proposal shall undergo an independent peer review conducted by a single independent engineering firm referred to for the purposes of this article as the Independent Review Engineer who is not the originator of the Proposal design, and is pre-qualified by the County in accordance with Rule 14-75, Florida Administrative Code. The independent peer review is intended to be a comprehensive, thorough verification of the original work, giving assurance that the design is in compliance with all County requirements. The Independent Review Engineer's comments, along with the resolution of each comment, shall be submitted to the County. The Independent Review Engineer shall sign and seal the submittal cover letter stating that all comments have been adequately addressed and the design is in compliance with the County requirements. If there are any unresolved comments the Independent Review Engineer shall specifically list all unresolved issues in the signed and sealed cover letter.

The Contractor shall designate a primary engineer responsible for the Proposal design and as such will be designated as the Contractor's Engineer of Record for the Proposal design. The County reserves the right to require the Contractor's Engineer of Record to assume responsibility for design of the entire structure.

New designs and independent peer reviews shall be in compliance with all applicable County, FHWA and AASHTO criteria requirements including bridge load ratings.

4-3.9.7 Sharing Arrangements: If the County approves a Proposal, the Contractor shall receive 50% of the net reduction in the cost of performance of the Contract as determined by the final negotiated agreement between the Contractor and the County. The net reduction will be determined by subtracting from the savings of the construction costs the reasonable documented engineering costs incurred by the contractor to design and develop a Proposal. The reasonable

documented engineering costs will be paid by the County. Engineering costs will be based on the consultant's certified invoice and may include the costs of the Independent Review Engineer in 4-3.9.6. The total engineering costs to be subtracted from the savings to determine the net reduction will be limited to 25% of the construction savings and shall not include any markup by the Contractor or the costs for engineering services performed by the Contractor.

4-3.9.8 Notice of Intellectual Property Interests and County's Future Rights to a Proposal:

4-3.9.8.1 Notice of Intellectual Property Interests: The Contractor's Proposal submittal shall identify with specificity any and all forms of intellectual property rights that either the Contractor or any officer, shareholder, employee, consultant, or affiliate, of the Contractor, or any other entity who contributed in any measure to the substance of the Contractor's Proposal development, have or may have that are in whole or in part implicated in the Proposal. Such required intellectual property rights notice includes, but is not limited to, disclosure of any issued patents, copyrights, or licenses; pending patent, copyright or license applications; and any intellectual property rights that though not yet issued, applied for or intended to be pursued, could nevertheless otherwise be subsequently the subject of patent, copyright or license protection by the Contractor or others in the future. This notice requirement does not extend to intellectual property rights as to stand-alone or integral components of the Proposal that are already on FDOT's Approved Product List (APL) or Standard Plans, or are otherwise generally known in the industry as being subject to patent or copyright protection.

4-3.9.8.2 County's Future Rights to a Proposal: Notwithstanding 7-3 nor any other provision of the Standard Specifications, upon acceptance of a Proposal, the Contractor hereby grants to the County and its contractors (such grant being expressly limited solely to any and all existing or future County construction projects and any other County projects that are partially or wholly funded by or for the County) a royalty-free and perpetual license under all forms of intellectual property rights to manufacture, to use, to design, to construct, to disclose, to reproduce, to prepare and fully utilize derivative works, to distribute, display and publish, in whole or in part, and to permit others to do any of the above, and to otherwise in any manner and for any purpose whatsoever do anything reasonably necessary to fully utilize any and all aspects of such Proposal on any and all existing and future construction projects and any other County projects.

Contractor shall hold harmless, indemnify and defend the County and its contractors and others in privity therewith from and against any and all claims, liabilities, other obligations or losses, and reasonable expenses related thereto (including reasonable attorneys' fees), which are incurred or are suffered by any breach of the foregoing grants, and regardless of whether such intellectual property rights were or were not disclosed by the Contractor pursuant to 4-3.9.8.1, unless the County has by express written exception in the Proposal acceptance process specifically released the Contractor from such obligation to hold harmless, indemnify and defend as to one or more disclosed intellectual property rights.

4-4 Unforeseeable Work.

When the County 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 County finds that such work is essential to the satisfactory completion of the Contract within its intended scope, the County will make an adjustment to the Contract. The Director will determine the basis of payment for such an adjustment in a fair and equitable amount.

4-5 Rights in and Use of Materials Found on the Site of the Work.

4-5.1 Ownership and Disposal of Existing Materials: Take ownership and dispose of all materials that are not designated as the property of other parties, in both roadway and structures, found on the right-of-way, and all material in structures designated for removal. Such materials do not include earth or other excavated material required for the construction of the project. During construction, the Contractor may use materials from existing structures that are required to be removed and that are designated to remain the property of the County. Do not cut or otherwise damage such material during removal unless the Director gives permission to do so. Store material in an accessible location as the Director directs. The County is not responsible for the quality or quantity of any material salvaged.

4-5.2 Ornamental Trees and Shrubs: Take ownership of all ornamental trees or shrubs existing in the right-of-way that are required to be removed for the construction operations and which are not specifically designated in the Plans to be reset, or to be removed by others prior to the construction operations.

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

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

Shape and dress areas adjacent to the project right-of-way that were used as plant sites, materials storage areas or equipment yards when they are no longer needed for such purposes. Restore these areas in accordance with 7-11.1 and 7-11.2. Grass these areas when the Director directs.

SECTION 5 CONTROL OF THE WORK

5-1 Plans and Working Drawings.

5-1.1 Contract Documents: Have available the Contract Documents on the worksite at all times.

5-1.2 County Plans: Plans consist of general drawings showing such details as are necessary to give a comprehensive idea of the construction contemplated. In general, roadway plans will show alignment, profile grades, typical cross-sections and general cross-sections. In general, structure plans will show in detail all dimensions of the work contemplated. When the structure plans do not show the dimensions in detail, they will show general features and such details as are necessary to give a comprehensive idea of the structure.

Grades shown are finished grades, and B.M. Datum is North American Vertical Datum 1988 (NAVD-1988), National Geodetic Vertical Datum of 1929 (NGVD-1929), or other datum as noted in the Plans.

5-1.3 Alterations in Plans: The County will issue, in writing, all authorized alterations affecting the requirements and information given on the approved Plans.

5-1.4 Shop Drawings:

5-1.4.1. Definitions:

1. Shop Drawings: All working, shop and erection drawings, associated trade literature, calculations, schedules, manuals and similar documents submitted by the Contractor to define some portion of the project work. The type of work includes both permanent and temporary works as appropriate to the project.

2. Permanent Works: All the permanent structures and parts thereof required of the completed Contract.

3. Temporary Works: Any temporary construction work necessary for the construction of the permanent works. This includes but is not limited to bracing, falsework, formwork, scaffolding, shoring, temporary earthworks, sheeting, cofferdams, and special erection equipment.

4. Construction Affecting Public Safety: Construction that may jeopardize public safety such as structures spanning functioning vehicular roadways, pedestrian walkways, railroads, navigation channels of navigable waterways and walls or other structure foundations located in embankments immediately adjacent to functioning roadways. It does not apply to those areas of the site under the Contractor's control and outside the limits of normal public access.

5. Major and Unusual Structures: Bridges of complex geometry and/or complex design. Generally, this includes the following types of structures:

- a. Bridges with an individual span longer than 300 feet.
- b. Structurally continuous superstructures with spans over 150 feet.
- c. Steel box and plate girder bridges.
- d. Steel truss bridges.
- e. Concrete segmental and longitudinally post-tensioned continuous girder bridges.
- f. Cable stayed or suspension bridges.
- g. Arch bridges.
- h. Tunnels.

i. Movable bridges (specifically electrical and mechanical components).

j. Rehabilitation, widening, or lengthening of any of the above.

6. Special Erection Equipment includes launching gantries, beam and winch equipment, form travelers, stability towers, strong-backs, erection trusses, launching noses or similar items made purposely for construction of the structure. It does not apply to commonly available proprietary construction equipment such as cranes.

7. Falsework includes any temporary construction work used to support the permanent structure until it becomes self-supporting. Falsework includes steel or timber beams, girders, columns, piles and foundations, and any proprietary equipment including modular shoring frames, post shores, and adjustable horizontal shoring.

8. Formwork includes any structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Formwork comprises common materials such as wood or metal sheets, battens, soldiers and walers, ties, proprietary forming systems such as stay-in-place metal forms, and proprietary supporting bolts, hangers and brackets. Formwork may be either permanent formwork requiring a shop drawing submittal such as stay-in-place metal or concrete forms, or may be temporary formwork which requires certification by the Specialty Engineer for Construction Affecting Public Safety and for Major and Unusual Structures.

9. Scaffolding is an elevated work platform used to support workmen, materials and equipment, but not intended to support the structure.

10. Shoring is a component of falsework such as horizontal, vertical or inclined support members. In this Section, this term is interchangeable with falsework.

11. Bracing is a temporary structural member(s) placed between beams, girders, piles columns, etc. to provide stability during construction activities.

12. Contractor Originated Designs: Items which the Contract Documents require the Contractor to design, detail and incorporate into the permanent works.

5-1.4.2 Work Items Requiring Shop Drawings: In general, the County requires shop drawings for items of work not fully detailed in the Plans which require additional drawings and coordination prior to constructing the item, including but not limited to:

1. Bridge components not fully detailed in the Plans, i.e. segments, steel girder details, post-tensioning details, handrails, etc.

2. Retaining Wall Systems

3. Precast Box Culverts

4. Non-standard structures and components for drainage, lighting, signalization and signing

5. Building structures

6. Non-standard crash cushions and other nonstructural items

7. Design and structural details furnished by the Contractor in compliance with the Contract

8. Temporary Works affecting public safety

Additional clarification for certain types of bridge structures is provided in 5-1.4.7. Other provisions of the Contract Documents may waive the requirement for submittals for certain items; i.e., items constructed from standard drawings or those complying with alternate details for prestressed members under Section 450. Review the Contract Documents to determine the submittals required.

5-1.4.3 Schedule of Submittals: Prepare and submit a schedule of submittals that identifies the work for which shop drawings apply. For each planned submittal, define the type, and approximate number of drawings or other documents that are included and the planned submittal date, considering the processing requirements herein. Submit the schedule of submittals to the CEI Consultant within 60 days of the start of the Contract, and prior to the submission of any shop drawings.

Coordinate subsequent submittals with construction schedules to allow sufficient time for review, approval, and re-submittal as necessary.

5-1.4.4 Style, Numbering, and Material of Submittals:

5-1.4.4.1 Drawings: Submit all shop drawings that are necessary to complete the structure in compliance with the design shown in the Plans. Prepare all shop drawings using the same units of measure as those used in the Contract Plans. Consecutively number each sheet in the submittal series, and indicate the total number in the series (i.e., 1 of 12, 2 of 12 . . . 12 of 12). Include on each sheet the following items as a minimum requirement: the complete Project Number, Financial Project Identification Number (if applicable), Bridge Number(s), drawing title and number, a title block showing the names of the fabricator or producer and the Contractor for which the work is being done, the initials of the person(s) responsible for the drawing, the date on which the drawing was prepared, the location of the item(s) within the project, the Contractor's approval stamp with date and initials, and, when applicable, the documents shall be signed and sealed by the Specialty Engineer or Contractor's Engineer of Record, as appropriate. A re-submittal will be requested when any of the required information is not included.

Shop drawings shall be submitted in Portable Document Format (PDF) files, formatted on 11 inch by 17 inch sheets.

5-1.4.4.2 Other Documents: Submit PDF files of other documents such as trade literature, catalogue information, calculations, and manuals formatted on sheets no larger than 11 inch by 17 inches. Clearly label and number each sheet in the submittal to indicate the total number of sheets in the series (i.e., 1 of 12, 2 of 12 . . . 12 of 12).

Prepare all documents using the same units of measure as the Contract Plans and include a Table of Contents cover sheet. List on the cover sheet the total number of pages and appendices, and include the complete Project Number, Financial Project Identification Number (if applicable), a title referencing the submittal item(s), the name of the firm and person(s) responsible for the preparation of the document, the Contractor's approval stamp with date and initials, and, when applicable, the documents shall be signed and sealed by the Specialty Engineer or Contractor's Engineer of Record, as appropriate.

Submit appropriately prepared and checked calculations and manuals that clearly outline the design criteria. Include on the internal sheets the complete Financial Project Identification Number and the initials of the person(s) responsible for preparing and checking the document.

Clearly label trade literature and catalogue information on the front cover with the title, Financial Project Identification Number, date and name of the firm and person(s) responsible for that document.

5-1.4.5 Submittal Paths:

5-1.4.5.1 General: Shop drawings are not required for prequalified items. For non-prequalified items, details of the submittal path and protocol to be followed will be established by the CEI Consultant and communicated at the preconstruction conference. Shop

drawing review will be performed by the Engineer of Record for the project feature associated with each submittal and communicated through the CEI Consultant. Shop drawing submittals shall include other information such as catalog data, procedure manuals, fabrication/welding procedures, and maintenance and operating procedures when required by the work. Submit material certifications and material tests to the CEI Consultant. The Contractor is responsible for checking and verifying any necessary field dimensions required in the development of shop drawings.

5-1.4.5.2 Building Structures: Submit working, shop and erection drawings, and all correspondence related to building structures to the CEI Consultant for review and approval.

5-1.4.5.3 Contractor-Originated Design: Submit shop drawings and applicable calculations to the CEI Consultant for review. The shop drawings and applicable calculations must be signed and sealed by the Specialty Engineer or the Contractor's Engineer of Record. Submit in accordance with the requirements of 5-1.4.5.1 through 5-1.4.5.3, as appropriate.

5-1.4.5.4 Temporary Works: For Construction Affecting Public Safety, submit to the CEI Consultant shop drawings and the applicable calculations for the design of special erection equipment, bracing, falsework, scaffolding, etc. The shop drawings and applicable calculations must be signed and sealed by the Specialty Engineer. Submit in accordance with the requirements of 5-1.4.5.1 through 5-1.4.5.3, as appropriate.

5-1.4.5.5 Falsework Founded on Shallow Foundations: When vertical displacement limits are provided in the Plans for falsework founded on shallow foundations such as spread footings and mats, submit to the CEI Consultant shop drawings and applicable calculations of the falsework system including subsurface conditions and settlement estimates. The shop drawings and applicable calculations must be signed and sealed by the Specialty Engineer. Submit in accordance with the requirements of 5-1.4.5.1 through 5-1.4.5.3, as appropriate.

5-1.4.5.6 Formwork and Scaffolding: The Contractor is solely responsible for the safe installation and use of all formwork and scaffolding. The County does not require any formwork or scaffolding submittals unless such work would be classified as Construction Affecting Public Safety. For formwork, scaffolding, or other temporary works affecting public safety; develop the required designs in accordance with the AASHTO Guide Design Specifications for Bridge Temporary Works, the AASHTO Construction Handbook for Bridge Temporary Works, and Chapter 11 of the Structures Design Guidelines (SDG) using wind loads specified in the SDG.

5-1.4.5.7 Beam and Girder Temporary Bracing: The Contractor is solely responsible for ensuring stability of beams and girders during all handling, storage, shipping and erection. Adequately brace beams and girders to resist wind, weight of forms and other temporary loads, especially those eccentric to the vertical axis of the products, considering actual beam geometry and support conditions during all stages of erection and deck construction. At a minimum, provide temporary bracing at each end of each beam or girder. Develop the required bracing designs in accordance with the AASHTO LRFD Bridge Design Specifications (LRFD) and Chapter 11 of the SDG using wind loads specified in the SDG. For information not included in the SDG or LRFD, refer to the AASHTO Guide Design Specifications for Bridge Temporary Works and the AASHTO Construction Handbook for Bridge Temporary Works.

For Construction Affecting Public Safety, when temporary bracing requirements are shown in the Plans, submit plans and calculations signed and sealed by a Specialty Engineer for the design of temporary bracing members and connections based on the forces shown in the Plans. In addition, submit a written certification that construction loads do not exceed the assumed loads shown in the Plans.

For Construction Affecting Public Safety, when temporary bracing requirements are not shown in the Plans or an alternate temporary bracing system is proposed, submit plans and calculations signed and sealed by a Specialty Engineer including the stability analysis and design of temporary bracing members and connections.

5-1.4.5.8 Erection Plan: Submit, for the Director's review, an Erection Plan that meets the specific requirements of Sections 450, 452 and 460 and this section. Refer to Standard Plans, Index-102- 600 for construction activities not permitted over traffic.

5-1.4.5.9 Other Miscellaneous Design and Structural Details Furnished by the Contractor in Compliance with the Contract: Submit to the CEI Consultant shop drawings and the applicable calculations. The shop drawings and applicable calculations must be signed and sealed by the Specialty Engineer. Submit in accordance with the requirements of 5-1.4.5.1 through 5-1.4.5.3, as appropriate.

5-1.4.5.10 Project Shop Drawing Package: Upon completion of the work, but prior to authorization of final payment, the Contractor shall furnish the Director one complete, indexed and cataloged PDF file containing all of the Contractors, Subcontractors, and manufacturers shop drawings and catalog data as finally checked and reviewed by the Director with all modifications accepted by the Director subsequent thereto, showing the work as actually completed.

5-1.4.6 Processing of Shop Drawings:

5-1.4.6.1 Contractor Responsibility for Accuracy and Coordination of Shop Drawings: Coordinate, schedule, and control all submittals, with a regard for the required priority, including those of the various subcontractors, suppliers, and engineers, to provide for an orderly and balanced distribution of the work.

Coordinate, review, date, stamp, approve and sign all shop drawings prepared by the Contractor or agents (subcontractor, fabricator, supplier, etc.) prior to submitting them to the CEI Consultant. Submittal of the drawings confirms verification of the work requirements, units of measurement, field measurements, construction criteria, sequence of assembly and erection, access and clearances, catalog numbers, and other similar data. Indicate on each series of drawings the specification section and sheet or drawing number of the Contract Plans to which the submission applies. Indicate on the shop drawings all deviations from the Contract drawings and itemize all deviations in the letter of transmittal. Likewise, whenever a submittal does not deviate from the Contract Plans, clearly state so in the submittal.

Schedule the submission of shop drawings to allow for a 45 day review period. The review period commences upon the CEI Consultant's receipt of the valid submittal or valid re-submittal and terminates upon the transmittal of the submittal back to the Contractor. A valid submittal includes all the minimum requirements outlined in 5-1.4.4.

Submit shop drawings to facilitate expeditious review. The Contractor is discouraged from transmitting voluminous submittals of shop drawings at one time. For submittals transmitted in this manner, allow for the additional review time that may result.

Only shop drawings distributed with the approval stamps are valid and all work that the Contractor performs in advance of approval will be at the Contractor's risk.

5-1.4.6.2 Scope of Review by Engineer: The Engineer of Record's review of the shop drawings is for conformity to the requirements of the Contract Documents and to the intent of the design. The Engineer of Record's review of shop drawings which include means, methods, techniques, sequences, and construction procedures are limited to the effects on the permanent works. The Engineer of Record's review of submittals which include means, methods, techniques, sequences, and construction procedures does not include an in-depth check for the ability to perform the work in a safe or efficient manner. Review by the Engineer of Record does not relieve the Contractor of responsibility for dimensional accuracy to ensure field fit and for conformity of the various components and details.

5-1.4.6.3 Special Review by Engineer of Shop Drawings for Construction Affecting Public Safety: For Construction Affecting Public Safety, the Engineer of Record, or other Engineer as the County appoints for this purpose, will make an independent review of all relevant shop drawings and similar documents. Do not proceed with construction of the permanent works until receiving the Engineer of Record's written approval. The review of these shop drawings is for overall structural adequacy of the item to support the imposed loads and does not include a check for economy, efficiency or ease of construction.

5-1.4.7 Other Requirements for Shop Drawings for Bridges:

5-1.4.7.1 Shop Drawings for Structural Steel and Miscellaneous Metals: Submit shop drawings for structural steel and miscellaneous metals. Shop drawings shall consist of working, shop, and erection drawings, welding procedures, and other working plans, showing details, dimensions, sizes of material, and other information necessary for the complete fabrication and erection of the metal work.

5-1.4.7.2 Shop Drawings for Concrete Structures: Submit shop drawings for concrete components that are not cast-in-place and are not otherwise exempted from submittal requirements. Also, submit shop drawings for all details that are required for the effective prosecution of the concrete work and are not included in the Contract Documents such as: special erection equipment, masonry layout diagrams, and diagrams for bending reinforcing steel, in addition to any details required for concrete components for the permanent work.

5-1.4.7.3 Shop Drawings for Major and Unusual Structures: In addition to any other requirements, within 60 days from the Notice to Proceed, submit information to the Director outlining the integration of the Major and Unusual Structure into the overall approach to the project. Where applicable to the project, include, but do not limit this information to:

1. The overall construction program for the duration of the Contract. Clearly show the Milestone dates. (For example, the need to open a structure by a certain time for traffic operations.)
2. The overall construction sequence. The order in which individual structures are to be built, the sequence in which individual spans of girders or cantilevers are erected, and the sequence in which spans are to be made continuous.
3. The general location of any physical obstacles to construction that might impose restraints or otherwise affect the construction, and an outline of how to deal with such obstacles while building the structure(s). (For example, obstacles might include road, rail and waterway clearances, temporary diversions, transmission lines, utilities, property, and the Contractor's own temporary works, such as haul roads, cofferdams, plant clearances and the like.)

4. The approximate location of any special lifting equipment in relation to the structure, including clearances required for the operation of the equipment. (For example, crane positions, operating radii and the like.)

5. The approximate location of any temporary falsework, and the conceptual outline of any special erection equipment. Provide the precise locations and details of attachments, fixing devices, loads, etc. in later detailed submittals.

6. An outline of the handling, transportation, and storage of fabricated components, such as girders or concrete segments. Provide the precise details in later detailed submittals.

7. Any other information pertinent to the proposed scheme or intended approach.

Clearly and concisely present the above information on as few drawings as possible in order to provide an overall, integrated summary of the intended approach to the project. The County will use these drawings for information, review planning, and to assess the Contractor's approach in relation to the intent of the original design. Submittal to and receipt by the Director does not constitute any County acceptance or approval of the proposals shown thereon. Include the details of such proposals on subsequent detailed shop drawing submittals. Submit timely revisions and re-submittals for all variations from these overall scheme proposals.

5-1.4.8 Modifications for Construction: Where the Director allows the Contractor to make modifications to the permanent works for the purposes of expediting the Contractor's chosen construction methods, the Contractor shall submit proposals to the Engineer of Record for review and approval prior to modifying the works. Submit proposals for minor modifications under the shop drawing process. Indicate on all drawings the deviations from the Contract Documents and itemize all deviations in the letter of transmittal. The County will require additional submittals and/or submittal under a Cost Savings Initiative Proposal for major modifications.

Minor modifications are those items that, in the opinion of the Director, do not significantly affect the quantity of measured work, or the integrity or maintainability of the structure or its components. (For example, adjusting concrete dimensions, substituting steel plate sizes, changing reinforcing bar size and spacing, etc., all within the acceptable limits of the design.)

Major modifications are any modifications that, in the opinion of the Director, significantly affect the quantity of measured work, or the integrity or maintainability of the structure or its' components. (For example, substituting alternative beam sizes and spacings, changing material strength or type, and the like.). Submit signed and sealed revised sheets to the Director for any such revisions to the Contract Plans prior to submitting shop drawings.

The Director's decision on the delineation between a minor and a major modification and the disposition of a proposal is final.

5-1.4.9 Cost of Shop Drawings: Include the cost of shop and working drawings submittal in the Contract prices for the work requiring the shop and working drawings. The County will not pay the Contractor additional compensation for such drawings.

5-1.5 Certifications:

5-1.5.1 Special Erection Equipment: Prior to its use, ensure that the Specialty Engineer personally inspects the special erection equipment and submits a written certification to the Director that the equipment has been fabricated in accordance with the submitted drawings and calculations. In addition, after assembly, ensure that the Specialty Engineer observes the

equipment in use and submits a written certification to the Director that such equipment is being used as intended and in accordance with the submitted drawings and calculations. In each case, the Specialty Engineer must sign and seal the letter of certification.

5-1.5.2 Falsework and Shoring Requiring Shop Drawings: After its erection or installation but prior to the application of any superimposed load, ensure that a Specialty Engineer or a designee inspects the falsework and certifies to the Director in writing that the falsework has been constructed in accordance with the materials and details shown on the submitted drawings and calculations. The letter of certification must be signed and sealed by the Specialty Engineer. Where so directed in the shop drawings, ensure all welds are performed by welders qualified under AWS D1.5 for the type of weld being performed.

5-1.5.3 Temporary Formwork: For Construction Affecting Public Safety and for Major and Unusual Structures, prior to the placement of any concrete, ensure that a Specialty Engineer or a designee inspects the formwork and submits a written certification to the Director that the formwork has been constructed to safely withstand the superimposed loads to which it will be subjected. The Specialty Engineer must sign and seal the letter of certification.

5-1.5.4 Erection: For Construction Affecting Public Safety, submit an erection plan signed and sealed by the Specialty Engineer to the Director at least four weeks prior to erection commencing. Include, as part of this submittal, signed and sealed calculations and details for any falsework, bracing or other connection supporting the structural elements shown in the erection plan. Unless otherwise specified in the Plans, erection plans are not required for simple span precast prestressed concrete girder bridges with spans of 170 feet or less.

At least two weeks prior to beginning erection, conduct a Pre-erection meeting to review details of the plan with the Specialty Engineer that signed and sealed the plan, and any Specialty Engineers that may inspect the work and the Director.

After erection of the elements, but prior to opening of the facility below the structure, ensure that a Specialty Engineer or a designee has inspected the erected member. Ensure that the Specialty Engineer has submitted a written certification to the Director that the structure has been erected in accordance with the signed and sealed erection plan.

For structures without temporary supports but with temporary girder bracing systems, perform, as a minimum, weekly inspections of the bracing until all the diaphragms and cross frames are in place. For structures with temporary supports, perform daily inspections until the temporary supports are no longer needed as indicated in the erection plans. Submit written documentation of the inspections to the Director within 24 hours of the inspection.

5-1.6 Corrections for Construction Errors: For work that the Contractor constructs incorrectly or does not meet the requirements of the Contract Documents, the Contractor has the prerogative to submit an acceptance proposal to the Director for review and disposition. The acceptance proposal shall describe the error or defect and either describe remedial action for its correction or propose a method for its acceptance. In either case, the acceptance proposal shall address structural integrity, aesthetics, maintainability, and the effect on Contract Time. The County will judge any such proposal for its effect on these criteria and also for its effect on Contract Administration.

When the Director judges that a proposal infringes on the structural integrity or maintainability of the structure, the Contractor's Engineer of Record will perform a technical assessment and submit it to the Director for approval. Do not take any corrective action without the Director's written approval.

Carry out all approved corrective construction measures at no expense to the County.

Notwithstanding any disposition of the compensation aspects of the defective work, the Director's decision on the technical merits of a proposal is final.

5-2 Coordination of Contract Documents.

These Specifications, the Plans, Special Provisions, and all supplementary documents are integral parts of the Contract Documents; a requirement occurring in one is as binding as though occurring in all. All parts of the Contract Documents are complementary and describe and provide for a complete work. In addition to the work and materials specified in the Specifications as being included in any specific pay item, include in such pay items additional, incidental work, not specifically mentioned, when so shown in the Plans, or if indicated, or obvious and apparent, as being necessary for the proper completion of the work under such pay item and not stipulated as being covered under other pay items.

In cases of discrepancy, the governing order of the documents is as follows:

1. Special Provisions.
2. Technical Special Provisions.
3. Plans.
4. Standard Plans.
5. Developmental Specifications.
6. Supplemental Specifications.
7. Standard Specifications.

Computed dimensions govern over scaled dimensions.

5-3 Conformity of Work with Contract Documents.

Perform all work and furnish all materials in reasonably close conformity with the lines, grades, cross-sections, dimensions, and material requirements, including tolerances, as specified in the Contract Documents.

In the event that the Director finds that the Contractor has used material or produced a finished product that is not in reasonably close conformity with the Contract Documents, but that the Contractor has produced reasonably acceptable work, the Director will determine if the County will accept the work in place. In this event, the Director will document the basis of acceptance by Contract modification, which provides for an appropriate reduction in the Contract price for such work or materials included in the accepted work as deemed necessary to conform to the determination based on engineering judgment.

In the event that the Director finds that the Contractor has used material or produced a finished product that is not in reasonably close conformity with the Contract Documents, and that the Contractor has produced an inferior or unsatisfactory product, the Contractor shall remove and replace or otherwise correct the work or materials at no expense to the County.

For base and surface courses, the County will allow the finished grade to vary as much as 0.1 foot from the grade shown in the Plans, provided that the Contractor's work meets all templates and straightedge requirements and contains suitable transitions.

5-4 Errors or Omissions in Contract Documents.

Do not take advantage of any apparent error or omission discovered in the Contract Documents, but immediately notify the Director in writing of such discovery. The Director will

then make such corrections and interpretations as necessary to reflect the actual spirit and intent of the Contract Documents.

5-5 Authority of the Director.

Perform all work to the satisfaction of the Director.

The Director will decide all questions, difficulties, and disputes, of whatever nature, that may arise relative to the interpretation of the Plans, construction, prosecution, and fulfillment of the Contract, and as to the character, quality, amount, and value of any work done, and materials furnished, under or by reason of the Contract.

5-6 Authority and Duties of Director's Assistants.

The Director may appoint such assistants and representatives as desired. These assistants and representatives are authorized to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the manufacture, preparation, or fabrication of the materials to be used. Such assistants and representatives are not authorized to revoke, alter, or waive any requirement of these Specifications. Rather, they are authorized to call to the attention of the Contractor any failure of the work or materials to meet the Contract Documents, and have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by the Director. The Director will immediately submit written notification to the Contractor of any such suspension of the work, stating in detail the reasons for the suspension. The presence of the inspector or other assistant in no way lessens the responsibility of the Contractor.

5-7 Engineering and Layout.

5-7.1 Control Points Furnished by the County: The Director will provide control points at various locations along the project alignment (Begin Project, End Project, PIs, PTs, etc.) and bench marks along the line of the project to facilitate the proper layout of the work. Control points and bench marks provided by the engineer, if any, will be indicated in the Plans. Preserve all control points and bench marks that the County furnishes. Any points carelessly or willfully disturbed or destroyed shall be reset at the sole expense of the Contractor.

As an exception to the above, for projects where the Plans do not show a centerline or other survey control line for construction of the work (e.g., resurfacing, safety modifications, etc.) the Director may provide only points marking the beginning and ending of the project, and all exceptions.

Prior to commencing the work, the Contractor shall perform a quality control check of all horizontal and vertical control points provided by the County and carefully compare all lines depicted in the plans with existing lines and levels, and shall call any discrepancies to the attention of the Director for resolution. Upon resolution of any discrepancies, the Contractor shall submit a letter to the County accepting the control points and bench marks for use. In any event, the Contractor shall be responsible for the accuracy of the Work and shall make good any work performed in error, at no cost to the County. All construction surveying and layout work to be provided herein shall be coordinated with and subject to the approval of the Director.

5-7.1.1 Third Party Survey Monumentation: The Contractor is responsible for the protection and preservation of any third party survey monumentation (National Geodetic Survey points, property corners, etc.) located within the project limits. Any points carelessly or willfully disturbed or destroyed shall be reset at the sole expense of the Contractor. Any third party survey monumentation designated by the Director to be removed and re-established will be paid for at

the unit prices set forth in the Contract, or if no such item exists in accordance with Section 4-3.2.1.

5-7.2 Furnishing of Stake Materials: Furnish all stakes, templates, and other materials necessary for establishing and maintaining the lines and grades necessary for control and construction of the work.

5-7.3 Layout of Work: Utilizing the control points and bench marks furnished by the County and accepted by the Contractor in accordance with 5-7.1, establish all horizontal and vertical controls necessary to construct the work in conformity to the Contract Documents. Perform all calculations required, and set all stakes needed such as grade stakes, offset stakes, reference point stakes, slope stakes, and other reference marks or points necessary to provide lines and grades for construction of all roadway, bridge, and miscellaneous items.

When performing utility construction as part of the project, establish all horizontal and vertical controls necessary to carry out such work.

5-7.4 Specific Staking Requirements: When performing new base construction as part of the project, set stakes to establish lines and grades for subgrade, base, curb, and related items at intervals along the line of the work. If Automated Machine Guidance is utilized, set stakes as needed. If Automated Machine Guidance is not utilized, set stakes no greater than 50 feet on tangents and 25 feet on curves. Set grade stakes at locations that the Director directs to facilitate checking of subgrade, base, and pavement elevations in crossovers, intersections, and irregular shaped areas.

For bridge construction stakes and other control, set references at sufficiently frequent intervals to ensure construction of all components of a structure in accordance with the lines and grades shown in the Plans.

For projects where the Plans do not show a centerline or other survey control line for construction of the work (resurfacing, safety modifications, etc.), provide only such stakes as necessary for horizontal and vertical control of work items.

For resurfacing and resurfacing-widening type projects, establish horizontal controls adequate to ensure that the asphalt mix added matches with the existing pavement. In tangent sections, set horizontal control points at 100 foot intervals by an instrument survey. In curve sections, set horizontal control points at 25 foot intervals by locating and referencing the centerline of the existing pavement. Alternate intervals may be used on resurfacing projects with prior written approval of the Director.

Establish by an instrument survey, and mark on the surface of the finished pavement at 25 foot intervals, the points necessary for striping of the finished roadway. As an exception, for resurfacing and resurfacing/widening projects, establish these points in the same manner as used for horizontal control of paving operations. Mark the pavement with white paint. If performing striping, the Director may approve an alternate method for layout of striping provided that the Contractor achieves an alignment equal to or better than the alignment that would be achieved using an instrument survey.

For projects that include temporary or permanent striping of "no passing zones", provide the location and length of these zones as shown in the Plans, except projects where the vertical or horizontal alignment is new or altered from preconstruction alignment. For projects that consist of new or altered vertical or horizontal alignment, the County will provide the location and length of the "no passing zones" during construction. For these projects, submit written notification to the Director not less than 21 calendar days prior to beginning striping.

For all projects, set a station identification stake at each right-of-way line at 100 foot intervals and at all locations where a change in right-of-way width occurs, or as otherwise approved by the Director. Mark each of these stakes with painted numerals, of a size readable from the roadway, corresponding to the project station at which it is located. As an exception to the above, for projects where Plans do not show right-of-way lines, set station identification stakes at locations and intervals appropriate to the type of work being done. For resurfacing and resurfacing/widening projects, set station identification stakes at 200 foot intervals, or as otherwise approved by the Director.

5-7.4.1 As-Built Drawings and Certified Surveys: The Contractor shall maintain one record copy of all specifications, plans, addenda, and shop drawings on site and in good order, annotated in red to depict all changes made during construction and exact location of underground or otherwise concealed components of the project, and any modifications to material types from that specified in the bid plans and specifications (“red line documents”). All subsurface improvements shall be as-built prior to backfilling. As-built red line plans shall be maintained on 11-inch by 17-inch prints and red line annotations shall be completed in a neat draftsman-like manner.

As-built red lines shall include both authorized and unauthorized changes to all project features, including but not limited to: horizontal pavement dimensions; finished pavement grades; finish dimensions, elevations, and alignment of all storm sewer, drainage structures, ponds, water main, sanitary sewer, force main, service lines, conduit, wiring, traffic loops, and signal interconnects; signal poles; light poles; and signs.

Demonstrating proper maintenance of as-built drawings shall be a precedent to each progress payment. The Contractor shall make available to Director, at any time requested, as-built information through the date of the request. If the Director determines the as-built information is inaccurate, inadequate, or untimely payment may be withheld until such time that the Contractor cures any noted deficiencies.

Upon completion of all work, but prior to authorization of final payment, the Contractor shall deliver to the Director one complete set as-built red line documents and certified surveys providing verification of all as-built dimensions and grades for review and approval. The certified survey shall include, but not be limited to:

1. Level Circuit: the survey shall include a final bench mark level circuit indicating the accuracy of vertical closure.
2. Control structure bench marks: the Contractor shall establish and document the location and elevation of bench marks on or within 100-feet of each control structure constructed or modified as part of the project. Each control structure bench mark elevation shall be clearly and permanently indicated on the bench mark.
3. Cross-sections: as-built finished cross-sections shall be performed at intervals not exceeding 100 feet, extending from right-of-way to right-of-way, but also including temporary or permanent easements as may be applicable. Cross sections shall include all elevation break points, and shall include edge of pavement and centerlines for all pavements.
4. 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.
5. 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.
 6. 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.
 7. System grading: dimensions, elevations, contours, and final grades or cross-sections to determine contributing drainage areas, flow directions, and conveyance of runoff to the system discharge points.
 8. Conveyance: dimensions, elevations, contours, final grades or cross-sections of systems utilized to divert off-site runoff around or through the new system.
 9. Water levels: existing water elevations and the date recorded.
 10. South Florida Water Management District (SFWMD): as-built surveys shall conform to any additional requirements and special conditions listed in the SFWMD's Environmental Resource Permit and any applicable local permit(s).
 11. Bridge clearances: for projects under the authority of a U.S. Coast Guard bridge permit, as-built clearances as described in the U.S. Coast Guard Owner's Certification of Bridge Completion. For bridges spanning roadways, provide a full as-built clearance envelope across the full width of the lower roadway(s).
 12. Projects under the authority of a U.S. Army Corps of Engineers permit: as-built surveys shall satisfy all of the requirements and special conditions listed in the U.S. Army Corps of Engineers permit.

All as-built survey information shall be signed and sealed by a licensed Professional Surveyor and Mapper duly registered in the State of Florida. No direct payment will be made for the cost of preparing, maintaining, and furnishing as-built plans and surveys as specified in this Article, the costs thereof shall be included in other items of work.

5-7.5 Personnel, Equipment, and Record Requirements: Employ only competent personnel and use only suitable equipment in performing layout work. Do not engage the services of any person or persons in the employ of the County for performance of layout work. All construction surveying and layout work, including dimensions and elevations associated with as-builts, shall be completed under the responsible charge of a licensed Professional Surveyor and Mapper duly registered in the State of Florida.

Keep adequate field notes and records while performing as layout work. Make these field notes and records available for the Director's review as the work progresses, and submit to the Director at the time of completion of the project. The Director's inspection, checking, or acceptance of the Contractor's field notes or layout work does not relieve the

Contractor of his responsibility to achieve the lines, grades, and dimensions shown in the Contract Documents.

Prior to final acceptance of the project, mark, in a permanent manner on the surface of the completed work, all horizontal control points originally furnished by the County.

5-7.6 Global Navigation Satellite Systems (GNSS) Work Plan: If used, submit a comprehensive written GNSS Work Plan to the Director for County review and acceptance at the preconstruction conference or at least 30 days before starting work using GNSS. Update the plan as necessary during construction and notify the County of all changes. The GNSS Work Plan shall describe how GNSS enabled Automated Machine Guidance technology will be integrated into other technologies employed on the project. At a minimum, the GNSS Work Plan will include the following:

1. Designate which portions of the Contract will be done using GNSS enabled Automated Machine Guidance and which portions will be constructed using conventional survey methodology.

2. Describe the manufacturer, model, and software version of the GNSS equipment.

3. Provide information on the qualifications of Contractor staff. Include formal training and field experience. Designate a single staff person as the primary contact for GNSS technology issues.

4. Describe how project control will be established. Include a list and map showing control points enveloping the site.

5. Describe site calibration procedures. Include a map of the control points used for site calibration and control points used to validate the site calibration. Describe the frequency of site calibration and how site calibration will be documented. At a minimum, verify the site calibration twice daily.

6. Describe the Contractor's quality control procedures for verifying mechanical calibration and maintenance of construction and guidance equipment. Include the frequency and type of verification performed to ensure the constructed grades conform to the Contract Documents.

Keep on site and provide upon request, a copy of the project's most up-to-date GNSS Work Plan at the project site.

5-7.7 Payment: Include the cost of performing layout work as described above in the Contract unit prices for the various items of work that require layout.

5-8 Contractor's Supervision.

5-8.1 Prosecution of Work: Give the work the constant attention necessary to ensure the scheduled progress, and cooperate fully with the Director and with other contractors at work in the vicinity.

5-8.2 Contractor's Superintendent: Maintain a competent superintendent at the site at all times while work is in progress to act as the Contractor's agent. Provide a superintendent who is a competent superintendent capable of properly interpreting the Contract Documents and is thoroughly experienced in the type of work being performed. Provide a superintendent with the full authority to receive instructions from the Director and to execute the orders or directions of the Director, including promptly supplying any materials, tools, equipment, labor, and incidentals that may be required. Provide such superintendence regardless of the amount of work sublet.

Provide a superintendent who speaks and understands English, and maintain at least one other responsible person who speaks and understands English, on the project during all working hours.

5-8.3 Supervision for Emergencies: Provide a responsible person, who speaks and understands English, and who is available at or reasonably near the worksite on a 24 hour basis, seven days a week. Designate this person as the point of contact for emergencies and in cases that require immediate action to maintain traffic or to resolve any other problem that might arise. Submit the phone numbers and names of personnel designated to be contacted in cases of emergencies, along with a description of the project location, to the Florida Highway Patrol and all other local law enforcement agencies.

5-9 General Inspection Requirements.

5-9.1 Cooperation by Contractor: Do not perform work or furnish materials without obtaining inspection by the Director. Provide the Director with safe means of access to the work, so the Director can determine whether the work performed and materials used are in accordance with the requirements and intent of the Contract Documents. If the Director so requests at any time before final acceptance of the work, remove or uncover such portions of the finished work as directed. After examination, restore the uncovered portions of the work to the standard required by the Contract Documents. If the Director determines that the work so exposed or examined is unacceptable, perform the uncovering or removal, and the replacing of the covering or making good of the parts removed, at no expense to the County. However, if the Director determines that the work thus exposed or examined is acceptable, the County will pay for the uncovering or removing, and the replacing of the covering or making good of the parts removed in accordance with Section 4-4.

5-9.2 Failure of Director to Reject Work During Construction: If, during or prior to construction operations, the Director fails to reject defective work or materials, whether from lack of discovery of such defect or for any other reason, such initial failure to reject in no way prevents the later rejection when such defect is discovered, or obligates the County to final acceptance. The County is not responsible for losses suffered due to any necessary removals or repairs of such defects.

5-9.3 Failure to Remove and Renew Defective Materials and Work: If the Contractor fails or refuses to remove and renew any defective materials used or work performed, or to make any necessary repairs in an acceptable manner and in accordance with the requirements of the Contract within the time indicated in writing, the Director has the authority to repair, remove, or renew the unacceptable or defective materials or work as necessary, all at the Contractor's expense. The County will obtain payment for any expense it incurs in making these repairs, removals, or renewals, that the Contractor fails or refuses to make, by deducting such expenses from any moneys due or which may become due the Contractor, or by charging such amounts against the Contract bond.

5-9.4 Inspection by Federal Government: When the United States Government or the State of Florida pays a portion of the cost of construction, its representatives may inspect the construction work as they deem necessary. However, such inspection will in no way make the Federal Government or the State of Florida a party to the Contract.

5-10 Final Inspection.

5-10.1 Maintenance until Acceptance: Maintain all Work until the Director has given final acceptance in accordance with 5-11.

5-10.2 Inspection for Acceptance: Upon submittal of written notification that all Contract Work, or all Contract Work on the portion of the Contract scheduled for acceptance, has been completed, the Director will make an inspection for acceptance. The inspection will be made within seven days of such notification. If the Director finds that all work has been satisfactorily completed, the County will consider such inspection as the final inspection. If any or all of the Work is found to be unsatisfactory, the Director will detail the remedial work required to achieve acceptance. Immediately perform such remedial work. Subsequent inspections will be made on the remedial work until the Director accepts all Work.

Upon satisfactory completion of the Work, the County will submit written notice of acceptance, either partial or final, to the Contractor.

Until final acceptance in accordance with 5-11, replace or repair any damage to the accepted Work. Payment of such work will be as provided in 7-14.

5-10.3 Partial Acceptance: At the Director's sole discretion, the Director may accept any portion of the Work under the provisions of 5-10.2.

5-10.4 Conditional Acceptance: The Director will not make, or consider requests for conditional acceptance of a project.

5-11 Final Acceptance.

When, upon completion of the final construction inspection of the entire project, the Director determines that the Contractor has satisfactorily completed the work, the Director will submit written notice of final acceptance to the Contractor.

5-12 Claims by Contractor.

5-12.1 General: When the Contractor deems that extra compensation or a time extension is due beyond that agreed to by the Director, whether due to delay, additional work, altered work, differing site conditions, breach of Contract, or for any other cause, the Contractor shall follow the procedures set forth herein for preservation, presentation and resolution of the claim.

Submission of timely notice of intent to file a claim, preliminary time extension request, time extension request, and the certified written claim, together with full and complete claim documentation, are each a condition precedent to the Contractor bringing any circuit court, arbitration, or other formal claims resolution proceeding against the County for the items and for the sums or time set forth in the Contractor's certified written claim. The failure to provide such notice of intent, preliminary time extension request, time extension request, certified written claim and full and complete claim documentation within the time required shall constitute a full, complete, absolute and irrevocable waiver by the Contractor of any right to additional compensation or a time extension for such claim.

5-12.2 Notice of Claim:

5-12.2.1 Claims For Extra Work: Where the Contractor deems that additional compensation or a time extension is due for work or materials not expressly provided for in the Contract or which is by written directive expressly ordered by the Director pursuant to 4-3, the Contractor shall submit written notification to the Director of the intention to make a claim for additional compensation before beginning the work on which the claim is based, and if seeking a time extension, the Contractor shall also submit a preliminary request for time extension pursuant to 8-7.3.2 within ten calendar days after commencement of a delay and a request for Contract Time extension pursuant to 8-7.3.2 within thirty calendar days after the elimination of the delay. If such written notification is not submitted and the Director is not afforded the opportunity for keeping strict account of actual labor, material, equipment, and time, the

Contractor waives the claim for additional compensation or a time extension. Such notice by the Contractor, and the fact that the Director has kept account of the labor, materials and equipment, and time, shall not in any way be construed as establishing the validity of the claim or method for computing any compensation or time extension for such claim. On projects with an original Contract amount of \$3,000,000 or less within 90 calendar days after final acceptance of the project in accordance with 5-11, and on projects with an original Contract amount greater than \$3,000,000 within 180 calendar days after final acceptance of the project in accordance with 5-11, the Contractor shall submit full and complete claim documentation as described in 5-12.3 and duly certified pursuant to 5-12.9. However, for any claim or part of a claim that pertains solely to final estimate quantities disputes the Contractor shall submit full and complete claim documentation as described in 5-12.3 and duly certified pursuant to 5-12.9, as to such final estimate claim dispute issues, within 90 or 180 calendar days, respectively, of the Contractor's receipt of the County's final estimate.

If the Contractor fails to submit a certificate of claim as described in 5-12.9, the County will so notify the Contractor in writing. The Contractor shall have ten calendar days from receipt of the notice to resubmit the claim documentation, without change, with a certificate of claim as described in 5-12.9, without regard to whether the resubmission is within the applicable 90 or 180 calendar day deadline for submission of full and complete claim documentation. Failure by the Contractor to comply with the ten calendar day notice shall constitute a waiver of the claim.

5-12.2.2 Claims For Delay: Where the Contractor deems that additional compensation or a time extension is due on account of delay, differing site conditions, breach of Contract, or any other cause other than for work or materials not expressly provided for in the Contract (Extra Work) or which is by written directive of the Director expressly ordered by the Director pursuant to 4-3, the Contractor shall submit a written notice of intent to the Director within ten days after commencement of a delay to a controlling work item expressly notifying the Director that the Contractor intends to seek additional compensation, and if seeking a time extension, the Contractor shall also submit a preliminary request for time extension pursuant to 8-7.3.2 within ten calendar days after commencement of a delay to a controlling work item, as to such delay and providing a reasonably complete description as to the cause and nature of the delay and the possible impacts to the Contractor's work by such delay, and a request for Contract Time extension pursuant to 8-7.3.2 within thirty calendar days after the elimination of the delay. On projects with an original Contract amount of \$3,000,000 or less within 90 calendar days after final acceptance of the project in accordance with 5-11, and on projects with an original Contract amount greater than \$3,000,000 within 180 calendar days after final acceptance of the project in accordance with 5-11, the Contractor shall submit full and complete documentation as described in 5-12.3 and duly certified pursuant to 5-12.9.

If the Contractor fails to submit a certificate of claim as described in 5-12.9, the County will so notify the Contractor in writing. The Contractor shall have ten calendar days from receipt of the notice to resubmit the claim documentation, without change, with a certificate of claim as described in 5-12.9, without regard to whether the resubmission is within the applicable 90 or 180 calendar day deadline for submission of full and complete claim documentation. Failure by the Contractor to comply with the ten calendar day notice shall constitute a waiver of the claim.

There shall be no Contractor entitlement to any monetary compensation or time extension for any delays or delay impacts, whatsoever, that are not to a controlling work

item, and then as to any such delay to a controlling work item entitlement to any monetary compensation or time extension shall only be to the extent such is otherwise provided for expressly under 4-3 or 5-12, except that in the instance of delay to a non-controlling item of work the Contractor may be compensated for the direct costs of idle labor or equipment only, at the rates set forth in 4-3.2.1(1) and (3), and then only to the extent the Contractor could not reasonably mitigate such idleness.

5-12.3 Content of Written Claim: As a condition precedent to the Contractor being entitled to additional compensation or a time extension under the Contract, for any claim, the Contractor shall submit a certified written claim to the County which will include for each individual claim, at a minimum, the following information:

1. A detailed factual statement of the claim providing all necessary dates, locations, and items of work affected and included in each claim;
2. The date or dates on which actions resulting in the claim occurred or conditions resulting in the claim became evident;
3. Identification of all pertinent documents and the substance of any material oral communications relating to such claim and the name of the persons making such material oral communications;
4. Identification of the provisions of the Contract which support the claim and a statement of the reasons why such provisions support the claim, or alternatively, the provisions of the Contract which allegedly have been breached and the actions constituting such breach;
5. A detailed compilation of the amount of additional compensation sought and a breakdown of the amount sought as follows:
 - a. documented additional job site labor expenses;
 - b. documented additional cost of materials and supplies;
 - c. a list of additional equipment costs claimed, including each piece of equipment and the rental rate claimed for each;
 - d. any other additional direct costs or damages and the documents in support thereof;
 - e. any additional indirect costs or damages and all documentation in support thereof.
6. A detailed compilation of the specific dates and the exact number of calendar days sought for a time extension, the basis for entitlement to time for each day, all documentation of the delay, and a breakout of the number of days claimed for each identified event, circumstance or occurrence.

Further, the Contractor shall be prohibited from amending either the bases of entitlement or the amount of any compensation or time stated for any and all issues claimed in the Contractor's written claim submitted hereunder, and any circuit court, arbitration, or other formal claims resolution proceeding shall be limited solely to the bases of entitlement and the amount of any compensation or time stated for any and all issues claimed in the Contractor's written claim submitted hereunder. This shall not, however, preclude a Contractor from withdrawing or reducing any of the bases of entitlement and the amount of any compensation or time stated for any and all issues claimed in the Contractor's written claim submitted hereunder at any time.

5-12.4 Action on Claim: The Director will respond in writing on projects with an original Contract amount of \$3,000,000 or less within 90 calendar days of receipt of a complete claim submitted by a Contractor in compliance with 5-12.3, and on projects with an original

Contract amount greater than \$3,000,000 within 120 calendar days of receipt of a complete claim submitted by a Contractor in compliance with 5-12.3. Failure by the Director to respond to a claim in writing within 90 or 120 days, respectively, after receipt of a complete claim submitted by the Contractor in compliance with 5-12.3 constitutes a denial of the claim by the Director. If the Director finds the claim or any part thereof to be valid, such partial or whole claim will be allowed and paid for to the extent deemed valid and any time extension granted, if applicable, as provided in the Contract. No circuit court proceedings on any claim, or a part thereof, may be filed until after final acceptance per 5-11 of all Contract work by the County or denial hereunder, whichever occurs last.

5-12.5 Pre-Settlement and Pre-Judgment Interest: Entitlement to any pre-settlement or pre-judgment interest on any claim amount determined to be valid subsequent to the County's receipt of a certified written claim in full compliance with 5-12.3, whether determined by a settlement or a final ruling in formal proceedings, the County shall pay to the Contractor simple interest calculated at the Prime Rate (as reported by the Wall Street Journal as the base rate on corporate loans posted by at least 75% of the nations 30 largest banks) as of the 60th calendar day following the County's receipt of a certified written claim in full compliance with 5-12.3, such interest to accrue beginning 60 calendar days following the County's receipt of a certified written claim in full compliance with 5-12.3 and ending on the date of final settlement or formal ruling.

5-12.6 Compensation for Extra Work or Delay:

5-12.6.1 Compensation for Extra Work: Notwithstanding anything to the contrary contained in the Contract Documents, the Contractor shall not be entitled to any compensation beyond that provided for in 4-3.2.

5-12.6.2 Compensation for Delay: Notwithstanding anything to the contrary contained in the Contract Documents, the additional compensation set forth in 5-12.6.2.1 shall be the Contractor's sole monetary remedy for any delay other than to perform extra work caused by the County unless the delay shall have been caused by acts constituting willful or intentional interference by the County with the Contractor's performance of the work and then only where such acts continue after Contractor's written notice to the County of such interference. The parties anticipate that delays may be caused by or arise from any number of events during the term of the Contract, including, but not limited to, work performed, work deleted, supplemental agreements, work orders, disruptions, differing site conditions, utility conflicts, design changes or defects, time extensions, extra work, right-of-way issues, permitting issues, actions of suppliers, subcontractors or other contractors, actions by third parties, suspensions of work by the Director pursuant to 8-6.1, shop drawing approval process delays, expansion of the physical limits of the project to make it functional, weather, weekends, holidays, special events, suspension of Contract Time, or other events, forces or factors sometimes experienced in construction work. Such delays or events and their potential impacts on the performance by the Contractor are specifically contemplated and acknowledged by the parties in entering into this Contract, and shall not be deemed to constitute willful or intentional interference with the Contractor's performance of the work without clear and convincing proof that they were the result of a deliberate act, without reasonable and good-faith basis, and specifically intended to disrupt the Contractor's performance.

5-12.6.2.1 Compensation for Direct Costs, Indirect Costs, Expenses, and Profit thereon, of or from Delay: For any delay claim, the Contractor shall be entitled to monetary compensation for the actual idle labor and equipment, and indirect costs, expenses, and

profit thereon, as provided for in 4-3.2.1(4) and solely for costs incurred beyond what reasonable mitigation thereof the Contractor could have undertaken.

5-12.7 Mandatory Claim Records: After submitting to the Director a notice of intent to file a claim for extra work or delay, the Contractor must keep daily records of all labor, material and equipment costs incurred for operations affected by the extra work or delay. These daily records must identify each operation affected by the extra work or delay and the specific locations where work is affected by the extra work or delay, as nearly as possible. The Director may also keep records of all labor, material and equipment used on the operations affected by the extra work or delay. The Contractor shall, once a notice of intent to claim has been timely filed, and not less than weekly thereafter as long as appropriate, submit the Contractor's daily records to the Director and be likewise entitled to receive the County's daily records. The daily records to be submitted hereunder shall be done at no cost to the recipient.

5-12.8 Claims For Acceleration: The County shall have no liability for any constructive acceleration of the work, nor shall the Contractor have any right to make any claim for constructive acceleration nor include the same as an element of any claim the Contractor may otherwise submit under this Contract. If the Director gives express written direction for the Contractor to accelerate its efforts, such written direction will set forth the prices and other pertinent information and will be reduced to a written Contract Document promptly. No payment will be made on a Supplemental Agreement for acceleration prior to the County's approval of the documents.

5-12.9 Certificate of Claim: When submitting any claim, the Contractor shall certify under oath and in writing, in accordance with the formalities required by Florida law, that the claim is made in good faith, that the supportive data are accurate and complete to the Contractor's best knowledge and belief, and that the amount of the claim accurately reflects what the Contractor in good faith believes to be the County's liability. Such certification must be made by an officer or director of the Contractor with the authority to bind the Contractor.

5-12.10 Non-Recoverable Items: The parties agree that for any claim the County will not have liability for the following items of damages or expense:

1. Loss of profit, incentives or bonuses;
2. Any claim for other than extra work or delay;
3. Consequential damages, including, but not limited to, loss of bonding capacity, loss of bidding opportunities, loss of credit standing, cost of financing, interest paid, loss of other work or insolvency;
4. Acceleration costs and expenses, except where the County has expressly and specifically directed the Contractor in writing "to accelerate at the County's expense"; nor
5. Attorney fees, claims preparation expenses and costs of litigation.

5-12.11 Exclusive Remedies: Notwithstanding any other provision of this Contract, the parties agree that the County shall have no liability to the Contractor for expenses, costs, or items of damages other than those which are specifically identified as payable under 5-12. In the event any legal action for additional compensation, whether on account of delay, acceleration, breach of contract, or otherwise, the Contractor agrees that the County's liability will be limited to those items which are specifically identified as payable in 5-12.

5-12.12 Settlement Discussions: The content of any discussions or meetings held between the County and the Contractor to settle or resolve any claims submitted by the Contractor against the County shall be inadmissible in any legal, equitable, or administrative proceedings brought by the Contractor against the County for payment of such claim.

5-12.13 Personal Liability of Public Officials: In carrying out any of the provisions of the Contract, Director or any of their respective employees or agents, there shall be no liability on behalf of any employee, officer or official of the County for which such individual is responsible, either personally or as officials or representatives of the County. It is understood that in all such matters such individuals act solely as agents and representatives of the County.

5-12.14 Auditing of Claims: All claims filed against the County shall be subject to audit at any time following the filing of the claim, whether or not such claim is part of a suit pending in the Courts of this State. The audit may be performed, at the County's sole discretion, by employees of the County or by any independent auditor appointed by the County, or both. The audit may begin after ten days written notice to the Contractor, subcontractor, or supplier. The Contractor, subcontractor, or supplier shall make a good faith effort to cooperate with the auditors. As a condition precedent to recovery on any claim, the Contractor, subcontractor, or supplier must retain sufficient records, and provide full and reasonable access to such records, to allow the County's auditors to verify the claim and failure to retain sufficient records of the claim or failure to provide full and reasonable access to such records shall constitute a waiver of that portion of such claim that cannot be verified and shall bar recovery thereunder. Further, and in addition to such audit access, upon the Contractor submitting a written claim, the County shall have the right to request and receive, and the Contractor shall have the affirmative obligation to submit to the County any and all documents in the possession of the Contractor or its subcontractors, materialmen or suppliers as may be deemed relevant by the County in its review of the basis, validity or value of the Contractor's claim.

Without limiting the generality of the foregoing, the Contractor shall upon written request of the County make available to the County's auditors, or upon the County's written request, submit at the County's expense, any or all of the following documents:

1. Daily time sheets and foreman's daily reports and diaries;
2. Insurance, welfare and benefits records;
3. Payroll register;
4. Earnings records;
5. Payroll tax return;
6. Material invoices, purchase orders, and all material and supply acquisition contracts;
7. Material cost distribution worksheet;
8. Equipment records (list of company owned, rented or other equipment used);
9. Vendor rental agreements and subcontractor invoices;
10. Subcontractor payment certificates;
11. Canceled checks for the project, including, payroll and vendors;
12. Job cost report;
13. Job payroll ledger;
14. General ledger, general journal, (if used) and all subsidiary ledgers and journals together with all supporting documentation pertinent to entries made in these ledgers and journals;
15. Cash disbursements journal;
16. Financial statements for all years reflecting the operations on this project;

17. Income tax returns for all years reflecting the operations on this project;

18. All documents which reflect the Contractor's actual profit and overhead during the years this Contract was being performed and for each of the five years prior to the commencement of this Contract;

19. All documents related to the preparation of the Contractor's bid including the final calculations on which the bid was based;

20. All documents which relate to each and every claim together with all documents which support the amount of damages as to each claim;

21. Worksheets used to prepare the claim establishing the cost components for items of the claim including, but not limited to, labor, benefits and insurance, materials, equipment, subcontractors, and all documents that establish which time periods and individuals were involved, and the hours and rates for such individuals.

5-13 Recovery Rights, Subsequent to Final Payment.

The County reserves the right, if it discovers an error in the partial or final estimates, or if it discovers that the Contractor performed defective work or used defective materials, after the final payment has been made, to claim and recover from the Contractor or his surety, or both, by process of law, such sums as may be sufficient to correct the error or make good the defects in the work and materials.

SECTION 6 CONTROL OF MATERIALS

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 Director may inspect and test any material, at points of production, distribution and use.

6-1.2 Sampling and Testing: Use the FDOT'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 County.

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 County.

6-1.2.1 Pretest by Manufacturers: Submit certified manufacturer's test results to the Director for qualification and use on County projects. Testing will be as specified in the Contract Documents. The County 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 County 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 manufacturer certification. The County may reject all materials that, when retested, do not meet the requirements of these Specifications.

6-1.3 Certification:

6-1.3.1 Manufacturer Material Certification: Submit material certifications for all materials to the Director for approval when required by the Specifications. Materials will not be considered for payment when not accompanied by a material certification. Sample material certification forms are available on FDOT's website at the following URL: http://www.fdot.gov/materials/administration/resources/library/publications/certifications/sample_forms.shtml . Ensure that the material certification follows the format of the sample form, is submitted on the manufacturer's letterhead and is signed by a legally responsible person employed by the manufacturer.

6-1.3.1.1 FDOT Approved Product List: The FDOT Approved Products List (APL) is a database that provides assurance to Contractors, consultants, designers, and County personnel that specific products and materials are approved for use on County facilities. The County will limit the Contractor's use of products and materials that require use of APL items to those listed on the FDOT APL effective at the time of placement. Where the terms Qualified Products List (QPL) appear in the Contract Documents, they will be synonymous with Approved Product List (APL).

Manufacturers seeking to have a product evaluated for the FDOT APL must do so through coordination with FDOT. Information on the process may be obtained

on the FDOT website at the following URL:
<http://www.fdot.gov/programmanagement/ProductEvaluation/Default.shtm>

6-1.3.2 Contractor Installation Certification: Submit 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 an FM 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 County 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 County may reject improperly stored materials.

6-3.2 Use of Right-of-Way for Storage: If the Director 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 County or as specified in the Contract Documents. Provide any additional space required at no expense to the County.

6-3.3 Responsibility for Stored Materials: Accept responsibility for the protection of stored materials. The County 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 Director 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 County.

Do not use material that has been rejected, until the Director has approved the material's use. Upon failure to comply promptly with any order of the Director made under the provisions of this Article, the Director has the authority to have the defective material removed and replaced by other forces and deduct the cost of removal and replacement from any moneys due or to become due the Contractor.

6-4.1 Engineering Analysis: As an exception to the above, within 30 calendar days of the termination of the LOT or rejection of the material, the Contractor may submit to the

Director a proposed Engineering Analysis Scope to determine the disposition of the material. The Engineering Analysis Scope must contain at a minimum:

1. Description of the defective materials.
2. Supporting information, testing or inspection reports with nonconformities, pictures, drawings, and accurately dimensioned deficiency maps as necessary. For cracked elements, provide drawings showing the location, average width, depth, length, and termination points of each crack along the surfaces. Provide the distance from each termination point to a fixed reference point on the component, such as beam end or edge of flange.
3. Proposed approach of investigation and analysis.
4. Name and credentials of the proposed Specialty Engineer or Contractor's Engineer of Record who will perform the engineering analysis.
5. Proposed testing laboratories, qualified in accordance with Section 105-7.

Upon approval of the Engineering Analysis Scope by the Director, the Specialty Engineer or Contractor's Engineer of Record may perform the engineering analysis as defined in the approved scope and submit a signed and sealed Engineering Analysis Report (EAR) to the Director. The EAR must contain at a minimum:

1. The approved Engineering Analysis Scope.
2. Any investigations performed and the associated results obtained.
3. Analysis and conclusion.
4. Proposed disposition of the material, addressing the performance and durability of the proposed action.

Provide as appropriate:

1. Written evidence of a previously approved comparable deficiency and its repair.
2. Documented research demonstrating the effectiveness of the proposed repair.
3. Engineering calculations.

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 within 45 calendar days of the Director's approval of the Engineering Analysis Scope, complete and submit the EAR. The EAR must be signed and sealed by the Specialty Engineer or the Contractor's Engineer of Record that performed the engineering analysis. The Director will determine the final disposition of the material after review of the EAR. 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.

6-5.1 Source of Supply—Convict Labor (Designated 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 County 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.

6-5.2 Source of Supply-Steel (Designated State or Federal-Aid Contracts Only): Use steel and iron manufactured 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 continuing through the final shaping and coating. If a steel or iron product is taken outside the United States for any manufacturing process, it becomes foreign source material. When using steel or iron materials as a component of any manufactured product (e.g., concrete pipe, prestressed beams, corrugated steel pipe, etc.), these same provisions apply. Foreign steel and iron may be used when the total actual cost of such foreign materials does not exceed 0.1% of the total Contract amount or \$2,500, 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. Submit a certification from the manufacturer of steel or iron, or any product containing steel or iron, stating that all steel or iron furnished or incorporated into the furnished product was produced and manufactured in the United States or a statement that the product was produced within the United States except for minimal quantities of foreign steel and iron valued at \$ (actual cost). Submit each such certification to the Director prior to incorporating the material or product into the project. Prior to the use of foreign steel or iron materials on a project, submit invoices to document the actual cost of such material, and obtain the Director's written approval prior to incorporating the material into the project

6-5.3 Contaminated, 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 County of Environmental Protection or the U.S. Environmental Protection Agency (EPA). Provide workplaces free from serious recognized hazards and to comply with occupational safety and health standards, as determined by the U.S. County of Labor Occupational Safety and Health Administration (OSHA).

SECTION 7 LEGAL REQUIREMENTS AND RESPONSIBILITY TO THE PUBLIC

7-1 Laws to be Observed.

7-1.1 General: Become familiar with and comply with all Laws and Regulations, including all Federal, State, and Local Rules and Regulations that control the action or operation of those engaged or employed in the work or that affect material used. Pay particular attention called to the safety regulations promulgated by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). In addition, comply with Chapter 403, of the Florida Statutes, regarding control of air pollution. Direct special attention to that portion of Chapter 62-256, Rules of the Department of Environmental Protection, Florida Administrative Code, pertaining to open burning in land clearing operations. Where work or structures included in the Contract are in “Navigable Waters of the U.S.,” (reference 33 of the Code of Federal Regulations, Part 329); “Waters of the U.S.,” (reference 33 of the Code of Federal Regulations, Parts 323 and 328); or “Waters of the State,” (reference Part 4, Chapters 253 and 373 of the Florida Statutes and Section 62-340 of the Florida Administrative Code); comply with the regulatory provisions of Section 404 of the Federal Clean Water Act of 1977; Sections 9 and 10 of the Federal River and Harbor Act of 1899; Chapter 161 of the Florida Statutes; and any local authority having jurisdiction over such waters.

Obtain certification from the Construction Industry Licensing Board as required by Part I, Chapter 489, of the Florida Statutes, regardless of exemptions allowed by subsection 489.103, prior to removing underground pollutant storage tanks. Dispose of tanks and pollutants in accordance with the requirements and regulations of any Federal, State, or local, agency having jurisdiction.

Prior to building construction or renovation, submit current registrations or certifications issued by the Florida Construction Industry Licensing Board in accordance with Chapter 489, for the appropriate category of construction.

Corporations must be registered with the State of Florida, Department of State, Division of Corporations, and hold a current State Corporate Charter Number in accordance with Chapter 607, Florida Statutes.

The Contractor or the authorized subcontractor applying the roofing material must be licensed or be an approved dealer and applicator of the proposed roofing material.

Indemnify, defend, and save harmless the County and all of its officers, agents, and employees, in the amount of the Contract price, against all claims or liability arising from or based on the violation of any such Federal, State, and Local Rules and Regulations, whether by himself or his employees.

The Contractor shall comply with all environmental permits, including measures identified in the National Pollutant Discharge Elimination System (NPDES) Stormwater Pollution Prevention Plan and Sediment and Erosion Control Plan for the work. The Contractor’s attention is also directed to the applicable regulations of the South Florida Water Management District.

The Lee County Noise Control Ordinance is in effect regulating noise generated from construction activity associated with the project. The Contractor shall comply with the requirements therein.

The Contractor shall exert every reasonable and diligent effort to ensure that all labor employed by the Contractor and his subcontractors for work on the project work harmoniously and

compatibly with all labor used by other building and construction contractors now or hereafter on the site of the work covered by this Contract. Include this provision in all subcontracts, and require all subcontractors to include it in their subcontracts with others. However, do not interpret or enforce this provision so as to deny or abridge, on account of membership or non-membership in any labor union or labor organization, the right of any person to work as guaranteed by Article I, Section 6 of the Florida Constitution.

Comply with Chapter 556 of the Florida Statutes during the performance of excavation or demolition operations.

The Executive Order 11246 Electronic version, dated September 24, 1965 is posted on FDOT's website at the following URL address:

<http://www.fdot.gov/programmanagement/Implemented/URLinSpecs/Files/deo11246.pdf>

Take responsibility to obtain the information posted on this website up through five calendar days before the opening of bids and comply with the provisions contained in Executive Order 11246.

If the FDOT's website cannot be accessed, contact the FDOT's Specifications Office Web Coordinator at (850) 414-4101.

7-1.2 Plant Quarantine Regulations: The U.S. Department of Agriculture and the Florida Department of Agriculture and Consumer Services have issued quarantine regulations pertaining to control of the nematodes of citrus, Rule 5B-44, Florida Administrative Code, and other plant pests. Contact the local (or other available) representatives of the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture, and the Division of Plant Industry of the Florida Department of Agriculture and Consumer Services to ascertain all current restrictions regarding plant pests that are imposed by these agencies. Keep advised of current quarantine boundary lines throughout the construction period.

These restrictions may affect operations in connection with such items as clearing and grubbing, earthwork, grassing and mulching, sodding, landscaping, and other items which might involve the movement of materials containing plant pests across quarantine lines.

Obtain quarantine regulations and related information from the following:

Animal and Plant Health Inspection Service
U.S. Department of Agriculture
3029 Lake Alfred Road
Winter Haven, Florida 33881

Director, Division of Plant Industry
Florida Department of Agriculture and Consumer Services
Post Office Box 147100
Gainesville, Florida 32614-7100

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 Director 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 Director'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.

7-1.4 Compliance with Federal Endangered Species Act and other Wildlife Regulations:

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

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

These guidelines are posted at the following URL address: <http://www.fdot.gov/programmanagement/Implemented/URLinSpecs/files/endangeredwildlifeguidelines.pdf>.

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

Prior to establishing any off-project activity in conjunction with a project, notify the Director of the proposed activity. Covered activities include but are not necessarily limited to borrow pits, concrete or asphalt plant sites, disposal sites, field offices, and material or equipment storage sites. Include in the notification the Project Number, Financial Project ID, a description of the activity, the location of the site by township, range, section, county, and city, a site location map including the access route, the name of the property owner, and a person to contact to arrange a site inspection. Submit this notification at least 30 days in advance of planned commencement of the off-site activity, to allow for the County to conduct an investigation without delaying job progress.

Do not perform any off-project activity without obtaining written clearance from the Director. In the event the County's investigation determines a potential impact to a protected, threatened or endangered species and mitigation measures or permits are necessary, coordinate with the appropriate resource agencies for clearance, obtain permits and perform mitigation measures as necessary. Immediately notify the Director in writing of the results of this coordination with the appropriate resource agencies. Additional compensation or time will not be allowed for permitting or mitigation, associated with Contractor initiated off-project activities. The Contractor shall maintain at the jobsite written proof of authorization for the use of any off-project property in conjunction with the project. All off-project properties shall be maintained in a neat and orderly fashion and then restored to the property owner's satisfaction upon terminating the use associated with the project.

7-1.5 Occupational Safety and Health Requirements: The Contractor shall take all precautions necessary for the protection of life, health, and general occupational welfare of all persons, including employees of both the Contractor and the County, until the Contractor has completed the work required under the Contract as provided in 5-10 and 5-11.

Comply at all times with applicable Federal, State, and local laws, provisions, and policies governing safety and health, including 29 CFR 1926, including all subsequent revisions and updates.

7-1.6 Discovery of an Unmarked Human Burial: When an unmarked human burial is discovered, immediately cease all activity that may disturb the unmarked human burial and notify the Director. Do not resume activity until specifically authorized by the Director.

7-1.7 Insecticides, Herbicides and Fertilizers:

7-1.7.1 Insecticides and Herbicides: Use products found on the following website, <http://state.ceris.purdue.edu/>, approved by the Florida Department of Agriculture and Consumer Services. 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 insecticides and herbicides are applied in accordance with Chapter 5E-9, Florida Administrative Code. Submit a copy of current certificates to the Director upon request.

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.

7-1.7.2 Fertilizer: Ensure that all employees applying fertilizer, possess a current Florida Department of Agriculture and Consumer Services Commercial Applicator license in accordance with Section 482.1562, F.S. Upon request, submit the current certificates to the Director.

7-1.8 Compliance with Section 4(f) of the USDOT Act (Designated State or Federal-Aid Contracts Only): Section 4(f) of the USDOT Act prohibits the U. S. Secretary of Transportation from approving a project which requires the use of publicly owned land of a public park, recreation area or a wildlife and waterfowl refuge, or of any historic site of national, state, or local significance unless there is no prudent or feasible alternative to using that land and the program or project includes all possible planning to minimize the harm to the site resulting from the use.

Before undertaking any off-project activity associated with any federally assisted undertaking, ensure that the proposed site does not represent a public park, recreation area, wildlife or waterfowl refuge, or a historic site (according to the results of the Cultural Resources Survey discussed in 120-6.2). If such a site is proposed, notify the Director and provide a description of the proposed off-site activity, Project Number, Financial Project ID, the location of the site by township, range, section, a county or city map showing the site location, including the access route and the name of the property. It is the Contractor's responsibility to submit justification for use of Section 4(f) property that is sufficient for the County, the Florida Department of Transportation and the Federal Highway Administration to make a Section 4(f) determination. Submit this notification

sufficiently in advance of planned commencement of the off-site activity to allow a reasonable time for the Director to conduct an investigation without delaying job progress. Do not begin any off-project activity without obtaining written clearance from the Director.

7-1.9 Reserved.

7-2 Permits and Licenses.

7-2.1 General: Pursuant to Section 218.80, Florida Statutes, the County will pay for all County permits and fees, including license fees, permit fees, impact fees or inspection fees applicable to the Work. Contractor is not responsible for paying for permits issued by the County wherein the Work is to be performed, but is responsible for acquiring all other permits. The County may require the Contractor to deliver internal budget transfer documents to applicable County agencies when the Contractor is acquiring permits. Except for permits procured by the County, as incorporated by Special Provision expanding this Subarticle, if any, the Contractor will procure all permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work.

The County will also acquire any modifications or revisions to an original permit incorporated by Special Provision to this Subarticle when the Contractor requires such modifications or revisions to complete the construction operations specified in the Plans or Special Provisions and within the right-of-way limits.

Acquire all permits for work performed outside the right-of-way or easements for the project.

In carrying out the work in the Contract, when under the jurisdiction of any environmental regulatory agency, comply with all regulations issued by such agencies and with all general, special, and particular conditions relating to construction activities of all permits issued to the County as though such conditions were issued to the Contractor. Post all permit placards in a protected location at the worksite.

The Contractor shall be fully responsible for the execution and adherence to all directives, instructions, conditions, special conditions, and limiting conditions contained in permits specifically issued for the Work and which pertain to or affect the construction phase of this project, and shall be solely responsible for issuance of any Notices required thereby.

In case of a discrepancy between any permit condition and other Contract Documents, the more stringent condition shall prevail.

7-2.2 Work or Structures in Navigable Waters of the U.S., Waters of the U.S., and Waters of the State: In general, one or more governmental agencies will exercise regulatory authority over work or structures, including related construction operations, in all tidal areas (channelward of the mean high water lines on the Atlantic and Gulf Coast); in the ocean and gulf waters to the outer limits of the continental shelf; in all rivers, streams, and lakes to the ordinary high water line; in marshes and shallows that are periodically inundated and normally characterized by aquatic vegetation capable of growth and reproduction; in all artificially created channels and canals used for recreational, navigational, or other purposes that are connected to navigable waters; and in all tributaries of navigable waters up to their headwaters.

Whenever the work under or incidental to the Contract requires structures or dredge/fill/construction activities in “Navigable Waters of the U.S.,” “Waters of the U.S.,” and “Waters of the State,” the Federal, State, county, and local regulatory agencies may require the County to obtain a permit. For such dredge/fill /construction specified in the Plans to be

accomplished within the limits of the project, or for any dredge/fill/construction within the limits of County-furnished borrow areas, the County will procure the necessary permits prior to advertising for bids.

7-2.3 Reserved.

7-3 Patented Devices, Materials and Processes.

Include all royalties and costs arising from patents, trademarks, and copyrights, in any way involved in the work in the Contract price. Whenever using any design, device, material, or process covered by letters patent or copyright, obtain the right for such use by suitable legal agreement with the patentee or owner of the copyright. File a copy of such agreement with the Director. However, whether or not such agreement is made or filed as noted, the Contractor and the surety in all cases shall indemnify, defend, and save harmless, the County from all claims for infringement by reason of the use of any such patented design, device, material, or process on work under the Contract, and shall indemnify the County for all costs, expenses, and damages that it may be obliged to pay by reason of any such infringement, at any time during the prosecution or after the completion of the work.

7-4 Right-of-Way Furnished by the County.

Except as otherwise stipulated in these Specifications or as shown in the Plans, the County will furnish all rights-of-way necessary for the proper completion of the work at no expense to the Contractor.

Should County-furnished areas for obtaining borrow material, contain limerock material do not remove such material from the pit unless the Director gives specific approval.

Use of County owned right-of-way for the purpose of equipment or material storage, lay-down facilities, pre-cast material fabrication sites, batch plants for the production of asphalt, concrete or other construction related materials, or other similar activities, shall require advance written approval by the County prior to making use of said County owned right of way. Use of County owned right of way for these purposes is expressly limited to the storage of equipment and materials for the Project or production of materials or products for the Project. As a precedence to Final Acceptance of the project, any County owned right-of-way used by the Contractor shall be restored to the condition existing prior to construction, or as otherwise approved by the Director.

The County reserves the right to allow parties other than the Contractor, upon presentation of a duly authorized and satisfactory Lee County Department of Transportation Right-of-Way Permit, to perform work within the limits of construction. In all such instances, the Contractor will afford parties bearing such permits reasonable accommodation for the proper execution of the work described under the permit, including the right to store materials and equipment. All parties authorized to perform work within the right-of-way shall make, in an acceptable manner, all necessary repairs due to such work ordered by the Director and shall be subject to the conditions specified in Section 11-12 of the Lee County Administrative Code, as amended.

7-5 Reserved.

7-6 Sanitary Provisions.

The Contractor shall provide and maintain, in a neat and sanitary condition, such accommodations for the use of his employees as are necessary to comply with the requirements and regulations of the State and local boards of health. Commit no public nuisance.

7-7 Control of the Contractor's Equipment.

7-7.1 Traffic Interference: Do not allow equipment, while it is on or traversing a road or street, to unreasonably interfere with traffic.

7-7.2 Overloaded Equipment: Do not operate on any road, street or bridge including a County owned temporary bridge, any hauling unit or equipment loaded in excess of:

1. the maximum weights specified in the Florida Highway Patrol, Commercial Motor Vehicle Manual (Trucking Manual), or
2. lower weight limits legally established and posted for any section of road or bridge by FDOT, the County or other local authorities.

The governmental unit having jurisdiction over a particular road or bridge may provide exceptions by special permit under the provisions of 7-7.3.

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.

7-7.3 Crossings: Where it is necessary to cross an existing road or street, including specifically the existing traveled lanes of a divided highway within the limits of the project, obtain permits from the County, for crossing overloaded or oversized equipment. Cross existing roads or streets only at Director-designated points. The Director may require the Contractor to protect the pavement or Roadway at the crossing by using lumber, planks, or fill. Provide flagging and watchman service, or approved signal devices, for the protection of traffic at all such crossings, in accordance with an approved written plan for that activity. Movement of equipment around the project site must be in accordance with requirements of the Standard Plans and not create an undue hazard to the traveling public or workers.

7-7.4 Protection from Damage by Tractor-Type Equipment: Take positive measures to ensure that tractor-type equipment does not damage the road. If any such damage should occur, repair it without delay, at no expense to the County and subject to the Director's approval.

7-7.5 Contractor's Equipment on Bridge Structures: The Contractor's Engineer of Record 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 in 7-7.2:
 - 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 Contractor's Engineer of Record 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 County for approval the 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 Contractor's Engineer of Record shall sign and seal the drawings and the cover sheet of the calculations for the County's Record Set.

7-7.6 Posting of the Legal Gross Vehicular Weight: Display the maximum legal gross weight, as specified in the Florida Uniform Traffic Code, in a permanent manner on each side of any dump truck or dump type tractor-trailer unit hauling embankment material, construction aggregates, road base material, or hot bituminous mixture to the project over any public road or street. Display the weight in a location clearly visible to the scale operator, in numbers that contrast in color with the background and that are readily visible and readable from a distance of 50 feet.

7-8 Structures over Navigable Waters.

7-8.1 Compliance with Federal and Other Regulations: When working on structures in, adjacent to, or over, navigable waters, observe all regulations and instructions of Federal and other authorities having control over such waters. Do not obstruct navigation channels without permission from the proper authority, and provide and maintain navigation lights and signals in accordance with the Federal requirements for the protection of the structure, of false work, and of navigation.

When working on moveable bridges, requests for temporarily changing the operating requirements for the moveable bridge must be submitted in writing to the appropriate Coast Guard District Bridge Branch, 90 days before the start of any action.

For all other bridges, notify the appropriate Coast Guard District Bridge Branch, at least 60 days prior to the start of any operations including construction and 30 days prior to any channel operations, closures, or opening restrictions.

When work platforms are indicated in the permit for construction, submit work platform construction plans to the appropriate Coast Guard District for approval. Obtain approval prior to beginning construction on the platform.

7-8.2 Maintenance of Channel: Where the work includes the excavation of a channel or other underwater areas to a required section, maintain the section from shoaling or other encroachment until final acceptance of the project.

In the event of accidental blocking of the navigation channel, immediately notify the U.S. Coast Guard of the blockage and upon removal of the blockage.

7-9 Use of Explosives.

When using explosives for the prosecution of the work, exercise the utmost care not to endanger life or property, including new work. The Contractor is responsible for all damage resulting from the use of explosives. Any use of explosives shall be subject to the prior written authorization of the Director.

Store all explosives in a secure manner in compliance with all laws and ordinances, and clearly mark all such storage places with the words: "DANGEROUS - EXPLOSIVES". Place such storage in the care of a competent watchman. Where no local laws or ordinances apply, provide storage satisfactory to the Director and, in general, not closer than 1,000 feet from the road or from any building, camping area, or place of human occupancy.

Notify each public utility company having structures in proximity to the site of the work of the intention to use explosives. Give such notice sufficiently in advance to enable the companies to take precautionary steps to protect their property from injury.

7-10 Forest Protection.

7-10.1 Compliance with State and Federal Regulations: In carrying out work within or adjacent to State or National forests or parks, comply with all of the regulations of the State or Federal authority having jurisdiction, governing the protection of and the carrying out of work in forests or parks, and observe all sanitary laws and regulations with respect to the performance of work in these areas. Keep the areas in an orderly condition, dispose of all refuse, and obtain permits for the construction, installation, and maintenance of any construction camps, living quarters, stores, warehouses, sanitary facilities, and other structures; all in accordance with the requirements of the forest or park official.

7-10.2 Prevention and Suppression of Forest Fires: Take all reasonable precautions to prevent and suppress forest fires. Require employees and subcontractors, both independently and at the request of forest officials, to do all reasonably within their power to prevent and suppress forest fires. Assist in preventing and suppressing forest fires, and make every possible effort to notify a forest official at the earliest possible moment of the location and extent of all fires. Extinguish the fire if practicable.

7-11 Preservation of Existing Property.

7-11.1 General: Preserve from damage all existing property within the project limits of or in any way affected by the Work, the removal or destruction of which is not specified in the Plans. This applies to, but is not limited to, public and private property, public and private utilities (except as modified by the provisions of 7-11.5), trees, shrubs, crops, sod, signs, monuments, fences, guardrail, pipe and underground structures, Intelligent Transportation Systems (ITS) facilities, traffic control signals and devices, highway lighting, and public highways (except natural wear and tear of highway resulting from legitimate use thereof by the Contractor).

County owned underground facility locations shown in the Plans are approximate. Unless otherwise shown in the Plans, County owned underground facilities will not be located by the County nor through notification to "Sunshine 811".

Whenever the Contractor's activities damage such existing property, immediately restore it to a condition equal to or better than that existing at the time such damage occurred, at no expense to the County. Temporary repairs may be used to immediately restore ITS facilities and traffic control signals and devices. Permanent repairs to ITS facilities and traffic control signals and devices shall be made within 90 days of any temporary repairs and prior to final acceptance of the project. Submit permanent ITS facility repair plans to the Director prior to beginning repair work.

Protect existing bridges during the entire construction period from damage caused by the Work. Immediately repair, at no expense to the County, all damage to existing bridges caused by the Work, prior to continuing the Work. The County will not require the Contractor to provide routine repairs or maintenance for such structures.

Direct special attention to the protection of all geodetic monuments, horizontal or vertical, and Public Land Survey Corners located within the project. If any geodetic monument or Public Land Survey Corner, located within the project, is at risk of being damaged or destroyed, immediately notify the Director. Locate and replace any damaged or destroyed geodetic monuments or Public Land Survey Corners under the direction of a Professional Surveyor and Mapper registered in the State of Florida.

Whenever the actions of a third party damage such existing property and is not otherwise due to any fault or activities of the Contractor, either restore it to a condition equal to or better than that existing at the time such damage occurred or provide access and coordinate with the County's maintenance Contractor in accordance with 8-4.4 as directed by the Director. The County will compensate the Contractor for the costs associated with the repairs for restoring the existing property in accordance with 4-4. Theft and vandalism are considered damage caused by a third party.

7-11.2 Failure to Restore Damaged Existing Property: In case of failure on the part of the Contractor to restore such property, bridge, road or street, or to make good such damage or injury, the Director may, upon 48 hours notice, proceed to repair, rebuild, or otherwise restore such property, road, or street as may be deemed necessary, and the County will deduct the cost thereof from any monies due or which may become due the Contractor under the Contract. Nothing in this clause prevents the Contractor from receiving proper compensation for the removal, damage, or replacement of any public or private property, not shown in the Plans, that is made necessary by alteration of grade or alignment. The Director will authorize such work, provided that the Contractor, or his employees or agents, have not, through their own fault, damaged such property.

7-11.3 Contractor's Use of Streets and Roads:

7-11.3.1 Street and Road System: When hauling materials or equipment to the project over roads and bridges on the State Highway System, State park road system, county road system, or city street system, and such use causes damage, immediately, at no expense to the County, repair such road or bridge to as good a condition as before the hauling began.

The County may modify the above requirement in accordance with any agreement the Contractor might make with the governmental unit having jurisdiction over a particular road or bridge, provided that the Contractor submits written evidence of such agreement to the Director.

7-11.3.2 Reserved.

7-11.3.3 Within the Limits of a Construction Project: The County will not allow the operation of equipment or hauling units of such weight as to cause damage to previously constructed elements of the project, including but not necessarily limited to bridges, drainage structures, base course, and pavement. Do not operate hauling units or equipment loaded in excess of the maximum weights specified in 7-7.2 on existing pavements that are to remain in place (including pavement being resurfaced), cement-treated subgrades and bases, concrete pavement, any course of asphalt pavement, and bridges. The Director may allow exceptions to these weight restrictions for movement of necessary equipment to and from its worksite, for hauling of offsite fabricated components to be incorporated into the project, and for crossings as specified in 7-7.3.

7-11.4 Operations within Railroad Right-of-Way:

7-11.4.1 Notification to the Railroad Company: Notify the superintendent of the railroad company, as shown in the Plans, and the Director at least 72 hours before beginning any operation within the limits of the railroad right-of-way; any operation requiring movement of

employees, trucks, or other equipment across the tracks of the railroad company at other than an established public crossing; and any other work that may affect railroad operations or property.

7-11.4.2 Contractor's Responsibilities: Comply with whatever requirements an authorized representative of the railroad company deems necessary in order to safeguard the railroad's property and operations. The Contractor is responsible for all damages, delays, or injuries and all suits, actions, or claims brought on account of damages or injuries resulting from the Contractor's operations within or adjacent to railroad company right-of-way.

7-11.4.3 Watchman or Flagging Services: The railroad company will furnish protective services (i.e., watchman or flagging services) to ensure the safety of railroad operations during certain periods of the project. The Contractor will reimburse the railroad company for the cost thereof. Schedule work that affects railroad operations so as to minimize the need for protective services by the railroad company.

7-11.5 Utilities:

7-11.5.1 Arrangements for Protection or Adjustment: Do not commence work at points where the construction operations are adjacent to utility facilities until all necessary arrangements have been made for removal, temporary removal, relocation, de-energizing, deactivation or adjustment with the utility facilities owner to protect against damage that might result in expense, loss, disruption of service, or other undue inconvenience to the public or to the owners. The Contractor is solely and directly responsible to the owners and operators of such properties for all damages, injuries, expenses, losses, inconveniences, or delays caused by the Contractor's operations.

Do not request utility removal, temporary removal, relocation, de-energizing, deactivation, or adjustment when work can be accomplished within the utility work schedules. In the event that removal, temporary removal, relocation, de-energizing, deactivation, or adjustment of a utility or a particular sequence of timing in the relocation of a utility is necessary and has not been addressed in a utility work schedule, the Director will determine the necessity for any such utility work. Coordinate such work as to cause the least impediment to the overall construction operations and utility service. The County is not responsible for utility removal, temporary removal, relocation, de-energizing, deactivation, or adjustment work where such work is determined not necessary by the Director or done solely for the benefit or convenience of the utility owner or its contractor, or the Contractor.

7-11.5.2 Cooperation with Utility Owners: Cooperate with the owners of all underground or overhead utility lines in their removal and rearrangement operations in order that these operations may progress in a reasonable manner, that duplication or rearrangement work may be reduced to a minimum, and that services rendered by the utility owners will not be unnecessarily interrupted.

In the event of interruption of water or other utility services as a result of accidental breakage, exposure, or lack of support, promptly notify the proper authority and cooperate with the authority in the prompt restoration of service. If water service is interrupted and the Contractor is performing the repair work, the Contractor shall work continuously until the service is restored. Do not begin work around fire hydrants until the local fire authority has approved provisions for continued service.

7-11.5.3 Utility Adjustments: Certain utility adjustments and reconstruction work may be underway during the progress of the Contract. Cooperate with the various utility construction crews who are maintaining utility service. Exercise due caution when working adjacent to relocated utilities. The Contractor shall repair all damage to the relocated utilities resulting from his operations

at no expense to the County. The requirements of 7-11.1 and 7-11.5.2 outline the Contractor's responsibility for protecting utility facilities. The County will include in the Contract the utility authorities who are scheduled to perform utility work on the project.

7-11.5.4 Weekly Meetings: Conduct weekly meetings on the job site with all the affected utility companies and the Director in attendance to coordinate project construction and utility relocation. Submit a list of all attendees one week in advance to the Director for approval.

Submit the approved Work Progress Schedule and Work Plan for the project, as specified in 8-3.2, to document the schedule and plan for road construction and utility adjustments.

When utility relocations no longer affect construction activities, the Contractor may discontinue the meetings with the Director's approval.

7-12 Reserved.

7-13 Reserved.

7-13.1 Reserved.

7-13.2 Reserved.

7-13.3 Reserved.

7-13.4 Insurance for Protection of Utility Owners: When the Contract involves work on or in the vicinity of utility-owned property or facilities, the utility shall be added along with the County as an Additional Insured on the policy/ies procured pursuant to subsection 7-13.2 above.

7-14 Contractor's Responsibility for Work.

The Contractor will take charge and custody of the Work, and take every necessary precaution against damage to the Work, by the action of the elements, third parties, or from any other cause whatsoever, until the County's final acceptance of the Work. The Contractor will rebuild, repair, restore, and make good all damage to any portion of the Work occasioned by any of the above causes before final acceptance of the Contract.

The County will have no obligation to pay any reimbursement for damage caused by the execution or nonexecution of the Work by the Contractor or its sub-contractors, or damage the Contractor was negligent in preventing.

The County may, at its sole discretion, reimburse the Contractor for the repair of damage to the Work not caused by a third party and due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to Acts of God, of the public enemy, or of governmental authorities.

7-15 Opening Sections of Highway to Traffic.

Whenever any bridge or section of roadway is in acceptable condition for travel, the Director may direct the Contractor to open it to traffic. The County's direction to open a bridge or roadway does not constitute an acceptance of the bridge or roadway, or any part thereof, or waive any Contract provisions. Perform all necessary repairs or renewals, on any section of the roadway or bridge thus opened to traffic under instructions from the Director, due to defective material or work or to any cause other than ordinary wear and tear, pending completion and the Director's acceptance of the roadway or bridge, or other work, at no expense to the County.

7-16 Wage Rates for Federal-Aid Projects (Designated Federal-Aid Contracts Only).

For all projects that include Federal-aid participation, the Special Provisions contain requirements with regard to payment of predetermined minimum wages. Predetermined Wage Rate Decisions (U.S. County of Labor provided Wage Rate Tables) exist for Heavy, Highway, and Building Construction Projects.

7-17 Supplemental Agreements.

Supplemental Agreements (Change Orders) shall be authorized in accordance with Procurement Policies adopted by the Lee County Board of County Commissioners.

7-18 Scales for Weighing Materials.

7-18.1 Applicable Regulations: When determining the weight of material for payment, use scales meeting the requirements of Chapter 531 of Florida Statutes, pertaining to specifications, tolerances, and regulations, as administered by the Bureau of Weights and Measures of the Florida Department of Agriculture.

7-18.2 Base for Scales: Place such scales on a substantial horizontal base to provide adequate support and rigidity and to maintain the level of the scales.

7-18.3 Protection and Maintenance: Maintain all scale parts in proper condition as to level and vertical alignment, and fully protect them against contamination by dust, dirt, and other matter that might affect their operation.

7-19 Source of Forest Products.

As required by Section 255.2575 of the Florida Statutes, where price, fitness and quality are equal, and when available, use only timber, timber piling, or other forest products that are produced and manufactured in the State of Florida. This provision does not apply to Federal-aid projects.

7-20 Regulations of Air Pollution from Asphalt Plants.

7-20.1 General: Perform all work in accordance with all Federal, State, and local laws and regulations regarding air pollution and burning. In particular, pay attention to Chapters 62-210 and 62-256, Rules of the Department of Environmental Protection, Florida Administrative Code, and to any part of the State Implementation Plan applicable to the project. See also 110-9.2 regarding burning of debris.

7-20.2 Dust Control: Control dust during the storage and handling of dusty materials by wetting, covering, or other means as approved by the Director.

7-20.3 Asphalt Material: Use only emulsified asphalt, unless otherwise stated in the Plans and allowed by Chapter 62-210, Rules of the Department of Environmental Protection, Florida Administrative Code. Store and handle asphalt materials and components so as to minimize unnecessary release of hydrocarbon vapors.

7-20.4 Asphalt Plants: Operate and maintain asphalt plants in accordance with Chapter 62-210, Rules of the Department of Environmental Protection, Florida Administrative Code. Provide the plant site with a valid permit as required under Chapter 62-210 prior to start of work.

7-21 Dredging and Filling.

Section 370.033 of the Florida Statutes, requires that all persons, who engage in certain dredge or fill activities in the State of Florida, obtain a certificate of registration from the Florida Department of Environmental Protection, Tallahassee, Florida 32301, and that they keep accurate

logs and records of all such activities for the protection and conservation of the natural resources. Obtain details as to the application of this law from the Department of Environmental Protection.

7-22 Available Funds.

All funds for payment by the County under this Contract are subject to the availability of an annual appropriation for this purpose by the County. In the event of nonappropriation of funds by the County for the work provided under this Contract, the County will terminate the Contract, without termination charge or other liability, on the last day of the then current fiscal year or when the appropriation made for the then-current year for the services covered by this Agreement has been expended, whichever event occurs first. If at any time funds are not appropriated for the continuance of this Agreement, cancellation shall be accepted by the Contractor upon 30 days prior written notice, but failure to give such notice shall be of no effect and the County shall not be obligated under this Contract beyond the date of termination.

7-23 Contractor's Motor Vehicle Registration (Designated State Aid Projects Only).

The Contractor shall provide the County with proof that all motor vehicles operated or caused to be operated by such Contractor are registered in compliance with Chapter 320 of the Florida Statutes. Submit such proof of registration in the form of a notarized affidavit to the County.

The County will not make payment to the Contractor until the required proof of registration is on file with the Department.

If the Contractor fails to register any motor vehicle that he operates in Florida, pursuant to Chapter 320 of the Florida Statutes, the Department may disqualify the Contractor from bidding, or the Department may suspend and revoke the Contractor's certificates of qualification.

7-24 Disadvantaged Business Enterprise Program.

The County encourages the inclusion of Disadvantage Business Enterprise (DBE) participants as defined and certified by FDOT. The Contractor shall submit to the County with the final payment documents a DBE Participation Certification, indicating all DBE Subcontractor(s) and amount(s) utilized for the project. If the Contractor did not utilize the DBE firm(s) listed on the Bid Proposal, a letter of justification shall be submitted along with the DBE Participation Certification.

7-25 On-The-Job Training Requirements (Designated Federal Aid Contracts Only).

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 of trade or job classification involved in the work. In the event the Contractor subcontracts a portion of the contract work, it 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. Ensure that, when feasible, 25% of trainees in each occupation are in their first year of training. The Contractor shall incorporate the requirements of this Section into such subcontract.

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 a 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 275 calendar days.

b. If the Contract Time allowance is 275 calendar days or more, the number of trainees shall be established in accordance with the following chart:

Estimated Contract Amount	Trainees Required
\$2,000,000 or less	0
Over \$2,000,000 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 to *	
*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 CEI Consultant and the Director will attend this meeting. Within ten days after the Post-Preconstruction Training Evaluation Meeting, the Contractor shall submit to the County 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 any of 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 in previously approved classifications; or
3. When replacement trainees are added due to voluntary or involuntary termination

The revised schedule will be resubmitted to and approved by the Director.

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. 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. Credit will be allowed for each trainee that has been previously enrolled in the County's approved training program on another contract and continues training in the same job classification and completes their training on a different contract.

3. Credit will be allowed for each trainee who, due to the amount of work available in their classification, is given the greatest practical amount of training on the contract regardless of whether or not the trainee completes training.

4. Credit will be allowed for any training position indicated in the approved On-The-Job Training Schedule, if the Contractor can demonstrate that a good faith effort to provide training in that classification was made.

5. No credit will be allowed for a trainee whose employment by the Contractor is involuntarily terminated unless the Contractor can clearly demonstrate good cause for this action.

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 the On-The-Job Training Program, 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 a justification for such action acceptable to the County. The Contractor will be given an opportunity and will be responsible for demonstrating the steps that it 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 they have successfully completed a training course leading to journeyman status, or have been employed as a journeyman. The Contractor may 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 as established at the Post-Preconstruction Trainee Evaluation Meeting and approved by the County. Graduation to journeyman status will be based upon satisfactory completion of a 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 Director:

1. Trainee Enrollment and Personnel Action Form
2. Proficiency Demonstration Verification Form indicating completion of each standard established for the classification signed by representatives of both the Contractor and the County.

The County 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 agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of 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 a training schedule shall be obtained from the County 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 County 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 lower level management positions such as office engineers, estimators, etc., where the training is oriented toward construction applications. Training in the laborer classifications, except Common/General Laborer, may be permitted provided that significant and meaningful training is provided and approved by the Director.

When approved in advance by the Director, 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 Director. 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. 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. Credit for offsite training indicated above may only be made to the Contractor when it does one or more of the following and the trainees are concurrently employed on a Federal Aid Project:

1. Contributes to the cost of the training,
2. Provides the instruction to the trainee,
3. Pays the trainee's wages during the offsite training period.

The Contractor shall compensate the trainee at no less than the laborer rate established in the Contract at the onset of training. The compensation rate will be increased to the journeyman's wage

upon graduation from the training program for the remainder of the time the trainee works in the classification in which they were trained.

The Contractor shall furnish the trainee a copy of the program they 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 Director 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 actions occur: 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 Director 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 proficiency.

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

The number of trainees may be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment.

The Contractor will have fulfilled the responsibilities of this Specification when acceptable training has been provided to the trainee as specified above.

7-26 Cargo Preference Act – Use of United States-Flag Vessels (Designated State or Federal Aid Contracts Only).

Pursuant to Title 46 CFR 381, the Contractor agrees

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this Contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph 1 of this Article to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

3. To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this Contract.

SECTION 8 PROSECUTION AND PROGRESS

8-1 Subletting or Assigning of Contracts.

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 prior written consent of the County. If the Contractor chooses to sublet any portion of the Contract, the Contractor must submit a written request to sublet work on Form 6-Subcontractor List contained in the Proposal.

The Contractor shall provide the Director a list of all proposed subcontractors and major material suppliers at the preconstruction conference. A revised list shall be distributed each time a modification thereto is made.

Execute all agreements to sublet work in writing and include all pertinent provisions and requirements of the Contract. All other agreements must be in writing and reference all applicable Contract provisions. Upon request, submit to the County a copy of the subcontract and agreement. The subletting of work does not relieve the Contractor or the surety of their respective liabilities under the Contract.

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

8-2 Reserved.

8-3 Prosecution of Work.

8-3.1 Compliance with Time Requirements: Commence work in accordance with the accepted working schedule and provide sufficient labor, materials and equipment to complete the work within the time limit(s) set forth in the proposal. Should the Contractor fail to furnish sufficient and suitable equipment, forces, and materials, as necessary to prosecute the work in accordance with the required schedule, the Director may withhold all estimates that are, or may become due, or suspend the work until the Contractor corrects such deficiencies.

8-3.2 Submission of Working Schedule: Within 21 calendar days after Contract award or at the preconstruction conference, whichever is earlier, submit to the Director a work progress schedule for the project. The Director will review and respond to the Contractor within 15 calendar days of receipt.

Provide a schedule that shows the various activities of work in sufficient detail to demonstrate a reasonable and workable plan to complete the project within the Contract Time. Show the order and interdependence of activities and the sequence for accomplishing the work. Describe all activities in sufficient detail so that the Director can readily identify the work and measure the progress on of each activity. Show each activity with a beginning work date, a duration, and an ending work date. Include activities for procurement, fabrication, and delivery of materials, plant, and equipment, and review time for shop drawings and submittals. Include milestone activities when milestones are required by the Contract Documents. In a project with more than one phase, adequately identify each phase and its completion date, and do not allow activities to span more than one phase.

Conduct sufficient liaison and provide sufficient information to indicate coordination activities with utility owners that have facilities within the limits of construction requiring adjustment.

Submit a working plan with the schedule, consisting of a concise written description of the construction plan.

The Director will return inadequate schedules to the Contractor for corrections. Resubmit a corrected schedule within 15 calendar days from the date of the Director's return transmittal.

Submit an updated Work Progress Schedule, for Director's acceptance, with each application for payment. The Director will review the updated schedule and respond within 7 calendar days of receipt.

By acceptance of the schedule, the Director does not endorse or otherwise certify the validity or accuracy of the activity durations or sequencing of activities. The Director will use the accepted schedule as the baseline against which to measure the progress.

If the Contractor fails to finalize either the initial or a revised schedule in the time specified, the Director will withhold all Contract payments until the Director accepts the schedule.

8-3.3 Beginning Work: Do not commence work under the Contract until after the County has issued a written Notice to Proceed. The Contract Time shall commence to run from the date specified in the Notice to Proceed. Issuance of the Notice to Proceed is contingent upon and will be done subsequent to the Contractor fully satisfying the County's stated insurance and bond submittal requirements. Until the Contractor receives the Department's Notice to Proceed, the Contractor is advised that the County will not be liable for any expenses which the Contractor may incur relative to the Contract before the written Notice to Proceed is issued.

8-3.4 Provisions for Convenience of Public: Schedule construction operations so as to minimize any inconvenience to adjacent businesses or residences. Where necessary, the Director may require the Contractor to first construct the work in any areas along the project where inconveniences caused by construction operations would present a more serious handicap. In such critical locations, where there is no assurance of continuous effective prosecution of the work once the construction operations are begun, the Director may require the Contractor to delay removal of the existing (usable) facilities.

8-3.5 Preconstruction Conference: County After the award of the Contract but prior to the issuance of the written Notice-to-Proceed, a conference will be held to establish lines of communication; procedures for handling shop drawings, requests for information, applications for payment, and other submissions; and to establish a working understanding between the parties as to the Contractor's project management responsibilities.

Present at the conference will be the Contractor and his subcontractors, utility companies, CEI Consultant and the Director. The time and place of this conference will be set by the Director. The Contractor shall be represented at the conference by a person duly authorized to speak on behalf of and represent the Contractor, together with all of the Contractor's supervisory personnel who will be assigned to the project. The Contractor shall submit the following minimum information to the Director for his review and approval on or prior to the date established for the pre-construction conference:

- a. Name of the Contractor's proposed project manager.
- b. Name of the Contractor's proposed full-time superintendent.
- c. Name of the Contractor's representative for implementing and maintaining the Maintenance of Traffic Plan during construction.
- d. Personnel qualifications as may be requested by the County.

- e. Listing/qualifications of the Contractor's proposed subcontractors.
- f. Project Schedule.
- g. Traffic Control Plan/Maintenance of Traffic Plan.
- h. Applicable quality control plan(s).
- i. Name/qualifications of Contractor's Registered Professional Surveyor and Mapper in responsible charge of project layout.
- j. Name/qualifications of Contractor's quality control technician.
- k. Schedule and plan for prevention, control and abatement of erosion and water pollution per Section 104-5 of the Standard Specifications.

8-3.6 Progress Meetings: The Contractor shall attend regular progress meetings with and between the County's field representatives and those of the Contractor, subcontractors, utility companies, CEI Consultant and other parties having an interest in the Contract. The progress meetings shall be hosted by the County and shall be held at locations to be mutually agreed upon by the County and the Contractor at no less than two week intervals. The purpose of such meetings shall include, but not to be limited to, discussing all general aspects of the project and specifically addressing problem areas, schedules, progress payments, etc. The CEI Consultant shall be responsible for the preparation and distribution of the minutes.

8-4 Limitations of Operations.

8-4.1 Night Work: During active nighttime operations, furnish, place and maintain lighting sufficient to permit proper workmanship and inspection. Use lighting with 5 ft-cd minimum intensity. Arrange the lighting to prevent interference with traffic or produce undue glare to property owners. Operate such lighting only during active nighttime construction activities. Provide a light meter to demonstrate that the minimum light intensity is being maintained.

Lighting may be accomplished by the use of portable floodlights, standard equipment lights, existing street lights, temporary street lights, or other lighting methods approved by the Director.

Submit a lighting plan at the Preconstruction Conference for review and acceptance by the Director. Submit the plan as a PDF file, in the same scale as the Contract Plans, and formatted on 11 inch by 17 inch sheets. Do not start night work prior to the Director's acceptance of the lighting plan.

During active nighttime operations, furnish, place and maintain variable message signs to alert approaching motorists of lighted construction zones ahead. Operate the variable message signs only during active construction activities.

Include compensation for lighting for night work in the Contract prices for the various items of the Contract. Take ownership of all lighting equipment for night work.

8-4.1.1 Holiday and Weekend Work: If work is authorized by the Director on holidays, weekends, or nights the Contractor shall notify the Director 72 hours in advance of the time and date on which the Contractor or any of his subcontractors propose to perform work during such time periods to afford the Director ample time to effectively schedule his inspection personnel in accordance with the Contractor's timetable.

8-4.2 Sequence of Operations: Do not open up work to the prejudice of work already started. The Director may require the Contractor to finish a section on which work is in progress before starting work on any additional section. Specific requirements pertaining to the sequence

of operations for constructing the project and maintaining traffic shall be included in the Contractor's work progress schedule.

8-4.3 Interference with Traffic: At all times conduct the work in such manner and in such sequence as to ensure the least practicable interference with traffic. Operate all vehicles and other equipment safely and without hindrance to the traveling public. Park all private vehicles outside the clear zone. Place materials stored along the roadway so as to cause no obstruction to the traveling public as possible.

Where existing pavement is to be widened and stabilizing is not required, prevent any open trench from remaining after working hours by scheduling operations to place the full thickness of widened base by the end of each day. Do not construct widening strips simultaneously on both sides of the road, except where separated by a distance of at least 1/4 mile along the road and where either the work of excavation has not been started or the base has been completed.

8-4.4 Coordination with other Contractors: Sequence the work and dispose of materials so as not to interfere with the operations of other Contractors engaged upon adjacent work; join the work to that of others in a proper manner, in accordance with the spirit of the Contract Documents; and perform the work in the proper sequence in relation to that of other contractors; all as may be directed by the Director.

Each contractor is responsible for any damage done by him or his agents to the work performed by another contractor.

8-4.5 Drainage: Conduct the operations and maintain the work in such condition to provide adequate drainage at all times. Do not obstruct existing functioning storm sewers, gutters, ditches, and other run-off facilities. Maintain all existing storm sewers, gutters, ditches, and other run-off facilities in an operable condition as necessary to provide adequate drainage at all times.

8-4.6 Fire Hydrants: Keep fire hydrants on or adjacent to the highway accessible to fire apparatus at all times, and do not place any material or obstruction within 15 feet of any fire hydrant.

8-4.7 Protection of Structures: Do not operate heavy equipment close enough to pipe headwalls or other structures to cause their displacement.

8-4.8 Fencing: Erect permanent fence as a first order of business on all projects that include fencing where the Director determines that the fencing is necessary to maintain the security of livestock on adjacent property, or for protection of pedestrians who are likely to gain access to the project from adjacent property.

8-4.9 Contaminated Materials: When the construction operations encounter or expose any abnormal condition that may indicate the presence of a contaminated material, discontinue such operations in the vicinity of the abnormal condition and notify the Director immediately. Be alert for the presence of tanks or barrels; discolored or stained earth, metal, wood, ground water; visible fumes; abnormal odors; excessively hot earth; smoke; or other conditions that appear abnormal as possible indicators of the presence of contaminated materials. Treat these conditions with extraordinary caution.

Make every effort to minimize the spread of any contaminated materials into uncontaminated areas.

Do not resume the construction operations in the vicinity of the abnormal conditions until so directed by the Director.

Dispose of the contaminated material in accordance with the requirements and regulations of any Local, State, or Federal agency having jurisdiction. Where the Contractor performs work necessary to dispose of contaminated material, and the Contract does not include pay items for disposal, the County will pay for this work as provided in 4-4.

The County agrees to hold harmless and indemnify the Contractor for damages when the Contractor discovers or encounters contaminated materials or pollutants during the performance of services for the County when the presence of such materials or pollutants were unknown or not reasonably discoverable. Such indemnification agreement is only effective if the Contractor immediately stops work and notifies the County of the contaminated material or pollutant problem.

Such indemnification agreement is not valid for damages resulting from the Contractor's willful, wanton, or intentional conduct or the operations of Contaminated and Hazardous Material Contractors.

8-5 Qualifications of Contractor's Personnel.

Provide competent, careful, and reliable superintendents, foremen, and workmen. Provide workmen with sufficient skill and experience to properly perform the work assigned to them. Provide workmen engaged on special work, or skilled work, such as bituminous courses or mixtures, concrete bases, pavements, or structures, or in any trade, with sufficient experience in such work to perform it properly and satisfactorily and to operate the equipment involved. Provide workmen that shall make due and proper effort to execute the work in the manner prescribed in the Contract Documents, or the Director may take action as prescribed below.

The Contractor shall assign a full-time superintendent to routinely and constantly supervise, manage, plan, monitor, schedule, and control the construction operations on behalf of the Contractor. Trade workers will not be considered to be a full-time superintendent. The Contractor's superintendent shall be present on the project at all times when the Contractor's work crews, or work crews of other parties authorized by the Director, are engaged in any activity whatsoever associated with the project. Should the Contractor fail to comply with the above condition, the Director may, at his discretion, deduct from the Contractor's partial monthly payment estimate, the amount of \$250 per hour for each hour lacking adequate superintendence. This deduction is to account for the County's loss of adequate supervision, not as a penalty, but as liquidated damages for services not rendered.

It is prohibited as a conflict of interest for a Contractor to subcontract with a Consultant to perform Contractor Quality Control when the Consultant is under contract with the County to perform work on any project described in the Contractor's Contract with the County. Prior to approving a Consultant for Contractor Quality Control, the Contractor shall submit to the County a Certificate from the proposed Consultant certifying that no conflict of interest exists.

Whenever the Director determines that any person employed by the Contractor is incompetent, unfaithful, intemperate, disorderly, or insubordinate, the Director will provide written notice and the Contractor shall discharge the person from the work. Do not employ any discharged person on the project without the written consent of the Director. If the Contractor fails to remove such person or persons, the Director may withhold all estimates that are or may become due, or suspend the work until the Contractor complies with such orders. Protect, defend, indemnify, and hold the County, its agents, officials, and employees harmless from all claims, actions, or suite arising from such removal, discharge, or suspension of employees.

8-6 Temporary Suspension of Contractor's Operations.

8-6.1 Authority to Suspend Contractor's Operations: The Director has the authority to suspend the Contractor's operations, wholly or in part. The Director will order such suspension in writing, giving in detail the reasons for the suspension. Contract Time will be charged during all suspensions of Contractor's operations. The County may grant an extension of Contract Time in accordance with 8-7.3.2 when determined appropriate in the County's sole judgment.

No additional compensation or time extension will be paid or granted to the Contractor when the operations are suspended for the following reasons:

1. The Contractor fails to comply with the Contract Documents.
2. The Contractor fails to carry out orders given by the Director.
3. The Contractor causes conditions considered unfavorable for continuing

the Work.

Immediately comply with any suspension order. Do not resume operations until authorized to do so by the Director in writing. Any operations performed by the Contractor, and otherwise constructed in conformance with the provisions of the Contract, after the issuance of the suspension order and prior to the Director's authorization to resume operations will be at no cost to the County. Further, failure to immediately comply with any suspension order will also constitute an act of default by the Contractor and is deemed sufficient basis in and of itself for the County to declare the Contractor in default, in accordance with 8-9, with the exception that the Contractor will not have ten calendar days to correct the conditions for which the suspension was ordered.

8-6.1.1 State of Emergency: The Director has the authority to suspend the Contractor's operations, wholly or in part, pursuant to a Governor's Declaration of a State of Emergency. The Director will order such suspension in writing, giving in detail the reasons for the suspension. Contract Time will be charged during all suspensions of Contractor's operations. The County, at its sole discretion, may grant an extension of Contract Time and reimburse the Contractor for specific costs associated with such suspension. Further, in such instances, the County's determination as to entitlement to either time or compensability will be final, unless the Contractor can prove by clear and convincing evidence to a Disputes Review Board that the County's determination was without any reasonable factual basis

8-6.2 Prolonged Suspensions: If the Director suspends the Contractor's operations for an indefinite period, store all materials in such manner that they will not obstruct or impede the traveling public unnecessarily or become damaged in any way. Take every reasonable precaution to prevent damage to or deterioration of the work performed. Provide suitable drainage of the roadway by opening ditches, shoulder drains, etc., and provide any temporary structures necessary for public travel through the project.

8-6.3 Permission to Suspend Contractor's Operations: Do not suspend operations or remove equipment or materials necessary for completing the work without obtaining the Director's written permission. Submit all requests for suspension of operations in writing to the Director, and identify specific dates to begin and end the suspension. The Contractor is not entitled to any additional compensation for suspension of operations during such periods.

8-6.4 Suspension of Contractor's Operations - Holidays and Special Events: Unless the Contractor submits a written request to work during one or more days of a Holiday or Special Event at least ten calendar days in advance of the beginning date of the Holiday or Special Event and receives written approval from the Director, the Contractor shall not work on the following days: Martin Luther King, Jr. Day; Memorial Day; the Saturday and Sunday immediately

preceding Memorial Day; Independence Day; Independence Day (Observed); Labor Day; the Friday, Saturday, and Sunday immediately preceding Labor Day; Veterans Day; Veterans Day (Observed); the Wednesday immediately preceding Thanksgiving Day; Thanksgiving Day; the Friday, Saturday and Sunday immediately following Thanksgiving Day; December 24 through January 2, inclusive; and Special Events noted in the Plans. Contract Time will be charged during these Holiday and Special Event periods. Contract Time will be adjusted in accordance with 8-7.3.2. The Contractor is not entitled to any additional compensation beyond any allowed Contract Time adjustment for suspension of operations during such Holiday and Special Event periods.

During such suspensions, remove all equipment and materials from the clear zone, except those required for the safety of the traveling public and retain sufficient personnel at the job site to properly meet the requirements of Sections 102 and 104. The Contractor is not entitled to any additional compensation for removal of equipment from clear zones or for compliance with Section 102 and Section 104 during such Holiday and Special Event periods.

8-7 Computation of Contract Time.

8-7.1 General: Perform the contracted work fully, entirely, and in accordance with the Contract Documents within the Contract Time specified in the proposal, or as may be extended in accordance with the provisions herein below.

The County considers in the computation of the Contract Time the effect that utility relocation and adjustments have on job progress and the scheduling of construction operations required in order to adequately maintain traffic, as detailed in the Plans or as scheduled in the Special Provisions.

8-7.2 Date of Beginning of Contract Time: The date on which Contract Time begins is either the date on which the Contractor actually begins work, or the date for beginning the charging of Contract Time as set forth in the proposal; whichever is earlier.

8-7.3 Adjusting Contract Time:

8-7.3.1 Increased Work: The County may grant an extension of Contract Time when it increases the Contract amount due to overruns in original Contract items, adds new work items, or provides for unforeseen work. The County will base the consideration for granting an extension of Contract Time on the extent that the time normally required to complete the additional designated work delays the Contract completion schedule.

8-7.3.2 Contract Time Extensions: The County may grant an extension of Contract Time when a controlling item of work is delayed by factors not reasonably anticipated or foreseeable at the time of bid. The County may allow such extension of time only for delays occurring during the Contract Time period or authorized extensions of the Contract Time period. When failure by the County to fulfill an obligation under the Contract results in delays to the controlling items of work, the County will consider such delays as a basis for granting a time extension to the Contract.

Whenever the Director suspends the Contractor's operations, as provided in 8-6, for reasons other than the fault of the Contractor, the Director will grant a time extension for any delay to a controlling item of work due to such suspension. The County will not grant time extensions to the Contract for delays due to the fault or negligence of the Contractor.

The County does not include an allowance for delays caused by the effects of inclement weather or suspension of Contractor's operations as defined in 8-6.4, in establishing Contract Time. The Director will continually monitor the effects of weather and, when found

justified, grant time extensions on either a bimonthly or monthly basis. The Director will not require the Contractor to submit a request for additional time due to the effects of weather.

The County will grant time extensions, on a day for day basis, for delays caused by the effects of rains or other inclement weather conditions, related adverse soil conditions or suspension of operations as defined in 8-6.4 that prevent the Contractor from productively performing controlling items of work resulting in:

1. The Contractor being unable to work at least 50% of the normal work day on pre-determined controlling work items; or

2. The Contractor must make major repairs to work damaged by weather, provided that the damage is not attributable to the Contractor's failure to perform or neglect; and provided that the Contractor was unable to work at least 50% of the normal workday on pre-determined controlling work items.

No additional compensation will be made for delays caused by the effects of inclement weather.

The County will consider the delays in delivery of materials or component equipment that affect progress on a controlling item of work as a basis for granting a time extension if such delays are beyond the control of the Contractor or supplier. Such delays may include an area-wide shortage, an industry-wide strike, or a natural disaster that affects all feasible sources of supply. In such cases, the Contractor shall submit substantiating letters from a representative number of manufacturers of such materials or equipment clearly confirming that the delays in delivery were the result of an area-wide shortage, an industry-wide strike, etc. No additional compensation will be made for delays caused by delivery of materials or component equipment.

The County will not consider requests for time extension due to delay in the delivery of custom manufactured equipment such as traffic signal equipment, highway lighting equipment, etc., unless the Contractor submits documentation that he placed the order for such equipment in a timely manner, the delay was caused by factors beyond the manufacturer's control, and the lack of such equipment caused a delay in progress on a controlling item of work. No additional compensation will be paid for delays caused by delivery of custom manufactured equipment.

The County will consider the effect of utility relocation and adjustment work on job progress as the basis for granting a time extension only if all the following criteria are met:

1. Delays are the result of either utility work that was not detailed in the Plans, or utility work that was detailed in the Plans but was not accomplished in reasonably close accordance with the schedule included in the Contract Documents.

2. Utility work actually affected progress toward completion of controlling work items.

3. The Contractor took all reasonable measures to minimize the effect of utility work on job progress, including cooperative scheduling of the Contractor's operations with the scheduled utility work at the preconstruction conference and providing adequate advance notification to utility companies as to the dates to coordinate their operations with the Contractor's operations to avoid delays.

As a condition precedent to an extension of Contract Time the Contractor must submit to the Director:

A preliminary request for an extension of Contract Time must be submitted in writing to the Director within ten calendar days after the commencement of a delay to a controlling item of work. If the Contractor fails to submit this required preliminary request for an extension of Contract Time, the Contractor fully, completely, absolutely and irrevocably waives any entitlement to an extension of Contract Time for that delay. In the case of a continuing delay only a single preliminary request for an extension of Contract Time will be required. Each such preliminary request for an extension of Contract Time shall include as a minimum the commencement date of the delay, the cause of the delay, and the controlling item of work affected by the delay.

Furthermore, the Contractor must submit to the Director a request for a Contract Time extension in writing within 30 days after the elimination of the delay to the controlling item of work identified in the preliminary request for an extension of Contract Time. Each request for a Contract Time extension shall include as a minimum all documentation that the Contractor wishes the County to consider related to the delay, and the exact number of days requested to be added to Contract Time. If the Contractor contends that the delay is compensable, then the Contractor shall also be required to submit with the request for a Contract Time extension a detailed cost analysis of the requested additional compensation. If the Contractor fails to submit this required request for a Contract Time extension, with or without a detailed cost analysis, depriving the Director of the timely opportunity to verify the delay and the costs of the delay, the Contractor waives any entitlement to an extension of Contract Time or additional compensation for the delay.

Upon timely receipt of the preliminary request of Contract Time from the Contractor, the Director will investigate the conditions, and if it is determined that a controlling item of work is being delayed for reasons beyond the control of the Contractor the Director will take appropriate action to mitigate the delay and the costs of the delay. Upon timely receipt of the request for a Contract Time extension the Director will further investigate the conditions, and if it is determined that there was an increase in the time or the cost of performance of the controlling item of work beyond the control of the Contractor, then an adjustment of Contract Time will be made, and a monetary adjustment will be made, excluding loss of anticipated profits, and the Contract will be modified in writing accordingly.

The existence of an accepted schedule, including any required update(s), as stated in 8-3.2, is a condition precedent to the Contractor having any right to the granting of an extension of Contract Time or any monetary compensation arising out of any delay. Contractor failure to have an accepted schedule, including any required update(s), for the period of potential impact, or in the event the currently accepted schedule and applicable updates do not accurately reflect the actual status of the project or fail to accurately show the true controlling or non-controlling work activities for the period of potential impact, will result in any entitlement determination as to time or money for such period of potential impact being limited solely to the County's analysis and identification of the actual controlling or non-controlling work activities. Further, in such instances, the County's determination as to entitlement as to either time or compensability will be final, unless the Contractor can prove by clear and convincing evidence to a Disputes Review Board that the County's determination was without any reasonable factual basis.

8-8 Reserved

8-9 Default and Termination of Contract.

8-9.1 Determination of Default: The following acts or omissions constitute acts of default and, except as to subparagraphs 9 and 11, the County will give notice, in writing, to the Contractor and his surety for any delay, neglect or default, if the Contractor:

1. fails to begin the work under the Contract within the time specified in the Notice to Proceed;
2. fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure prompt completion of the Contract;
3. performs the work unsuitably, or neglects or refuses to remove materials or to perform anew such work that the Director rejects as unacceptable and unsuitable;
4. discontinues the prosecution of the work, or fails to resume discontinued work within a reasonable time after the Director notifies the Contractor to do so;
5. becomes insolvent or is declared bankrupt, or files for reorganization under the bankruptcy code, or commits any act of bankruptcy or insolvency, either voluntarily or involuntarily;
6. allows any final judgment to stand against him unsatisfied for a period of ten calendar days;
7. makes an assignment for the benefit of creditors;
8. fails to comply with Contract requirements regarding minimum wage payments or EEO requirements;
9. fails to comply with the Director's written suspension of work order within the time allowed for compliance and which time is stated in that suspension of work order; or
10. for any other cause whatsoever, fails to carry on the work in an acceptable manner, or if the surety executing the bond, for any reasonable cause, becomes unsatisfactory in the opinion of the County.
11. fails to comply with 3-9.

For a notice based upon reasons stated in subparagraphs (1) through (8) and (10): if the Contractor, within a period of ten calendar days after receiving the notice described above, fails to correct the conditions of which complaint is made, the County will, upon written certificate from the Director of the fact of such delay, neglect, or default and the Contractor's failure to correct such conditions, have full power and authority, without violating the Contract, to take the prosecution of the work out of the hands of the Contractor and to declare the Contractor in default.

If the Contractor, after having received a prior notice described above for any reason stated in subparagraph (2), (3), (4), (5), (6) or (8), commits a second or subsequent act of default for any reason covered by the same subparagraph (2), (3), (4), (5), (6) or (8) as stated in the prior notice, and regardless whether the specific reason is the same, then, regardless of whether the Contractor has cured the deficiency stated in that prior notice, the County will, upon written certificate from the Director of the fact of such delay, neglect or default and the Contractor's failure to correct such conditions, have full power and authority, without any prior written notice to the Contractor and without violating the Contract, to take the prosecution of the work out of the hands of the Contractor and to declare the Contractor in default.

Regarding subparagraph (9), if the Contractor fails to comply with the Director's written suspension of work order within the time allowed for compliance and which time is stated in that suspension of work order, the County will, upon written certificate from the

Director of the fact of such delay and the Contractor's failure to correct that condition, have full power and authority, without violating the Contract, to immediately take the prosecution of the work out of the hands of the Contractor and to declare the Contractor in default.

Regarding subparagraph (11), if the Contractor fails to comply with 3-9, the County will have full power and authority, without violating the Contract, to immediately take the prosecution of the work out of the hands of the Contractor and to declare the Contractor in default.

The County has no liability for anticipated profits for unfinished work on a Contract that the County has determined to be in default.

Notwithstanding the above, the County shall have the right to declare the Contractor (or its "affiliate") in default and immediately terminate this Contract, without any prior notice to the Contractor, in the event the Contractor (or its "affiliate") is at any time "convicted" of a "contract crime," as these terms are defined in Section 337.165(1), Florida Statutes. The County's right to default the Contractor (or its "affiliate") for "conviction" of a "contract crime" shall extend to and is expressly applicable to any and all County Contracts that were either advertised for bid; for which requests for proposals or letters of interest were requested; for which an intent to award was posted or otherwise issued; or for which a Contract was entered into, after the date that the underlying or related criminal indictment, criminal information or other criminal charge was filed against the Contractor (or its "affiliate") that resulted in the "conviction." In the event the County terminates this Contract for this reason, the Contractor shall hereby forfeit any claims for additional compensation, extra time, or anticipated profits. The Contractor shall only be paid for any completed work up to the date of termination. Further, the Contractor shall be liable for any and all additional costs and expenses the County incurs in completing the Contract work after such termination.

8-9.2 Termination of Contract for Convenience: The County may terminate the entire Contract or any portion thereof, if the Director determines that a termination is in the County's interest. The Director will deliver to the Contractor a Written Notice of Termination specifying the extent of termination and the effective date.

When the County terminates the entire Contract, or any portion thereof, before the Contractor completes all items of work in the Contract, the County will make payment for the actual number of units or items of work that the Contractor has completed, at the Contract unit price, and according to the formulas and provisions set forth in 4-3.2 for items of work partially completed, and such payments will constitute full and complete compensation for such work or items. No payment of any kind or amount will be made for items of work not started. The County will not consider any claim for loss of anticipated profits, or overhead of any kind (including home office and jobsite overhead or other indirect impacts) except as provided in 4-3.2 for partially completed work.

The County will consider reimbursing the Contractor for actual cost of mobilization (when not otherwise included in the Contract) including moving equipment to the job where the volume of the work that the Contractor has completed is too small to compensate the Contractor for these expenses under the Contract unit prices.

The County may purchase at actual cost acceptable materials and supplies procured for the work, that the County has inspected, tested, and approved and that the Contractor has not incorporated in the work. Submit the proof of actual cost, as shown by receipted bills and actual cost records, at such points of delivery as the Director may designate.

Termination of a contract or a portion thereof, under the provisions of this Subarticle, does not relieve the Contractor or the surety of its responsibilities for the completed portion of the Contract or its obligations for and concerning any just claims arising out of the work performed.

All Contractor claims for additional payment, due to the County's termination of the entire Contract or any portion thereof, must meet the requirements of 5-12.

8-9.3 Completion of Work by County: Upon declaration of default, the County will have full authority to appropriate or use any or all suitable and acceptable materials and equipment on the site and may enter into an agreement with others to complete the work under the Contract, or may use other methods to complete the work in an acceptable manner. The County will charge all costs that the County incurs because of the Contractor's default, including the costs of completing the work under the Contract, against the Contractor. If the County incurs such costs in an amount that exceeds the sum that would have been payable under the Contract, then the Contractor and the surety shall be liable and shall pay the County the amount of the excess.

If, after the ten day notice period and prior to any action by the County to otherwise complete the work under the Contract, the Contractor establishes his intent to prosecute the work in accordance with the County's requirements, then the County may allow the Contractor to resume the work, in which case the County will deduct from any monies due or that may become due under the Contract, any costs to the County incurred by the delay, or from any reason attributable to the delay.

8-10 Liquidated Damages for Failure to Complete the Work.

8-10.1 Reserved.

8-10.2 Amount of Liquidated Damages: Applicable liquidated damages are the amounts established in the following schedule:

Original Contract Amount	Daily Charge Per Calendar Day
\$50,000 and under.....	\$956
Over \$50,000 but less than \$250,000.....	\$964
\$250,000 but less than \$500,000.....	\$1,241
\$500,000 but less than \$2,500,000.....	\$1,665
\$2,500,000 but less than \$5,000,000.....	\$2,712
\$5,000,000 but less than \$10,000,000.....	\$3,447
\$10,000,000 but less than \$15,000,000.....	\$4,866
\$15,000,000 but less than \$20,000,000.....	\$5,818
\$20,000,000 and over.....	\$9,198 plus 0.00005 of any amount over \$20 million (Round to nearest whole dollar)

8-10.3 Determination of Number of Days of Default: For all contracts, regardless of whether the Contract Time is stipulated in calendar days or working days, the Director will count default days in calendar days.

8-10.4 Conditions under which Liquidated Damages are Imposed: 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 County may have granted then the Contractor or, in case of his default, the surety shall pay to the County, not as a penalty, but as liquidated damages, the amount so due as determined in 8-10.2.

8-10.5 Right of Collection: The County has the right to apply, as payment on such liquidated damages, any money the County owes the Contractor.

8-10.6 Allowing Contractor to Finish Work: The County does not waive its right to liquidated damages due under the Contract by allowing the Contractor to continue and to finish the work, or any part of it, after the expiration of the Contract Time.

8-10.7 Completion of Work by County: In the case of a default of the Contract and the completion of the work by the County, the Contractor and his surety are liable for the liquidated damages under the Contract, but the County will not charge liquidated damages for any delay in the final completion of the County's performance of the work due to any unreasonable action or delay on the part of the County.

8-11 Release of Contractor's Responsibility.

The County considers the Contract complete when the Contractor has completed all work and the County has accepted the work. The County will then release the Contractor from further obligation except as set forth in his bond, and except as provided in 5-13.

8-12 Recovery of Damages Suffered by Third Parties.

In addition to the damages provided for in 8-10.2 and pursuant to Section 337.18 of the Florida Statutes, when the Contractor fails to complete the work within the Contract Time the County may recover from the Contractor amounts that the County pays for damages suffered by third parties unless the failure to timely complete the work was caused by the County's act or omission.

SECTION 9 MEASUREMENT AND PAYMENT

9-1 Measurement of Quantities.

9-1.1 Measurement Standards: The Director will measure all work completed under the Contract in accordance with the United States Standard Measures.

9-1.2 Method of Measurements: The Director will take all measurements horizontally or vertically.

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 Director will use lengths and widths in the calculations based on the station to station dimensions shown in the Plans; the station to station dimensions actually constructed within the limits designated by the Director; or the final dimensions measured along the surface of the completed work within the neat lines shown in the Plans or designated by the Director. The Director 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 Director 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 Director will determine the final pay quantity based on the plan quantity subject to the provisions of 9-3.2. Generally, the Director will calculate the plan quantity using lengths based on station to station dimensions and widths based on neat lines shown in the Plans.

9-1.4 Construction Outside Authorized Limits: The Director will not pay for surfaces constructed over a greater area than authorized, or for material that the Contractor has moved from outside of slope stakes and lines shown in the Plans, except where the Director provides written instruction for the Contractor to perform such work.

9-1.5 Truck Requirements: Provide all trucks with numbers and certify that all trucks used have a manufacturer's certification or permanent decal showing the truck capacity rounded to the nearest tenth of a cubic yard placed on both sides of the truck. This capacity will include the truck body only and any side boards added will not be included in the certified truck body capacity. Ensure the lettering and numbers are legible for identification purposes at all times.

9-1.6 Ladders and Instrument Stands for Bridge Projects: On bridge projects, in order to facilitate necessary measurements, provide substantial ladders to the tops of piers and bents, and place and move such ladders as the Director directs.

For bridge projects crossing water or marshy areas, supply fixed stands for instrument mounting and measurements, in accordance with the details stipulated in the Specifications for the project.

9-2 Scope of Payments.

9-2.1 Items Included in Payment: Accept the compensation as provided in the Contract as full payment for furnishing all materials and for performing all work contemplated and embraced under the Contract; also for all loss or damage arising out of the nature of the work or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its final acceptance; also for all other costs incurred under the provisions of Division I.

For any item of work contained in the proposal, except as might be specifically provided otherwise in the basis of payment clause for the item, include in the Contract unit price (or lump sum price) for the pay item or items the cost of all labor, equipment, materials, tools and incidentals required for the complete item of work, including all requirements of the Section specifying such item of work, except as specifically excluded from such payments.

9-2.1.1 Reserved

9-2.1.2 Bituminous Material: Prepare a Contractor's Certification of Quantities, using the FDOT's current approved form for Superpave Asphalt Base, Turnout Construction (Asphalt), Asphalt Treated Permeable Base, Superpave Asphaltic Concrete, Miscellaneous Asphalt Pavement, Asphalt Concrete Friction Course, and Asphalt Rubber Membrane Interlayer pay items. Submit this certification to the Director no later than Twelve O'clock noon Monday after the estimate cut-off or as directed by the Director, based on the quantity of asphalt produced and accepted on the roadway per Contract. Ensure the certification includes the Project Number, Contract Number, Financial Project Identification (FPID) Number (if applicable), Certification Date and Number, the period the certification represents and the tons produced for each asphalt pay item.

On Contracts having an original Contract Time of more than 365 calendar days, or more than 5,000 tons of asphalt concrete, the County will adjust the bid unit price for bituminous material, excluding cutback and emulsified asphalt to reflect increases or decreases in the Asphalt Price Index (API) of bituminous material from that in effect during the month in which bids were received. The Contractor will not be given the option of accepting or rejecting this adjustment. Bituminous adjustments will be made only when the current API (CAPI) varies by more than 5% of the API prevailing in the month when bids were received (BAPI), and then only on the portion that exceeds 5%.

The County will determine the API for each month by averaging quotations in effect on the first day of the month at all terminals that could reasonably be expected to furnish bituminous material to projects in the State of Florida.

The API will be available on the Construction Office website before the 15th day of each month at the following URL: <http://www.fdot.gov/construction/fuel&Bit/Fuel&Bit.shtm>.

Payment on progress estimates will be adjusted to reflect adjustments in the prices for bituminous materials in accordance with the following:

$$\text{\$ Adjustment} = (\text{ID})(\text{Gallons})$$

Where ID = Index Difference = [CAPI - 0.95(BAPI)] when the API has decreased between the month of bid and month of this progress estimate.

Where ID = Index Difference = [CAPI - 1.05(BAPI)] when the API has increased between the month of bid and month of this progress estimate.

Payment will be made on the current progress estimate to reflect the index difference at the time work was performed.

For asphalt concrete items payable by the ton or square yard, the number of gallons will be determined assuming a mix design with 6.25% liquid asphalt weighing 8.58 pounds per gallon.

For asphalt concrete items payable by the cubic yard, the number of gallons will be determined assuming a mix design with 3% liquid asphalt weighing 8.58 pounds per gallon.

9-2.2 Non-Duplication of Payment: In cases where the basis of payment clause in these Specifications relating to any unit price in the bid schedule requires that the unit price cover and be considered compensation for certain work or material essential to the item, the County will not measure or pay for this same work or material under any other pay item that may appear elsewhere in these Specifications.

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 (1) or (2) below:

1. a difference between the original plan quantity and final quantity of more than 5%,
2. 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 County will revise such quantity only in the event that the County determines it is in substantial error. In general, the County 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 County 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 County 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 County, 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 County 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 County will revise the plan quantity accordingly. In general, the County 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 County 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 County designates the pay quantity for an item to be a lump sum and the Plans show an estimated quantity, the County will adjust the lump sum compensation only in the event that either the Contractor submits satisfactory evidence or the County determines and furnishes satisfactory evidence that the lump sum quantity shown is in substantial error as defined in 9-3.2.1.

9-3.3.2 Authorized Changes in Work: Where the County designates the pay quantity for an item to be a lump sum and the Plans show an estimated quantity, the County will adjust compensation for that item proportionately when an authorized plan change is made which results in an increase or decrease in the quantity of that item. When the Plans do not show an estimated plan quantity or the applicable specifications do not provide adjustments for contingencies, the County will compensate for any authorized plan change resulting in an increase or decrease in the cost of acceptably completing the item by establishing a new unit price through a supplemental agreement as provided in 4-3.2.

9-3.4 Deviation from Plan Dimensions: If the Contractor fails to construct any item to Plan or to authorized dimensions within the specified tolerances, the Director, at his discretion will: require the Contractor to reconstruct the work to acceptable tolerances at no additional cost to the County; accept the work and provide the Contractor no pay; or accept the work and provide the Contractor a reduced final pay quantity or reduced unit price. The County will not make reductions to final pay quantities for those items designated to be paid on the basis of original plan quantity or a lump sum quantity under the provisions of this Article unless such reduction results in an aggregate monetary change per item of more than \$100, except that for earthwork items, the aggregate change must exceed \$5,000 or 5% of the original plan quantity, whichever is smaller. If, in the opinion of the Director, the Contractor has made a deliberate attempt to take advantage of the construction tolerances as defined in 120-12.1 to increase borrow excavation in fill sections or to decrease the required volume of roadway or lateral ditch excavation or embankment, the County will take appropriate measurements and will apply reductions in pay quantities. The County will not use the construction tolerance, as defined in 120-12.1, as a pay tolerance. The construction tolerance is not to be construed as defining a revised authorized template.

9-4 Deleted Work.

The County will have the right to cancel the portions of the Contract relating to the construction of any acceptable item therein, by making an adjustment in payment to the Contractor of a fair and equitable amount covering the value of all cancelled work less all items of cost incurred prior to the date that the Director cancels the work.

9-5 Partial Payments.

9-5.1 General: The Director will make partial payments on monthly estimates based on the amount of work that the Contractor completes during the month (including delivery of certain materials, as specified herein below). The Director will make approximate monthly payments, and the County will correct all partial estimates and payments in the subsequent estimates and in the final estimate and payment.

The County 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.

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

9-5.1.1 Applications for Payment: On or before the 25th day of each month, the Contractor shall submit six notarized copies of its monthly application for payment to the CEI Consultant for Work performed during the previous month. Each application for payment shall be accompanied by the certifications described in 9-5.6. The County shall not be required to make payment until and unless these certifications are furnished by the Contractor.

Invoices received after the 25th day of each month shall be considered for payment as part of the next month's application. Within ten calendar days of receipt of each application for payment, the CEI Consultant will either:

1. indicate his approval of the requested amount;
2. indicate his approval of only a portion of the requested payment, stating in writing his reasons therefore; or
3. return the application for payment to the Contractor indicating, in writing, the reason for refusing to approve payment and the action necessary to make the payment request proper.

In the event of a total denial and return of the application for payment by the CEI Consultant, the Contractor may make the necessary corrections and resubmit the application for payment. The County shall, within thirty calendar days after County approval of an application for payment, pay the Contractor the amounts so approved. Provided, however, in no event shall the County be obligated to pay any amount greater than that portion of the application for payment approved by the CEI Consultant. Monthly payments to the Contractor shall in no way imply or constitute approval or acceptance of Contractor's Work.

9-5.1.2 Retainage: The County shall initially retain ten percent of the gross amount of each monthly application for payment or ten percent of the portion thereof approved by the CEI Consultant for payment, whichever is less. After 50% of the Contract amount has been earned, the County will reduce the retainage to five percent of each subsequent progress payment. Such sums shall be accumulated and released to the Contractor with final payment.

For purposes of determining when 50% of the Contract amount has been earned, stored materials and mobilization costs will be excluded.

Retainage will be determined for each job on multiple job Contracts. The County 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.

9-5.2 Reserved

9-5.3 Withholding Payment:

9-5.3.1 Withholding Payment for Defective Work: If the County discovers any defective work or material prior to the final acceptance, or if the County has a reasonable doubt as to the integrity of any part of the completed work prior to final acceptance, then the County will not allow payment for such defective or questioned work until the Contractor has remedied the defect and removed any causes of doubt.

9-5.3.2 Withholding Payment for Failure to Comply: The County will withhold progress payments from the Contractor if he fails to comply with any or all of the following, as applicable, within 60 days after beginning work:

1. Comply with and submit required documentation relating to prevailing wage rate provisions, Equal Employment Opportunity, On-The-Job Training, and Affirmative Action;

2. Comply with the requirement to report all necessary information, including actual payments to DBEs, all other subcontractors and major suppliers, through the Internet based Equal Opportunity Reporting System;

3. 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

4. Comply with or make a good faith effort to meet On-The-Job Training goals.

The County will withhold progress payments until the Contractor has satisfied the above conditions.

9-5.3.3 Withholding Payment for Other Reasons: The County may withhold any payments otherwise due Contractor under this Agreement or any other agreement between the County and the Contractor, to such extent as may be necessary in the County's opinion to protect it from loss as a result of:

1. Third party claims filed or reasonable evidence indicating probable filing of such claims;

2. Failure of the Contractor to make payment properly to Subcontractors or for labor, materials, or equipment;

3. Reasonable doubt that the Work can be completed for the unpaid balance of the Contract amount;

4. Reasonable indication that the Work will not be completed within the Contract Time;

5. Unsatisfactory prosecution of the Work by the Contractor;

6. Failure to provide accurate and current red line documents, as-built drawings, or certified surveys;

7. Any other material breach of the Contract Documents.

If these conditions are not remedied or removed, the County may, after three calendar days' written notice, rectify the same at Contractor's expense. The County also may offset against any sums due Contractor the amount of any liquidated or unliquidated obligations of Contractor to the County.

9-5.4 Release of Retainage After Acceptance: When the Contractor has furnished the County with all submittals required by the Contract, such as invoices, DBE Participation Certification, properly executed and notarized Release and Affidavit, duly executed Surety's consent to final payment, EEO reports, materials certifications, certification of materials procured, etc., (excluding Contractor's letter of acceptance of final amount due and Form 21-A

release) and the Director has determined that the measurement and computation of pay quantities is correct, the County may reduce the retainage to two percent of the Contract plus any amount that the County elects to deduct for defective work as provided in 9-5.3.

The County 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 30 days.

The County may deduct from payment estimates any sums that the Contractor owes to the County on any account. Where more than one project or job (separate project number) is included in the Contract, the County 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.

9-5.5 Partial Payments for Delivery of Certain Materials:

9-5.5.1 General: The County 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 submit to the Director 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.

9-5.5.2 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 prestressed 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 price 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 County requires suspension of paving and base construction after the initial paving operations, partial payments will be reinstated until the paving and base construction resumes.

9-5.5.3 Off Site Storage: If the conditions of 9-5.5.1 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 of 9-5.5.1 and the following conditions are met:

1. Furnish the County a Materials Bond stating the supplier guarantees to furnish the material described in the Contract to the Contractor and County. Under this bond, the Obligor shall be the material supplier and the Obligees shall be the Contractor and the Lee County Board of County Commissioners. 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 construction Contract between the Contractor and the supplier of the stockpiled materials:

“Notwithstanding anything to the contrary, <supplier> will be liable to the Contractor and Lee County, Florida County<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 Lee County, Florida County.”

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 Contractor.

9-5.6 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 County 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 County 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 County. 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. Submit this certification in the form designated by the County.

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 County will honor an exception to the above when the Contractor demonstrates good cause for not making any required payment and submits written notification of any such good cause to both the County and the affected subcontractors or suppliers within said 30 day period.

The Contractor shall indemnify and provide defense for the County when called upon to do so for all claims or suits against the County, by third parties, pertaining to Contractor payment or performance issues arising out of the Contract. It is expressly understood that the monetary limitation on the extent of the indemnification shall be the approved Contract amount, which shall be the original Contract amount as may be increased by subsequent Supplemental Agreements.

9-6 Record of Construction Materials.

9-6.1 General: For all construction materials used in the construction of the project, (except materials exempted by 9-6.2), preserve for the County’s inspection the invoices and records of the materials for a period of three years from the date of completion of the project.

Apply this requirement when subcontractors purchase materials, and obtain the invoices and other materials records from the subcontractors. By providing the materials, the Contractor certifies that all invoices will be maintained for the required period.

9-6.2 Non-Commercial Materials: The provisions of 9-6.1 do not apply to materials generally classed as non-commercial, such as fill materials, local sand, sand-clay, or local materials used as stabilizer.

9-7 Disputed Amounts Due the Contractor.

The County reserves the right to withhold from the final estimate any disputed amounts between the Contractor and the County. The County will release all other amounts due, as provided in 9-8.

9-8 Acceptance and Final Payment.

9-8.1 Acceptance and Final Payment Documents: Whenever the Contractor has completely performed the work provided for under the Contract and the Director has performed a final inspection and made final acceptance (as provided in 5-10 and 5-11), and subject to the terms of 8-11, the Director will prepare a final estimate showing the value of the work as soon as the Director makes the necessary measurements and computations. The Director will correct all prior estimates and payments in the final estimate and payment. The County will pay the estimate, less any sums that the County 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.

If the Contractor fails to furnish all required Contract Documents as listed in (1) through (9) below within 90 days of the County's offer of final payment or request for refund of overpayment, the County will not issue Acceptance and remaining retainage will continue to be withheld..

1. The Contractor has agreed in writing to accept the balance due or refund the overpayment, as determined by the County, as full settlement of his account under the Contract and of all claims in connection therewith, or the Contractor, has through the use of the Qualified Acceptance Letter, accepted the balance due or refunded the overpayment, as determined by the County, with the stipulation that his acceptance of such payment or the making of such refund does not constitute any bar, admission, or estoppel, or have any effect as to those payments in dispute or the subject of a pending claim between the Contractor and the County. To receive payment based on a Qualified Acceptance Letter, define in writing the dispute or pending claim with full particular of all items of all issues in dispute, including itemized amounts claimed for all particulars of all items, and submit it as part of the Qualified Acceptance Letter. The Contractor further agrees, by submitting a Qualified Acceptance Letter that any pending or future claim or suit is limited to those particulars, including the itemized amounts, defined in the original Qualified Acceptance Letter, and that he will commence with any such arbitration claim or suit within 820 calendar days from and after the time of final acceptance of the work and that his failure to file a formal claim within this period constitutes his full acceptance of the Director's final estimate and payment. The overpayment refund check from the Contractor, if required, will be considered a part of any Acceptance Letter executed.

2. The Contractor has properly maintained the project, as specified hereinbefore.

3. The Contractor has furnished a sworn affidavit to the effect that the Contractor has paid all bills and no suits are pending (other than those exceptions listed, if any)

in connection with work performed under the Contract and that the Contractor has not offered or made any gift or gratuity to, or made any financial transaction of any nature with, any employee of the County in the performance of the Contract. Include with the listed tort liability exceptions, if any, evidence of adequate insurance coverage as required in 7-13.

4. The surety on the Contract bond consents, by completion of their portion of the affidavit and surety release subsequent to the Contractor's completion of his portion, to final payment to the Contractor and agrees that the making of such payment does not relieve the surety of any of its obligations under the bond.

5. The Contractor has complied with and settled all requirements pertaining to any wage-rate provisions.

6. The Contractor has submitted all required mill tests and analysis reports to the Director.

7. The Contractor has furnished the Construction Compliance with Specifications and Plans Certification. Provide the Director with a notarized final certification of compliance with the requirements of Section 105 to accompany the final estimate. Certification must be on a form provided by the Director.

8. The Contractor has submitted and the County has accepted all as-built drawings and certified surveys.

9. The Contractor has furnished all required manufacturers' warranties to the Director.

9-8.2 Reserved

9-9 Reserved

9-10 Offsetting Payments.

1. After settlement or final adjudication of any claim of the County for work done pursuant to a construction contract with any party, the County may offset such amount from payments due for work done on any construction contract, excluding amounts owed to subcontractors, suppliers, and laborers, which it has with the party owing such amount if, upon demand, payment of the amount is not made within 60 days to the County.

2. Offsetting any amount pursuant to (1) above shall not be considered a breach of Contract by the County.

EXHIBIT H
INSURANCE REQUIREMENTS

CERTIFICATES OF INSURANCE

(1) The Contractor shall obtain and maintain such insurance as will protect it from: (1) claims under workers' compensation laws, disability benefit laws, or other similar employee benefit laws; (2) claims for damages because of bodily injury, occupational sickness or disease or death of its employees including claims insured by usual personal injury liability coverage; (3) claims for damages because of bodily injury, sickness or disease, or death of any person other than its employees including claims insured by usual personal injury liability coverage; and (4) from claims for injury to or destruction of tangible property including loss of use resulting there from -- any or all of which claims may arise out of, or result from, the services, Work and operations carried out pursuant to and under the requirements of the Contract Documents, whether such services, Work and operations be by the Contractor, its employees, or by Subcontractor(s), or anyone employed by or under the supervision of any of them, or for whose acts any of them may be legally liable.

(2) This insurance shall be obtained and written for not less than the limits of liability specified hereinafter, or as required by law, whichever is greater.

(3) The Contractor shall require, and shall be responsible for ensuring throughout the time the Agreement is in effect, that any and all of its Subcontractors obtain and maintain until the completion of that Subcontractor's work, such of the insurance coverages described herein as are required by law to be provided on behalf of their employees and others.

(4) The Contractor shall obtain, have and maintain during the entire period of the Agreement insurance policies, which contain the following information and provisions:

- (A) The name and type of policy and coverages provided;
- (B) The amount or limit applicable to each coverage provided;
- (C) The date of expiration of coverage;
- (D) The designation of the County as an additional insured and a certificate holder (This requirement may be excepted for workers' compensation and professional liability Insurance);
- (E) The following clause must appear on the Certificate of Insurance:

Should any material change occur in any of the above described policies or should any of said policies be canceled before the expiration date thereof, the issuing company shall mail at least thirty (30) calendar days' written notice to the County.

(5) If the initial, or any subsequently issued Certificate of Insurance expires prior to the completion of the Work or termination of the Agreement, the Contractor shall furnish to the County, in triplicate, renewal or replacement Certificate(s) of Insurance not

later than thirty (30) calendar days prior to the date of their expiration. Failure of the Contractor to provide the County with such renewal certificate(s) shall be considered justification for the County to terminate the Agreement.

(6) Contractor shall include the County, the County's agents, officers and employees in the Contractor's General Liability and Automobile Liability policies as additional insureds.

(7) If the County has any objection to the coverage afforded by other provisions of the insurance required to be purchased and maintained by Contractor in accordance with the requirements of the Contract Documents on the basis of its not complying with the Contract Documents, the County shall notify Contractor in writing thereof within thirty (30) calendar days of the delivery of such certificates to the County. Contractor shall provide to the County such additional information with respect to its insurance as may be requested.

(8) The Contractor shall obtain and maintain the following insurance coverages as provided hereinbefore, and in the type, amounts and in conformance with the following minimum requirements:

**Lee County Insurance Requirements
including Maritime Remedies**

Minimum Insurance Requirements: *Risk Management in no way represents that the insurance required is sufficient or adequate to protect the vendors' interest or liabilities. The following are the required minimums the vendor must maintain throughout the duration of this contract. The County reserves the right to request additional documentation regarding insurance provided*

- a. **Commercial General Liability** - Coverage shall apply to premises and/or operations, products and completed operations, independent contractors, contractual liability exposures with minimum limits of:

\$1,000,000 per occurrence
\$2,000,000 general aggregate
\$1,000,000 products and completed operations
\$1,000,000 personal and advertising injury

- b. **Business Auto Liability** - The following Automobile Liability will be required and coverage shall apply to all owned, hired and non-owned vehicles use with minimum limits of:

\$1,000,000 combined single limit (CSL)
\$500,000 bodily injury per person
\$1,000,000 bodily injury per accident
\$500,000 property damage per accident

- c. **Workers' Compensation** - Statutory benefits as defined by FS 440 encompassing all operations contemplated by this contract or agreement to apply to all owners, officers, and employees regardless of the number of employees. Workers Compensation exemptions may be accepted with written proof of the State of Florida's approval of such exemption. Employers' liability will have minimum limits of:

\$500,000 per accident
\$500,000 disease limit
\$500,000 disease – policy limit

- d. **Maritime Remedies** – coverage shall provide minimum limits of liability of \$1,000,000 per occurrence for General Maritime Laws, including but not limited to:

Maintenance & Cure;
Unseaworthiness;
Wrongful Death;
Jones Act;



d. Maritime Remedies cont.

Death on the High Seas Act;
Longshore and Harbor Workers' Act;
Protection and Indemnity;

And or any other state workers' compensation law, or other federal occupational disease law that your employees might be exposed to.

**The required minimum limit of liability shown in a and b may be provided in the form of "Excess Insurance" or "Commercial Umbrella Policies." In which case, a "Following Form Endorsement" will be required on the "Excess Insurance Policy" or "Commercial Umbrella Policy."*

Verification of Coverage:

1. Coverage shall be in place prior to the commencement of any work and throughout the duration of the contract. A certificate of insurance will be provided to the Risk Manager for review and approval. The certificate shall provide for the following:

a. The certificate holder shall read as follows:

Lee County Board of County Commissioners
P.O. Box 398
Fort Myers, Florida 33902

- b. *"Lee County, a political subdivision and Charter County of the State of Florida, its agents, employees, and public officials" will be named as an "Additional Insured" on the General Liability policy, including Products and Completed Operations coverage.*

Special Requirements:

1. An appropriate "Indemnification" clause shall be made a provision of the contract.
2. It is the responsibility of the general contractor to insure that all subcontractors comply with all insurance requirements.

EXHIBIT I
RELEASE AND AFFIDAVIT

COUNTY OF _____

STATE OF FLORIDA

Before me, the undersigned authority, personally appeared

_____,
who after being duly sworn, deposes and says:

(1) In accordance with the Contract Documents and in consideration of \$_____ paid, _____ ("Contractor") releases and waives for itself and its subcontractors, materialmen, successors and assigns, all claims demands, damages, costs and expenses, whether in contract or in tort, against Lee County, Florida (the "County"), its Board of County Commissioners, employees and agents relating in any way to the performance of the Agreement between Contractor and the County, dated _____, _____, for the period from _____ to _____.

(2) Contractor certifies for itself and its subcontractors, materialmen, successors and assigns, that all charges for labor, materials, supplies, lands, licenses and other expenses for which the County might be sued or for which a lien or a demand against any Payment Bond might be filed, have been fully satisfied and paid.

(3) Contractor agrees to indemnify, defend and save harmless the County, its Board of County Commissioners, employees and agents from all demands or suits, actions, claims of liens or other charges filed or asserted against the County arising out of the performance by Contractor of the Work covered by this Release and Affidavit.

(4) This Release and Affidavit is given in connection with Contractor's [monthly/final] application for payment No._____.

CONTRACTOR:

By: _____ (signature of the executive officer)

Its: _____ (title of the executive officer)

Date: _____

Witnesses

[Corporate Seal]

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me this _____ day of

_____, _____, by _____, as

_____ of _____, a
_____ corporation, on behalf of the corporation. He/she is personally
known to me or has produced _____
as identification and did (did not) take an oath.

My Commission Expires: _____
(Signature of Notary)

Name: _____
(Legibly Printed)

(AFFIX OFFICIAL SEAL)

Notary Public, State of _____

Commission No.: _____

EXHIBIT J COUNTY PROJECT MODIFICATION FORM



County Project Modification (CPM) Form
For Modifications to CPA

Modification Number: _____ to CPA Number: _____

Contract Name: _____

Project Name: _____ Contractor's Name: _____

Contract Number:		Total Project Amount:	
Solicitation Number:		Account Number:	
Lee County Project Manager:		Project Number:	
Fiscal Staff:		Request Date:	

Upon the completion and execution of this Modification by both parties, the Contractor is authorized to and shall proceed to make the following changes in scope of work, compensation, and/or time of work set forth under the abovementioned County Project Authorization, and pursuant to the terms of the agreement executed on _____:

Attachments:

(List documents supporting change)

Explanation of Change:

Change in Project Price	Dollar Amount	Change in Project Time	Calendar Days
Original Project Price		Original Days to Substantial Completion from NTP	
Project Price Prior to this Modification		Original Days to Final Completion from NTP	
Net Increase (Decrease) of this Modification		Revised Days to Substantial Completion from NTP	
Project Price with All Approved Modifications		Revised Days to Final Completion from NTP	

Contractor Signature (Print & Sign Name)

Date Accepted

Contact E-mail Address

Contact Phone Number

Lee County Procurement Signature

Lee County Authorized Signature

Date Accepted

Date Accepted

Lee County Board of County Commissioners - Procurement Management
1500 Monroe Street - Fort Myers, FL 33901
PO Box 398 - Fort Myers, FL 33902-0398
Phone: (239) 533-8881

EXHIBIT K
SUPPLEMENTAL SPECIFICATIONS

INDEX

Reserved

I hereby certify that these Supplemental Specifications have been properly prepared by me, or under my responsible charge:

Supplemental Specification Section(s):		
Signature:		
Date:		
Engineer of Record:		
Florida License No.:		
Firm Name:		
Firm Address:		
City, State, Zip Code:		
Cert. of Authorization No:		

DIVISION I-GENERAL REQUIREMENTS AND COVENANTS

Reserved

DIVISION II-CONSTRUCTION DETAILS

SECTION 102 – MAINTENANCE OF TRAFFIC (LCDOT 10/27/2017)

Article 102-4: Delete Article 102-4 in its entirety and substitute the following:

The Contractor shall submit a complete Traffic Control Plan (TCP) to the Engineer for review and approval at the preconstruction meeting. Prepare the TCP in conformance with and in the form prescribed in the current version of the FDOT Plans Preparation Manual, FDOT Design Standards – Index 600 series and the MUTCD. 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 TCP, and notify the Department in writing of any such potential impacts to utilities. The TCP shall be signed and sealed by a professional engineer duly registered in the State of Florida.

Engineer's approval of the 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 depicted in the original Contract Documents, and which effect a change in utility work different from that shown in the utility plans, joint project agreements, interlocal agreements or utility relocation schedules.

The County reserves the right to reject any Traffic Control Plan. Obtain the Engineer's written approval before beginning work using a TCP. The Engineer's written approval is required for all modifications to the TCP. The Engineer will only allow changes to the TCP without proper documentation on an emergency basis.

Pedestrian and/or bicycle traffic must be safely and continuously maintained through, or around, work zones on highway or streets where pedestrian and bicyclists were permitted at the start of the project. The Contractor shall submit a plan for approval signed and sealed by a professional engineer duly licensed in the State of Florida for the safe passage of pedestrian and bicycle traffic prior to closure of any existing pedestrian facility. Facilities constructed to specifically provide access for pedestrians in or around work zones must be consistent with the current PROWAG. The plan shall detail the rerouting of users, duration of closure and proposed construction methods for any temporary facility. Payment for this work shall be included in price bid for Pay Item 102-1a -Maintenance of Pedestrian and Bicycle Traffic.

All costs for maintenance of traffic including preparation of Traffic Control Plan shall be included in the price bids for Pay Item 102-1 – Maintenance of Traffic, except as

expressly provided for in other pay items in the contract.

Subarticle 102-9.15: Delete Subarticle 102-9.15 in its entirety and substitute the following:

Temporary Traffic Detection Technology – Maintain all existing actuated or traffic responsive mode signal operations for main and side street movements for the duration of the contract and restore any loss of detection within 12 hours. Video detection shall be installed at the beginning of the project before any loss of detection has occurred. The contractor shall furnish, install and operate video detection using technology approved by Lee DOT Traffic Division and as listed in Lee DOT Traffic plans specifications posted on the county website at http://www.lee-county.com/publicworks/pdf/traffic/DOT_Plan_Specifications.pdf.

SECTION 430 – PIPE CULVERTS AND STORM SEWERS (LCDOT 10/27/2017)

Article 430-3: Articles 430-3.1 and 430-3.2 are modified as follows:

Pipe material for storm sewer or cross drain installations under pavement shall consist of steel reinforced concrete pipe in accordance with Section 449 and shall be a minimum of Class III or HE-III.

DIVISION III-MATERIALS

Reserved

EXHIBIT L
SPECIAL PROVISIONS

1. CONTRACT TIME

Contractor shall perform the contracted work fully, entirely, and in accordance with the Contract Documents within the Contract Time specified herein. If the Contractor fails to complete the work within the time stipulated, liquidated damages will apply in accordance with Standard Specification Article 8-10 Liquidated Damages for Failure to Complete the Work.

Contract Time: Per Project STA

2. PERMITS

In accordance with Article 7-2 of Division I, permits and licenses procured by the County are listed below and attached hereto.

3. GEOTECHNICAL INFORMATION

Certain subsurface explorations and/or testing were conducted by the County in the design of this Project. Reports summarizing this work are listed below and attached hereto. The attached information is NOT a part of the Contract Documents and is provided as a supplement for informational purposes only. The County is not responsible for the accuracy, completeness or usefulness thereof. The County makes no warranty, express or implied, for the data, interpretations or opinions contained therein. Any person or party that utilizes the attached information does so purely at its own risk, and the County disclaims any responsibility or liability for any user's reliance upon the information.

EXHIBIT M
TECHNICAL SPECIAL PROVISIONS

I hereby certify that these Technical Special Provisions have been properly prepared by me, or under my responsible charge:

Technical Special Provision Section(s):		
Signature:		
Date:		
Engineer of Record:		
Florida License No.:		
Firm Name:		
Firm Address:		
City, State, Zip Code:		
Cert. of Authorization No:		

SECTION 101 MOBILIZATION

101-1 Description.

Perform preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site and for the establishment of temporary offices, buildings, safety equipment and first aid supplies, and sanitary and other facilities. Include the costs of bonds and any required insurance and any other preconstruction expense necessary for the start of the work, excluding the cost of construction materials.

101-2 Basis of Payment.

101-2.1 When a Separate Item is Included in the Proposal: When the proposal includes a separate item of payment for this work, the work and incidental costs specified as being covered under this Section will be paid for at the Contract lump sum price for the item of Mobilization.

Payment will be made under:

Item No. 101- 1- Mobilization -lump sum.

101-2.2 Partial Payments: When the proposal includes a separate pay item for Mobilization and the Notice to Proceed has been issued, partial payments will be made in accordance with the following:

For contracts of 120 contract days duration or less, partial payment will be made at 50% of the bid price per month for the first two months. For contracts in excess of 120 contract days duration, partial payment will be made at 25% of the bid price per month for the first four months. In no event shall more than 50% of the bid price be paid prior to commencing construction on the project site.

Total partial payments for Mobilization on any project, including when more than one project or job is included in the Contract, will be limited to 10% of the original Contract amount for that project. Any remaining amount will be paid upon completion of all work on the Contract.

Retainage, as specified in 9-5, will be applied to all partial payments.

Partial payments made on this item will in no way act to preclude or limit any of the provisions for partial payments otherwise provided for by the Contract.

101-2.3 When No Separate Item is Included in the Proposal: When the proposal does not include a separate item for Mobilization, all work and incidental costs specified as being covered under this Section will be included for payment under the several scheduled items of the overall Contract, and no separate payment will be made therefore.

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 (MOT) in construction areas. Provide any other special requirements for safe and expeditious movement of traffic specified in the Plans. MOT 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 AdhesiveSection 970
Temporary Retroreflective Pavement Markers...Section 990
PaintSection 971
Removable TapeSection 990
Glass SpheresSection 971
Temporary Traffic Control Device MaterialsSection 990
Retroreflective and Nonreflective Sheeting
for Temporary Traffic Control DevicesSection 994

102-2.1 Temporary Traffic Control Devices: Use only the materials meeting the requirements of Section 990, Section 994, Design Standards and the Manual on Uniform Traffic Control Devices (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 who is responsible for initiating, installing, and maintaining all temporary traffic control devices as described in this Section and the Contract Documents. Provide all equipment and materials needed to set up, take down, maintain traffic control, and handle traffic-related situations. Use approved alternate Worksite Traffic Supervisors when necessary.

The Worksite Traffic Supervisor must meet the personnel qualifications specified in Section 105.

The Worksite Traffic Supervisor is to perform the following duties:

1. On site direction of all temporary 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 ensuring proper temporary

traffic control.

4. Immediately corrects all safety deficiencies and corrects minor deficiencies that are not immediate safety hazards within 24 hours.

5. Is available on a 24 hour per day basis and present at the site within 45 minutes after notification of an emergency situation and is prepared to respond to maintain temporary 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 deemed necessary.

Pedestrians are to be accommodated with a safe, accessible travel path around work sites separated from mainline traffic in compliance with the Americans with Disabilities Act (ADA)

Standards for Transportation Facilities. Maintain existing or detour bicycle facilities

satisfactorily throughout the project limits. Existing businesses in work areas are to be provided with adequate entrances for vehicular and pedestrian traffic during business hours.

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.

102-3.3 Lane Closure Information System: Approval for all lane closures, mobile operations, and traffic pacing operations is required. Submit routine requests fourteen calendar days in advance of all lane closures, mobile operations, and traffic pacing operations at the following URL address: <https://lcis.dot.state.fl.us/> . For unforeseen events that require cancelling or rescheduling lane closures, mobile operations, and traffic pacing operations, revise the lane closure request as soon as possible.

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 and submit to the Engineer. Prepare the TCP in conformance with and in the form outlined in the current version of the Department's 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 TCPs) 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 TCP. 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 are the minimum standards for the use in the development of all TCPs. 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 MOT, 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 MOT 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 MOT.

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 vehicles, 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 median opening, road or street crossing the project unless approved by the Engineer. Before beginning any construction, submit to the Engineer the names 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 flaggers to control traffic when traffic in both directions must use a single lane and in other situations as required. All flaggers must meet the personnel qualifications specified in 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, retroreflective 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, retroreflective 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 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 their end of service life. The warning lights shall be a high intensity amber or white rotating, flashing, oscillating or strobe light. Lights shall 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 warning lights.

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 pedestrian facilities are detoured, blocked or closed during the work, provide safe alternate accessible routes through or around the work zone meeting the requirements of the ADA Standards for Transportation Facilities.

When 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.

Provide two Contractor representatives, who will be directly involved in the erection of Department-owned temporary bridging, to attend a mandatory one-day training session to be conducted at the Department's storage facility. No bridging will be released to the Contractor prior to the completion of this training.

Submit the following: company name, phone number, office address, project contact person, names of the representatives who will attend the training described above, 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, the Engineer will, within 10 calendar days submit an approved material list to the Contractor and the appropriate Department storage yard.

Submit the name of the representative with authority to pick up components, to the Engineer at least 10 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 10 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 Department's 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 a 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 scabblers machine for roughening the roadway surface of the detour bridge decking. Provide an air compressor at the job site with 200 cubic feet per minute capacity, 90 psi air pressure for the power supply of the machine, and an operator. Transport the scabblers machine to and from the Department's structures shop. Repair any damage to the scabblers 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 10 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 the materials 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. Directing traffic/overriding the signal in a signalized intersection.
2. When Design Standards, Index No. 619 is used on freeway facilities (interstates, toll roads, and expressways) at nighttime for work within the travel lane.
3. When Design Standards, 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.
5. When Design Standards, Index No. 625 Temporary Road Closure 5 Minutes or

Less is used.

102-8 Driveway Maintenance.

102-8.1 General: Ensure that each residence and 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 Department's Approved Product 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 APL or meeting the requirements of the Design Standards. 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 submit 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 APL shall include the manufacturer's self-certification letter. Manufacturer's seeking evaluation of Category II and Category III devices for inclusion on the APL 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. Vendor drawings for Category III devices and automated flagger assistance devices (AFADs) 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 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.

The APL number is to be permanently marked on the device at a readily visible location. Sheeting used on devices is exempt from this marking requirement.

Notify the Engineer in writing of any scheduled operation that will affect traffic patterns or safety sufficiently in advance of commencing such operation to permit review of the plan for the proposed installation of temporary traffic control devices.

Assign an employee 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.

Maintain temporary traffic control devices in the correct position, properly oriented, clearly visible and clean, at all times. All traffic control devices must meet the classification level of Acceptable as defined in the American Traffic Safety Services Association (ATSSA) Quality Guidelines for Temporary Traffic Control Devices and Features (2008-09 Edition). Immediately repair, replace or clean damaged, defaced or dirty devices. Traffic control devices shall not be cleaned while installed/used. Use of warning lights on any temporary traffic control device shall be prohibited, with the exception of the trailer mounted portable regulatory signs.

Employ an approved independent Channelizing Device Supplier (CDS) to provide and maintain the condition of the following non-fixed channelizing devices: drums, cones, vertical panels, barricades, tubular markers, and longitudinal channeling devices. Cones may be provided and maintained by the Contractor.

The CDS shall not be affiliated with the Contractor and shall be approved by the Engineer in accordance with 102-9.1.1. The CDS shall submit a monthly certification on letterhead that the channelizing devices mentioned above installed/used within the work zone meet acceptable standards as outlined in ATSSA Quality Guidelines for Temporary Traffic Control Devices and Features. The certification shall include the following statement, "I certify that I have provided and maintained the following devices <list devices covered under the certification> in accordance with the ATSSA Quality Guidelines for Temporary Traffic Control Devices and Features." If the Contractor chooses to provide and maintain cones, the Contractor shall submit a monthly certification on a Department approved form that all cones installed/used within the work zone meet acceptable standards as outlined in ATSSA Quality Guidelines for Temporary Traffic Control Devices and Features, and the CDS shall submit the monthly certification for any other channelizing devices installed/used within the work zone.

102-9.1.1 Approved Independent Channelizing Device Supplier (CDS)

Requirements: Submit the following documents to the Engineer for independent CDS approval at the preconstruction conference. CDSs may elect to provide a one-time submittal of this information for approval and have the information posted on the State Construction Office website for use by Department personnel. Inform the Engineer at the preconstruction conference of this approval.

1. A letter on company letterhead signed and dated by the owner of the company or company officer with the following information and statements:
 - a. The company's owners, stockholders, and officers.
 - b. A statement declaring that the company will not perform as a CDS on any project where there is common ownership, directly or indirectly, between the company and the Contractor.
 - c. A statement declaring that the company will furnish and maintain the condition of all channelizing devices with the exception of cones as required in 102-9.1 with its own forces.
 - d. A statement declaring at least five years of experience in providing channelizing device supplier services, with its own inventory of channelizing devices.
 - e. On a separate sheet, list a sample project history of the company's experience as a channeling device supplier for the five years declared in item 1(d) above including the following information:
 1. Project name and number and a brief description of CDS work performed,
 2. Beginning and ending date of CDS project activities,
 3. Location of project (city, state),
 4. Monetary amount of CDS work on project,
 5. Owner of project, contact person and phone number with area code,
 6. Name of Contractor (client) that the work was performed for and phone number with area code.
2. A maintenance plan for approval by the Department that outlines the frequency and methods for maintaining the condition of all channelizing devices, except cones owned and maintained by the Contractor, installed/used in the work zone.

102-9.2 Work Zone Signs: Furnish, install, maintain, remove and relocate signs in accordance with the Plans and Design Standards, Index No. 600. Use signs that meet the material and process requirements of Section 994. Use Type IV sheeting for fluorescent orange work

zone signs. Roll-up signs must meet the requirements of Type VI sheeting. Use Type IV or Type XI sheeting for all other work zone signs. Attach the sign to the sign support using hardware meeting the manufacturer's recommendations on the APL vendor drawings or as specified in the Design Standards.

102-9.2.1 Post Mounted Signs: Meet the requirements of 990-8.

102-9.2.2 Portable Signs: Use only approved systems, which includes sign stands and attachment hardware (nuts, bolts, clamps, brackets, braces, etc.), meeting the vendor requirements specified on the APL drawings. 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 NCHRP Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

102-9.2.3 Barrier Mounted Signs: If post mounting criteria cannot be achieved in accordance with Design Standards, Index No. 600 and a barrier or traffic railing exists, use temporary sign criteria provided in Design Standards, Index No. 11871.

102-9.3 Business Signs: Provide and place signs in accordance with the Plans and Design Standards, Index No. 600 series. Furnish signs having retroreflective sheeting meeting the requirements of Section 990.

102-9.4 Project Information Signs: Provide and place signs in accordance with the Plans and Design Standards, Index No. 600 series. Furnish signs having retroreflective sheeting meeting the requirements of Section 990.

102-9.5 Channelizing Devices: Furnish and install 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 APL 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 inch collar a uniform 3-1/2 inches distance from the top of the cone and the lower 4 inch collar a uniform 2 inches distance below the bottom of the upper 6 inch collar. Collars are to be 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 Longitudinal Channelizing Devices (LCDs): Use LCDs listed and categorized on the APL as vehicular, pedestrian or vehicular/pedestrian. Retroreflective sheeting must meet the requirements of Section 990. LCDs must be interlocked except for the stand-alone unit placed perpendicular to a sidewalk. For LCDs requiring internal ballasting, an indicator that clearly identifies the proper ballast level will be required.

Use alternating orange and white solid color vehicular LCDs. Vehicular LCDs may be substituted for drums, vertical panels, or barricades.

102-9.6 Barrier Wall (Temporary): Furnish, install, maintain, remove and relocate temporary barrier wall in accordance with the Plans. Obtain and use precast temporary barrier wall from a manufacturing plant that is on the Department's Production Facility Listing. Producers seeking inclusion on the list shall meet the requirements of Section 105. Temporary barrier wall must meet the material and construction requirements of Section 521 unless noted otherwise in the Design Standards.

The maximum allowable height increase between consecutive temporary barrier wall units in the direction of traffic is 1 inch.

Temporary concrete barrier wall used on roadway sections must comply with Design Standards, Index Nos. 412, 415 or 414. Temporary concrete barrier wall used on bridge and wall sections, shall comply with Design Standards, Index No 414.

Temporary water filled barrier wall used on roadway sections shall meet the NCHRP Report 350 or MASH criteria and be listed on the APL.

Barriers meeting the requirements of Design Standards, Index Nos. 412, 415 or

temporary water filled barriers on the APL will not be accepted as an alternate to barriers meeting the requirements of Design Standards, Index No. 414.

Trailer mounted barriers listed on the APL may be used at the option of the Contractor. Trailer mounted barriers listed on the APL must have an FHWA eligibility letter and be successfully crash tested in accordance with MASH TL-3 criteria. All trailer mounted barriers must be equipped with an APL listed truck mounted attenuator, an APL listed vehicle mounted arrow board and vehicle warning lights in accordance with this Section.

102-9.6.2.1 Temporary Barrier Wall Meeting the Requirements of Design Standards, Index Nos. 412 and 414: Ensure the marking requirements of the respective Index are met.

102-9.6.2.2: Proprietary Precast Temporary Barrier Wall Fabricated prior to 2005: The Contractor must submit a certification stating that all unmarked barrier wall units meet the requirements of the Specifications and the Design Standards. Certifications will be project specific and non-transferable

102-9.6.2.3 Proprietary Precast Temporary Barrier Wall Fabricated in 2005 or later: Ensure each wall unit has permanent clear markings, showing the manufacture date, serial number, manufacturer's name or symbol, and the APL number. Label the markings on a plate, plaque, or cast in the unit. Proprietary barrier wall fabricated prior to 2016 and marked with the "INDX 521" in lieu of the APL number will be permitted.

102-9.7 Barrier Delineators: Install barrier delineators on top of temporary barrier wall and vehicular LCDs meeting the requirements of the Design Standards and Section 705.

102-9.8 Glare Screen (Temporary): Use temporary glare screens listed on the APL 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. The anchorage of the glare screen to the barrier must be capable of safely resisting an equivalent tensile load of 600 pounds per foot 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, barrier delineators will not be required.

102-9.9 Temporary Crash Cushion (Redirective/Gating): 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 APL. Delineate the crash cushion in accordance with Section 544. 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.

102-10 Guardrail (Temporary): Furnish guardrail (temporary) in accordance with the Plans and Design Standards. Meet the requirements of Section 536.

102-11 Arrow Board: Furnish arrow boards 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. Type B arrow boards may be used on low to intermediate speed (0 mph to 50 mph) facilities or for maintenance or moving operations on any speed facility. Type C arrow boards shall be used for all other operations on high-speed (50 mph and greater) facilities and may be substituted for Type B arrow boards on any speed facility.

102-9.12 Portable Changeable Message Sign (PCMS): Furnish PCMSs or truck mounted 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.

102-9.13 Portable Regulatory Signs (PRS): Furnish PRSs 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.

102-9.14 Radar Speed Display Unit (RSDU): Furnish RSDUs 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.

102-9.15 Temporary Signalization and Maintenance: Provide temporary signalization and maintenance at existing, temporary, and new intersections including but not limited to the following:

1. Installation of temporary poles and span wire assemblies as shown in the Plans,
 2. Temporary portable traffic signals as shown in the Plans,
 3. Adding or shifting signal heads,
 4. Trouble calls,
 5. Maintaining intersection and coordination timing and preemption devices. Coordination timing will require maintaining functionality of system communications. Restore any loss of operation within 12 hours after notification.
- Provide traffic signal equipment that meets the requirements of the Design Standards and 603-2. The Engineer may approve used signal equipment if it is in acceptable condition. Replacement components for traffic signal cabinet assemblies will be provided by the maintaining agency.

102-9.16 Temporary Traffic Detection and Maintenance: Provide temporary traffic detection and maintenance at existing, temporary, and new signalized intersections. Provide temporary traffic detection equipment listed on the APL. Restore any loss of detection within 12 hours. Ensure 90% accuracy per signal phase, measured at the initial installation and after any lane shifts, by comparing sample data collected from the detection system with ground truth data collected by human observation. Collect the sample and ground truth data for a minimum of five minutes during a peak and five minutes during an off-peak period with a minimum three detections for each signal phase. Perform the test in the presence of the Engineer.

102-9.17 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 APL.

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.

Install either alternating black with yellow or white with orange sheeting on the rear of trailer mounted attenuators and on truck mounted attenuators, in both the operating and raised position. Use Type III (work zone) or Type IV sheeting consisting of 4 or 6 inch wide stripes installed to form chevrons that point upward. All sheeting except black shall be retroreflective.

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 MOT 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.

102-9.18 Temporary Raised Rumble Strip Set: Furnish, install, maintain, remove, and reinstall temporary raised rumble strips per the manufacturer's recommendations and in accordance with Design Standards, Index No. 603.

The temporary raised rumble strip may be either a removable polymer striping tape or a molded engineered polymer material.

102-9.19 Automated Flagger Assistance Devices (AFAD): Furnish, install, maintain, remove, and relocate AFADs in accordance with the Plans, Design Standards, Index No. 603, and APL vendor drawings. Manufacturers seeking evaluation of their product for the APL must submit an application in accordance with Section 6 and include detailed vendor drawings showing typical application of the device in accordance with Design Standards, Index No.603. Position AFADs where they are clearly visible to oncoming traffic. AFADs may be placed on the centerline if they have been successfully crash tested in accordance with MASH TL-3 criteria. A gate arm is required in accordance with Section 990 if a single AFAD is used on the shoulder to control one direction 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 location. Use only flaggers trained in accordance with Section 105 and in the operation of the AFAD. When in use, each AFAD must be in view of, and attended at all times by, the flagger operating the device.

Provide two flaggers on-site and use one of the following methods in the deployment of AFADs:

1. Place an AFAD at each end of the temporary traffic control zone, or
2. Place an AFAD at one end of the temporary traffic control zone and a flagger at the opposite end.

A single flagger may simultaneously operate two AFADs as described in (1) or a single AFAD as described in (2) if all of the following conditions are met:

1. The flagger has an unobstructed view of the AFAD(s),
2. The flagger has an unobstructed view of approaching traffic in both directions,
3. For two AFADs, the AFADs are less than 800 feet apart. For one AFAD, the AFAD and the flagger are less than 800 feet apart.
4. Two flaggers are available on-site to provide normal flagging operations should an AFAD malfunction.

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.

Illuminate the flagging station when the AFAD is used at night. When the AFAD is not in use, remove or cover signs and move the AFAD device outside the clear zone or shield it with a barrier.

AFADs will not be paid for separately. AFADs may be used as a supplement or an alternate to flaggers in accordance with the Plans, Design Standards, Index No. 603, and the APL vendor drawings. Include the cost for AFADs in Maintenance of Traffic Lump Sum.

102-9.20 Temporary Lane Separator: Furnish, install, maintain, remove and relocate temporary lane separator in accordance with the Plans and Design Standards, Index No 600.

Anchor the portable temporary lane separator with a removable anchor bolt. Use epoxy on bridge decks where anchoring is not allowed. Remove the epoxy from the bridge deck by hydroblasting or other method approved by the Engineer.

102-10 Work Zone Pavement Marking.

102-10.1 Description: Furnish and install standard paint for MOT 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, crosswalks, and turn arrows will be required in work zones prior to opening the road to traffic.

102.10.2 Painted Pavement Markings:

102-10.2.1 General: Use painted pavement markings meeting the requirements of Section 710. Use standard 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 APL as shown in the Plans 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 plus or minus 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 pavement 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 Class B RPMs for all locations, except centerline rumble striping operations, where Class D and Class B RPMs are required. All markers must be listed on the APL. Install all markers in accordance with the manufacturer's recommendations and in accordance with Design Standards, Index Nos. 519, 600, and 17352, prior to opening the road to traffic. After initial installation, replace markers any time more than three consecutive markers fail or are missing at no expense to the Department.

102-11 Method of Measurement.

102-11.1 General: Devices installed/used on the project on any calendar day or portion thereof, within the 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 vehicles 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 diversion or lane shift that requires temporary pavement is shown in the Plans, the work of constructing, maintaining, and subsequently removing such detour facilities will be paid for as a special detour. However, traffic control devices, warning devices, barriers, signing, pavement markings, and restoration to final configuration will be paid for under their respective pay items.

When the Plans show more than one special detour, each special detour will be paid for separately, at the Contract lump sum price for each.

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 posts, each sign panel will be paid individually. Signs greater than 20 square feet 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.

The number of temporary barrier mounted signs (temporary regulatory, warning and guide) certified as installed/used on the project will be paid for at the Contract unit price for barrier mounted work zone signs.

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 **Project Information Signs:** No separate payment will be made for project information signs. Payment will be included under Lump Sum MOT.

102-11.8 **Channelizing Devices:** The number of drums, vertical panels, pedestrian LCDs, and Type I, Type II, Type III, or direction indicator barricades, 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 channelizing device. Payment for vehicular LCDs will be paid as the length in feet installed divided by the device spacing for barricades, vertical panels, and drums and 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 price for channelizing device. Payment will not be made for channelizing devices unsatisfactorily maintained, as determined by the Engineer. 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 14 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 **Barrier Delineators:** No separate payment will be made for barrier delineators installed on top of temporary barrier wall and vehicular LCDs.

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 **Gating:** The quantity to be paid for will be the number of temporary crash cushions (gating) certified as installed/used and maintained on the project, including object marker.

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 **Arrow Board:** The quantity to be paid at the contract unit price will be for the number of arrow boards 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 PCMSs or truck mounted 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 Signalization and Maintenance: For existing intersections, the certified quantity to be paid for will be the number of signalized intersections per day for the full duration of the Contract. For temporary intersections, the certified quantity to be paid for will be the number of signalized intersections per day for the duration of the temporary intersection. No separate payment will be made for temporary signalization and maintenance at new intersections.

102-11.19 Temporary Traffic Detection and Maintenance: For existing intersections, the certified quantity to be paid for will be the number of signalized intersections per day beginning the day Contract Time begins and ending the day the permanent detection is operational and the final lane configuration is in place. For temporary and new intersections, the certified quantity to be paid for will be the number of signalized intersections per day beginning the day the temporary detection is functional and ending the day the permanent detection is operational and the final lane configuration is in place for a new intersection; or, when the detection is removed for a temporary intersection.

102-11.20 Work Zone Pavement Markings: The quantities of work zone pavement markings authorized and acceptably applied under this Section and certified as installed/used on the project, will be paid for as follows:

1. The length in gross miles, of solid, 10'-30' skip, 3'-9' dotted, 6'-10' dotted, and 2'-4' dotted lines.

The gross mile measurement will be taken as the distance from the beginning of the painted line to the end of the painted line and will include the unmarked gaps for skip and dotted lines. The gross mile measurement will not include designated unmarked lengths at intersections, turn lanes, etc. Final measurement will be determined by plan dimensions or stations, subject to 9-1.3.1.

2. The length, in linear feet, of transverse lines, diagonal lines, chevrons, and parking spaces.

3. The number of pavement messages, symbols, and arrows. Each arrow is paid as a complete marking, regardless of the number of "points" or directions.

4. The number of temporary RPM's authorized and acceptably applied.

102-11.21 Temporary Raised Rumble Strips: The quantity to be paid for will be the number of calendar days, or portions thereof, that temporary raised rumble strips are certified as installed/used on the project within the Contract Time. The number of strips used must meet the requirements of the Design Standards, Index No. 603. No adjustment will be made to the per day measurement for the number of strips or sets used, or for the number of times the sets are relocated.

102-11.22 Temporary Lane Separator: The quantity to be paid for will be the field measure, in feet, of temporary lane separator certified as installed/used on the project, including drainage gaps, completed and accepted.

102-12 Submittals.

102-12.1 Submittal Instructions: Prepare a certification of quantities, using the Department's current approved form, for certified MOT 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:

1. Contract Number, FPID Number, Certification Number, Certification Date and the period that the certification represents.
2. 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 MOT 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 in the Plans and all costs incurred in carrying out all requirements of this Section for general MOT within the limits of the detour, as shown in 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 Project Information Signs: Price and payment will be full compensation for all materials and labor for furnishing, installing, relocating, maintaining and removing signs.

102-13.8 Channelizing Devices: Prices and payment will be full compensation for furnishing, installing, relocating, maintaining and removing the channelizing devices.

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 Barrier Delineators: Price and payment will be full compensation for furnishing, installing and maintaining the barrier delineators.

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 (Redirective/Gating): Price and payment will be full compensation for furnishing, installing, maintaining and subsequently removing such crash cushions.

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 Arrow Board: Price and payment will be full compensation for furnishing,

installing, operating, relocating, maintaining and removing arrow boards.

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 MOT 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 MOT operations. Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing radar speed display unit.

102-13.18 Temporary Signalization and Maintenance: 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. Payment will be withheld for each day at each intersection where the temporary signalization is not operational within 12 hours after notification.

102-13.19 Temporary Traffic Detection and Maintenance: Price and payment will constitute full compensation for furnishing, installing, operating, maintaining and removing temporary traffic detection including all equipment and components necessary to provide an acceptable signalized intersection. Take ownership of all equipment and components. Payment will be withheld for each day at each intersection where the temporary detection is not operational within 12 hours after notification.

102-13.20 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 standard paint at no additional cost to the Department.

Payment for temporary RPMs used to supplement line markings will be paid for under temporary retroreflective pavement markers. Install these markers as detailed in the Design Standards.

102-13.21 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.

102-13.22 Temporary Lane Separator: Price and payment will be full compensation for all work specified in this Section.

102-13.23 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- 62- Barrier Mounted Work Zone Sign – per each per day
Item No. 102- 71- Barrier Wall - per foot.
Item No. 102- 75- Temporary Lane Separator - per foot
Item No. 102- 94- Glare Screen - per foot.
Item No. 102- 73- Guardrail (Temporary) - per foot.
Item No. 102- 74- Channelizing Devices - per each per day.
Item No. 102- 76- Arrow Board - per each per day.
Item No. 102- 78- Temporary Retroreflective Pavement Markers - each.
Item No. 102- 81- Crash Cushion (Gating) (Temporary) - per location.
Item No. 102- 89- Crash Cushion (Redirective) (Temporary) - per location.
Item No. 102- 99- Portable Changeable Message Sign (Temporary) - per each per day.
Item No. 102-104- Temporary Signalization and Maintenance - per intersection per day.
Item No. 102-107- Temporary Traffic Detection and Maintenance - per intersection 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. 102-909- Temporary Raised Rumble Strips - per day.
Item No. 102-911- Removable Tape (White/Black) - per gross mile.
Item No. 102-912- Removable Tape (Yellow) - per gross mile.
Item No. 710- Painted Pavement Markings.
Item No. 711- Thermoplastic Pavement Markings.

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

104-1 Description.

Provide erosion control measures on the project and in areas outside the right-of-way where work is accomplished in conjunction with the project, so as to prevent pollution of water, detrimental effects to public or private property adjacent to the project right-of-way and damage to work on the project. Construct and maintain temporary erosion control features or, where practical, construct and maintain permanent erosion control features as shown in the Plans or as may be directed by the Engineer.

104-2 General.

Coordinate the installation of temporary erosion control features with the construction of the permanent erosion control features to the extent necessary to ensure economical, effective, and continuous control of erosion and water pollution throughout the life of the Contract. Due to unanticipated conditions, the Engineer may direct the use of control features or methods other than those included in the original Contract. In such event, the Department will pay for this additional work as unforeseeable work.

104-3 Control of Contractor's Operations Which May Result in Water Pollution.

Prevent pollution of streams, canals, lakes, reservoirs, and other water impoundments with fuels, oils, bitumens, calcium chloride, or other harmful materials. Also, conduct and schedule operations to avoid or otherwise minimize pollution or siltation of such water impoundments, and to avoid interference with movement of migratory fish. Do not dump any residue from dust collectors or washers into any live stream.

Restrict construction operations in rivers, streams, lakes, tidal waters, reservoirs, canals, and other water impoundments to those areas where it is necessary to perform filling or excavation to accomplish the work shown in the Plans and to those areas which must be entered to construct temporary or permanent structures. As soon as conditions permit, promptly clear rivers, streams, and impoundments of all obstructions placed therein or caused by construction operations.

Do not frequently ford live streams with construction equipment. Wherever an appreciable number of stream crossings are necessary at any one location, use a temporary bridge or other structure.

Except as necessary for construction, do not deposit excavated material in rivers, streams, canals, or impoundments, or in a position close enough thereto, to be washed away by high water or runoff.

Where pumps are used to remove highly turbid waters from enclosed construction areas such as cofferdams or forms, treat the water by one or more of the following methods prior to discharge into State waters: pumping into grassed swales or appropriate vegetated areas or sediment basins, or confined by an appropriate enclosure such as turbidity barriers when other methods are not considered appropriate.

Do not disturb lands or waters outside the limits of construction as staked, except as authorized by the Engineer.

Obtain the Engineer's approval for the location of, and method of operation in, borrow pits, material pits, and disposal areas furnished for waste material from the project (other than commercially operated sources) such that erosion during and after completion of the work will not result in probability of detrimental siltation or water pollution.

104-4 Materials for Temporary Erosion Control.

The Engineer will not require testing of materials used in construction of temporary erosion control features other than as provided for geotextile fabric in 985-3 unless such material is to be incorporated into the completed project. When no testing is required, the Engineer will

base acceptance on visual inspection.

The Contractor may use new or used materials for the construction of temporary silt fence, staked turbidity barriers, and floating turbidity barrier not to be incorporated into the completed project, subject to the approval of the Engineer.

104-5 Preconstruction Requirements.

Prior to the Preconstruction Conference, submit to the Department an Erosion Control Plan meeting the requirements or special conditions of all permits authorizing project construction. If no permits are required or the approved permits do not contain special conditions or specifically address erosion and water pollution, the project Erosion Control Plan will be governed by 7-1.1, 7-2.2, 7-8.1, 7-8.2, and Section 104.

When a DEP generic permit is issued, the Contractor's Erosion Control Plan shall be prepared to accompany the Department's Stormwater Pollution Prevention Plan (SWPPP). Ensure the Erosion Control Plan includes procedures to control off-site tracking of soil by vehicles and construction equipment and a procedure for cleanup and reporting of non-storm water discharges, such as contaminated groundwater or accidental spills. Do not begin any soil disturbing activities until Department approval of the Contractor's Erosion Control Plan, including required signed certification statements have been submitted to the Department. Failure to sign and submit any required documents or certification statements will be considered a default of the Contract. Any soil disturbing activities performed without the required signed documents or certification statements may be considered a violation of the DEP Generic Permit.

When the SWPPP is required, prepare the Erosion Control Plan in accordance with the planned sequence of operations and present in a format acceptable to the Department. The Erosion Control Plan shall describe, but not be limited to, the following items or activities:

1. For each phase of construction operations or activities, supply the following information:
 - a. Locations of all erosion control devices
 - b. Types of all erosion control devices
 - c. Estimated time erosion control devices will be in operation
 - d. Monitoring schedules for maintenance of erosion control devices
 - e. Methods of maintaining erosion control devices
 - f. Containment or removal methods for pollutants or hazardous wastes
2. The name and telephone number of the person responsible for monitoring and maintaining the erosion control devices.
3. Submit for approval the Erosion Control Plans meeting paragraphs 3a, 3b, or 3c below:

- a. Projects permitted by the Southwest Florida Water Management District (SWFWMD), require the following:

Submit the Erosion Control Plan to the Engineer for review and to the appropriate SWFWMD Office for review and approval. Include the SWFWMD permit number on all submitted data or correspondence.

The Contractor may schedule a meeting with the appropriate SWFWMD Office to discuss his Erosion Control Plan in detail, to expedite the review and approval process. Advise the Engineer of the time and place of any meetings scheduled with SWFWMD.

Do not begin construction activities until the Erosion Control Plan receives written approval from both SWFWMD and the Engineer.

- b. Projects permitted by the South Florida Water Management District or the St. Johns River Water Management District, require the following:

Obtain the Engineer's approval of the Erosion Control Plan.

Do not begin construction activities until the Erosion Control Plan

receives written approval from the Engineer.

c. Projects authorized by permitting agencies other than the Water Management Districts or projects for which no permits are required require the following: The Engineer will review and approve the Contractor's Erosion Control Plan.

Do not begin construction activities until the Erosion Control Plan receives written approval from the Engineer.

Comply with the approved Erosion Control Plan.

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:

<http://www.dot.state.fl.us/programmanagement/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.

Complete the installation of sediment control devices 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 in 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 in 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. Submit to the Engineer, certified test reports from the manufacturer 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.

104-7 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 the Contract Documents.

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.

SECTION 110 CLEARING AND GRUBBING

110-1 Description.

Clear and grub within the areas of the roadway right-of-way and of borrow pits, sandclay base material pits, lateral ditches, and any other areas shown in the Plans to be cleared and grubbed. Remove and dispose of all trees, stumps, roots and other such protruding objects, buildings, structures, appurtenances, existing flexible asphalt pavement, and other facilities necessary to prepare the area for the proposed construction. Remove and dispose of all product and debris not required to be salvaged or not required to complete the construction. Also, perform certain miscellaneous work the Engineer considers necessary for the complete preparation of the overall project site, as follows:

1. Plug any water wells that are encountered within the right-of-way and that are to be abandoned.
2. Level the terrain outside the limits of construction for purposes of facilitating maintenance and other post-construction operations in accordance with 110-10.3.
3. Trim trees and shrubs within the project right-of-way that are identified in the Contract Documents.

Meet the requirements for such miscellaneous work as specified in 110-10.

110-2 Standard Clearing and Grubbing.

110-2.1 Work Included: Completely remove and dispose of all buildings, timber, brush, stumps, roots, rubbish, debris, and all other obstructions resting on or protruding through the surface of the existing ground and the surface of excavated areas, and all other structures and obstructions necessary to be removed and for which other items of the Contract do not specify the removal thereof, including septic tanks, building foundations, and pipes.

Perform Standard Clearing and Grubbing within the following areas:

1. All areas where excavation is to be done, including borrow pits, lateral ditches, right-of-way ditches, etc.
2. All areas where roadway embankments will be constructed.
3. All areas where structures will be constructed, including pipe culverts and other pipe lines.

110-2.2 Depths of Removal of Roots, Stumps, and Other Debris: In all areas where excavation is to be performed, or roadway embankments are to be constructed, remove roots and other debris to a depth of 12 inches below the ground surface. Remove roots and other debris from all excavated material to be used in the construction of roadway embankment or roadway base. Plow the surface to a depth of at least 6 inches, and remove all roots thereby exposed to a depth of at least 12 inches. Completely remove and dispose of all stumps within the roadway right-of-way.

Remove all roots, etc., protruding through or appearing on the surface of the completed excavation within the roadway area and for structures, to a depth of at least 12 inches below the finished excavation surface.

Remove or cut off all stumps, roots, etc., below the surface of the completed excavation in borrow pits, material pits, and lateral ditches.

In borrow and material pits, do not perform any clearing or grubbing within 3 feet inside the right-of-way line.

Within all other areas where Standard Clearing and Grubbing is to be performed remove roots and other debris projecting through or appearing on the surface of the original ground to a depth of 12 inches below the surface, but do not plow or harrow these areas.

110-2.3 Trees to Remain: As an exception to the above provisions, where so directed by the Engineer, trim, protect, and leave standing desirable trees within the roadway area. Trim branches of trees extending over the area occupied by the roadway as directed, to give a clear

height of 16 feet above the roadway.

110-2.4 Boulders: Remove any boulders encountered in the roadway excavation (other than as permitted under the provisions of 120-7.2) or found on the surface of the ground. When approved by the Engineer place boulders in neat piles inside the right of way. The Contractor may stockpile boulders encountered in Department-furnished borrow areas, which are not suitable for use in the embankment construction, within the borrow area.

110-3 Selective Clearing and Grubbing.

The Contractor shall remove and dispose of all vegetation, obstructions, etc., as provided above except that, where so elected, the Contractor may cut roots, etc., flush with the ground surface. Completely remove and dispose of stumps. Entirely remove undergrowth except in specific areas designated by the Engineer to remain for aesthetic purposes. Trim, protect, and leave standing desirable trees, with the exception of such trees as the Engineer may designate to be removed in order to facilitate right-of-way maintenance. Remove undesirable or damaged trees as so designated by the Engineer. Perform Selective Clearing and Grubbing only in areas so designated in the Plans.

110-4 Protection of Property Remaining in Place.

Protect and do not displace property obstructions which are to remain in place, such as buildings, sewers, drains, water or gas pipes, conduits, poles, walls, posts, bridges, etc.

110-5 Removal of Buildings.

110-5.1 Parts to be Removed: Completely remove all parts of the buildings, including utilities, plumbing, foundations, floors, basements, steps, connecting concrete sidewalks or other pavement, septic tanks, and any other appurtenances, by any practical manner which is not detrimental to other property and improvements. Remove utilities to the point of connection to the utility authority's cut-in. After removing the sewer connections to the point of cut-in, construct a concrete plug at the cut-in point, as directed by the Engineer, except where the utility owners may elect to perform their own plugging. Contact the appropriate utility companies prior to removal of any part of the building to ensure disconnection of services.

110-5.2 Removal by Others: Where buildings within the area to be cleared and grubbed are so specified to be removed by others, remove and dispose of any foundations, curtain walls, concrete floors, basements or other foundation parts which might be left in place after such removal of buildings by others.

110-6 Removal of Existing Structures.

110-6.1 Structures to be Removed: Remove and dispose of the materials from existing structures. Remove the following:

1. those structures, or portions of structures, shown in the Plans to be removed,
2. those structures, or portions of structures, found within the limits of the area to be cleared and grubbed, and directed by the Engineer to be removed,
3. those structures, or portion of structures, which are necessary to be removed in order to construct new structures, and
4. other appurtenances or obstructions which may be designated in the Contract Documents as to be included in an item of payment for the work under this Article.

Provide detailed schedule information to the Engineer 15 working days prior to the commencement of any demolition or renovation of any structures, even if asbestos is not found on the project, for the Engineer's use in notifying the Department of Environmental Protection (DEP) on DEP Form 62-257.900(1) "Notice of Asbestos Renovation or Demolition".

110-6.2 Method of Removal:

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.

110-6.2.2 Removal of Steel Members With Hazardous Coatings: Provide to the Engineer for approval, a copy of the "Contractor's Lead in Construction Compliance Program" from the firm actually removing and disposing of these steel members before any members are disturbed.

Vacuum power tool clean any coated steel member to bare metal as defined by SSPC-SP11 a minimum of 4 inches either side of any area to be heated (torch cutting, sawing, grinding, etc.) in accordance with 29 CFR 1926.354. Abrasive blasting is prohibited. Provide air supplied respirators in accordance with 29 CFR 1926.62 and 29 CFR 1910.134.

110-6.3 Partial Removal of Bridges: On concrete bridges to be partially removed and widened, remove concrete by manually or mechanically operated pavement breakers, by concrete saws, by chipping hammers, or by hydro-demolition methods. Do not use explosives. Where concrete is to be removed to neat lines, use concrete saws or hydro-demolition methods capable of providing a reasonably uniform cleavage face. If the equipment used will not provide a uniform cut without surface spalling, first score the outlines of the work with small trenches or grooves. For all demolition methods, submit for review and approval of the Engineer, a demolition plan that describes the method of removal, equipment to be used, types of rebar splices or couplers, and method of straightening or cutting rebars. In addition, for hydrodemolition, describe the method for control of water or slurry runoff and measures for safe containment of concrete fragments that are thrown out by the hydro-demolition machine.

110-6.4 Authority of U.S. Coast Guard: For structures in navigable waters, when constructing the project under authority of a U.S. Coast Guard permit, the U.S. Coast Guard may inspect and approve the work to remove any existing structures involved therein, prior to acceptance by the Department.

110-6.5 Asbestos Containing Materials (ACM) Not Identified Prior to the Work:

When encountering or exposing any condition indicating the presence of asbestos, cease operations immediately in the vicinity and notify the Engineer.

Make every effort to minimize the disturbance of the ACM. 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. Provisions shall meet all applicable laws, rules or regulations covering hazardous conditions and will be in a manner commensurate with the gravity of the conditions.

The Engineer will notify the District Contamination Assessment Coordinator who will coordinate selecting and tasking the Department's Asbestos Contractor or Contamination Assessment/Remediation Contractor (CAR). Provide access to the potential contamination area. Preliminary investigation by the Asbestos/CAR Contractor will determine the course of action necessary for site security and the steps necessary to resolve the contamination issue.

The Asbestos/CAR Contractor will delineate the contamination areas, any staging or holding area required. Coordinate with the Asbestos/CAR Contractor and the Engineer to develop a work plan that will provide the Asbestos/CAR Contractor's operations schedule with projected completion dates for the final resolution of the contamination issue.

The Asbestos/CAR Contractor will maintain jurisdiction over activities inside any outlined contaminated areas and any associated staging holding areas. The Asbestos/CAR Contractor will be responsible for the health and safety of workers within the delineated areas. Provide continuous access to these areas for the Asbestos/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 Asbestos/CAR Contractor to expedite integration of the Asbestos/CAR Contractor's operations into the construction project. The Prime Contractor is not expected to engage in routine construction activities involving asbestos containing materials.

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.

110-7 Removal of Existing Pavement.

Remove and dispose of existing rigid portland cement concrete pavement, sidewalk, slope pavement, ditch pavement, curb, and curb and gutter etc., where shown in the Plans or ordered by the Engineer to be removed or where required because of the construction operations. Retaining walls, drainage structures and flexible asphalt pavement are not included in the work under this Article.

110-8 Ownership of Materials.

Except as may be otherwise specified in the Contract Documents, the Contractor shall take ownership of all buildings, structures, appurtenances, and other materials removed by him and shall dispose of them in accordance with 110-9.

110-9 Disposal of Materials.

110-9.1 General: Either stack materials designated to remain the property of the Department in neat piles within the right-of-way or load onto the Department's vehicles.

Dispose of timber, stumps, brush, roots, rubbish, and other objectionable material resulting from clearing and grubbing in areas and by methods meeting the applicable requirements of all Local, State and Federal regulations. Do not block waterways by the disposal of debris.

110-9.2 Burning Debris: Where burning of such materials is permitted, perform all such burning in accordance with the applicable laws, ordinances, and regulations. Perform all burning at locations where trees and shrubs adjacent to the cleared area will not be harmed.

110-9.3 Timber and Crops: The Contractor may sell any merchantable timber, fruit trees, and crops that are cleared under the operations of clearing and grubbing for his own benefit, subject to the provisions of 7-1.2, which may require that the timber, fruit trees, or crops be burned at or near the site of their removal, as directed by the Engineer. The Contractor is liable for any claims which may arise pursuant to the provisions of this Subarticle.

110-9.4 Disposal of Treated Wood: Treated wood, including that which comes from bridge channel fender systems, must be handled and disposed of properly during removal. Treated wood should not be cut or otherwise mechanically altered in a manner that would generate dust or particles without proper respiratory and dermal protection. The treated wood must be disposed of in at least a lined solid waste facility or through recycling/reuse. Treated wood shall not be disposed by burning or placement in a construction and demolition (C&D) debris landfill. All compensation for the cost of removal and disposal of treated wood will be included in the Cost of Removal of Existing Structures.

110-9.5 Hazardous Materials/Waste: Handle, transport and dispose of hazardous materials in accordance with all Local, State and Federal requirements including the following:

1. SSPC Guide 7
2. Federal Water Pollution Control Act, and
3. Resource Conservation and Recover Act (RCRA).

Accept responsibility for the collection, sampling, classification, packaging, labeling, accumulation time, storage, manifesting, transportation, treatment and disposal of hazardous waste, both solid and liquid. Separate all solid and liquid waste and collect all liquids used at hygiene stations and handle as hazardous materials/waste. Obtain written approval from the Engineer for all hazardous materials/waste stabilization methods before implementation.

Obtain an EPA/FDEP Hazardous Waste Identification Number (EPA/FDEP ID Number) before transporting and/or disposal of any hazardous materials/waste. List the Department as the generator of all hazardous materials/waste.

Submit the following for the Engineers' approval before transporting, treatment or disposal of any hazardous materials/waste:

1. Name, address and qualifications of the transporter,
2. Name, address and qualifications of the treatment facility,
3. Proposed treatment and/or disposal of all Hazardous Materials/Waste.

Transport all hazardous materials/waste in accordance with applicable 40 CFR 263 Standards. Provide a copy of all completed Hazardous Materials/Waste manifest/bills of lading to the Engineer within 21 days of each shipment.

110-9.5.1 Steel Members With Hazardous Coating: Dispose of steel members with hazardous coating in one of the following manners:

1. Deliver the steel members and other hazardous waste to a licensed recycling or treatment facility capable of processing steel members with hazardous coating.
2. Deliver the steel members with hazardous coating to a site designated by the Engineer for use as an offshore artificial reef. Deliver any other hazardous materials/waste to a licensed hazardous materials/waste recycling treatment facility.

Dismantle and/or cut steel members to meet the required dimensions of the recycling facility, treatment facility or offshore artificial reef agency.

All compensation for the cost of removal and disposal of hazardous materials/waste will be included in the Cost of Removal of Existing Structures.

110-9.5.2 Certification of Compliance: Furnish two copies of Certification of Compliance from the firm actually removing and disposing of the hazardous materials/waste stipulating, the hazardous materials/waste has been handled, transported and disposed of in accordance with this Specification. The Certification of Compliance shall be attested to by a person having legal authority to bind the company.

Maintain all records required by this Specification and ensure these records are available to the Department upon request.

110-10 Miscellaneous Operations.

110-10.1 Water Wells Required to be Plugged: Fill or plug all water wells within the right-of-way, including areas of borrow pits and lateral ditches, that are not to remain in service, in accordance with applicable Water Management District rules or the Department of Environmental Protection regulations.

Cut off the casing of cased wells at least 12 inches below the ground line or 12 inches below the elevation of the finished excavation surface, whichever is lower. Water wells, as referred to herein, are defined either as artesian or non-artesian, as follows:

1. An artesian well is an artificial hole in the ground from which water supplies may be obtained and which penetrates any water-bearing rock, the water in which is raised to the surface by natural flow or which rises to an elevation above the top of the waterbearing bed. Artesian wells are further defined to include all holes drilled as a source of water that penetrate any water-bearing beds that are a part of the artesian water system of Florida, as determined by representatives of the applicable Water Management District.
2. A non-artesian (water-table) well is a well in which the source of water is an unconfined aquifer. The water in a non-artesian well does not rise above the source bed. When the Plans do not indicate whether a non-flowing well is artesian or nonartesian, obtain this information from the Engineer.

110-10.2 Landscape Areas: When certain areas of the right-of-way, outside of the limits of construction, are shown in the Plans or designated by the Engineer to be landscaped, either under the construction Contract or at a later time, remove undesirable trees, stumps, undergrowth, and vegetation, as directed, and preserve and trim natural growth and trees as

directed by the Engineer.

110-10.3 Leveling Terrain: Within the areas between the limits of construction and the outer limits of clearing and grubbing, fill all holes and other depressions, and cut down all mounds and ridges. Make the area of a sufficient uniform contour so that the Department's subsequent mowing and cutting operations are not hindered by irregularity of terrain. Perform this work regardless of whether the irregularities were the result of construction operations or existed originally.

110-10.4 Mailboxes: When the Contract Documents require furnishing and installing mailboxes, permit each owner to remove the existing mailbox. Work with the Local Postmaster to develop a method of temporary mail service for the period between removal and installation of the new mailboxes. Install the mailboxes in accordance with the Design Standards.

110-11 Method of Measurement.

110-11.1 Clearing and Grubbing: When direct payment is provided in the Contract, the quantity to be paid for will be the lump sum quantity.

110-11.2 Removal of Existing Structures: When direct payment is provided in the Contract, the quantity to be paid for will be the lump sum quantity or quantities for the specific structures removed, as designated.

110-11.3 Removal of Existing Pavement: Payment for removal of flexible asphalt pavement is included in the Lump Sum price for Clearing and Grubbing.

No separate payment will be made for removal of curb, sidewalk, slope pavement, or ditch pavement that is removed and replaced, as specified in 520-11, 522-9, and 524-10.

The quantity to be paid for will be the number of square yards of existing pavement of the types listed in 110-7, acceptably removed and disposed of, as specified. The quantity will be determined by actual measurement along the surface of the pavement before its removal. Measurements for appurtenances which have irregular surface configurations, such as curb and gutter, steps, and ditch pavement, will be the area as projected to an approximate horizontal plane. Where the removal of pavement areas is necessary only for the construction of box culverts, pipe culverts, storm sewers, inlets, manholes, etc., these areas will not be included in the measurements.

110-11.4 Plugging Water Wells: When direct payment is provided in the Contract, the quantity to be paid for will be the number of water wells plugged, for each type of well (artesian or non-artesian).

110-11.5 Mailboxes: When direct payment is provided in the Contract, the quantity to be paid for will be the number of mailboxes acceptably furnished and installed.

110-11.6 Delivery of Salvageable Material to the Department When direct payment is provided in the Contract, the quantity to be paid for will be the Lump Sum quantity for delivery of salvageable materials to the Department as indicated in the Plans.

110-11.7 General: In each case, except as provided below, where no item of separate payment for such work is included in the proposal, all costs of such work will be included in the various scheduled items in the Contract, or under specific items as specified herein below or elsewhere in the Contract.

110-12 Basis of Payment.

110-12.1 Clearing and Grubbing:

110-12.1.1 Lump Sum Payment: Price and payment will be full compensation for all clearing and grubbing required for the roadway right-of-way and for lateral ditches, channel changes, or other outfall areas, and any other clearing and grubbing indicated, or required for the construction of the entire project, including all necessary hauling, furnishing equipment, equipment operation, furnishing any areas required for disposal of debris, leveling of terrain and the landscaping work of trimming, etc., as specified herein, except for any areas designated to be paid for separately or to be specifically included in the costs of other work under the Contract.

Where construction easements are specified in the Plans and the limits of clearing and grubbing for such easements are dependent upon the final construction requirements, no adjustment will be made in the lump sum price and payment, either over or under, for variations from the limits of the easement defined in the Plans.

110-12.1.2 When No Direct Payment is Provided: When no item for clearing and grubbing is included in the proposal, the Contractor shall include the cost of any work of clearing and grubbing which is necessary for the proper construction of the project in the Contract price for the structure or other item of work for which such clearing and grubbing is required.

The Contractor shall include the cost of all clearing and grubbing which might be necessary in pits or areas from which base material is obtained in the Contract price for the base in which such material is used. The clearing and grubbing of areas for obtaining stabilizing materials, where required only for the purpose of obtaining materials for stabilizing, will not be paid for separately.

110-12.2 Removal of Existing Structures: Price and payment will be full compensation for all work of removal and disposal of the designated structures.

When direct payment for the removal of existing structures is not provided in the proposal, the Contractor shall include the cost of removing all structures in the Contract price for clearing and grubbing or, if no item of clearing and grubbing is included, in the compensation for the other items covering the new structure being constructed.

110-12.3 Removal of Existing Pavement: Price and payment will be full compensation for performing and completing all the work of removal and satisfactory disposal.

When no separate item for this work is provided and no applicable item of excavation or embankment covering such work (as provided in 120-13.1) is included, the Contractor shall include the costs of this work in the Contract price for the item of clearing and grubbing or for the pipe or other structure for which the pavement removal is required.

110-12.4 Plugging Water Wells: Price and payment will be full compensation for each type of well acceptably plugged.

If a water well requiring plugging is encountered and the Contract contains no price for plugging wells of that specific type, the plugging of such well will be paid for as unforeseeable work.

110-12.5 Mailboxes: Price and payment will be full compensation for all work and materials required, including supports and numbers.

110-12.6 Delivery of Salvageable Material to the Department: Price and payment will be full compensation for all work required for delivery of the materials to the Department.

110-12.7 Payment Items: Payment will be made under:

Item No. 110- 1- Clearing and Grubbing - lump sum.

Item No. 110- 3- Removal of Existing Structures - lump sum.

Item No. 110- 4- Removal of Existing Pavement - per square yard.

Item No. 110- 5- Plugging Water Wells (Artesian) - each.

Item No. 110- 6- Plugging Water Wells (Non-Artesian) - each.

Item No. 110- 7- Mailbox (Furnish and Install) - each.

Item No. 110- 86- Delivery of Salvageable Material to FDOT - lump sum.

SECTION 120 EXCAVATION AND EMBANKMENT

120-1 Description.

120-1.1 General: Excavate and construct embankments as required for the roadway, ditches, channel changes and borrow material. Use suitable excavated material or authorized borrow to prepare subgrades and foundations. Construct embankments in accordance with Design Standards, Index 505. Compact and dress excavated areas and embankments. For excavation and backfilling of structures, comply with the requirements of Section 125. Excavate material for clearing and grubbing in accordance with the requirements of Section 110. Material displaced by the storm sewer or drainage structure system is not included in the earthwork quantities shown in the Plans.

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 areas, 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, surface water 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.

120-2 Classifications of Excavation.

120-2.1 General: The Department may classify excavation specified under this Section for payment as any of the following: regular excavation, subsoil excavation, lateral ditch excavation, and channel excavation.

If the proposal does not show subsoil excavation or lateral ditch excavation as separate items of payment, include such excavation under the item of regular excavation.

If the proposal shows lateral ditch excavation as a separate item of payment, but does not show channel excavation as a separate item of payment, include such excavation under the item of lateral ditch excavation. Otherwise, include channel excavation under the item of regular excavation.

120-2.2 Regular Excavation: Regular excavation includes roadway excavation and borrow excavation, as defined below for each.

120-2.2.1 Roadway Excavation: Roadway excavation consists of the excavation and the utilization or disposal of all materials necessary for the construction of the roadway, ditches, channel changes, etc., except as may be specifically shown to be paid for separately and that portion of the lateral ditches within the limits of the roadway right-of-way as shown in the Plans.

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 (CSIP) submittal based on using borrow material from within the project limits will not be considered.

120-2.3 Subsoil Excavation: Subsoil excavation consists of the excavation and disposal of muck, clay, rock, or any other material that is unsuitable in its original position and that is excavated below the finished grading template. For stabilized bases and sand bituminous road mixes, consider the finished grading template as the top of the finished base, shoulders and slopes. For all other bases and rigid pavement, consider the finished grading template as the finished shoulder and slope lines and bottom of completed base or rigid pavement. For pond and ditches that identify the placement of a blanket material, consider the finished grading template as the bottom of the blanket material. Subsoil excavation also consists of the excavation of all suitable material within the above limits as necessary to excavate the unsuitable material. Consider the limits of subsoil excavation indicated in the Plans as being particularly variable, in accordance with the field conditions actually encountered.

The quantity of material required to replace the excavated material and to raise the elevation of the roadway to the bottom of the template will be paid for under embankment or borrow excavation (Truck Measure).

120-2.4 Lateral Ditch Excavation: Lateral ditch excavation consists of all excavation of inlet and outlet ditches to structures and roadway, changes in channels of streams, and ditches parallel to the roadway right-of-way. Dress lateral ditches to the grade and cross-section shown in the Plans.

120-2.5 Channel Excavation: Channel excavation consists of the excavation and satisfactory disposal of all materials from the limits of the channel as shown in the Plans.

120-3 Preliminary Soils Investigations.

When the Plans contain the results of a soil survey, do not assume such data is a guarantee of the depth, extent, or character of material present.

120-4 Removal of Unsuitable Materials and Existing Roads.

120-4.1 Subsoil Excavation: Where muck, rock, clay, or other material within the limits of the roadway is unsuitable in its original position, excavate such material to the cross-sections shown in the Plans or indicated by the Engineer, and backfill with suitable material. Shape backfill material to the required cross-sections. Where the removal of plastic soils below the

finished earthwork grade is required, meet a construction tolerance, from the lines shown in the plans as the removal limits, of plus or minus 0.2 feet in depth and plus or minus 6 inches (each side) in width.

120-4.2 Construction over Existing Old Road: Where a new roadway is to be constructed over an old one, plow or scarify the old road, and break it up full width, regardless of height of fill. If the Plans provide that paving materials may be incorporated into the fill, distribute such material in a manner so as not to create voids. Recompact the old road meeting the requirements of 120-10.2.

120-4.3 Obliterating Old Road: Where the Plans call for obliteration of portions of an old road outside of the proposed new roadway, obliterate such sections of the old road by grading to fill ditches and to restore approximately the original contour of the ground or a contour which produces a pleasing appearance.

120-5 Disposal of Surplus and Unsuitable Material.

120-5.1 Ownership of Excavated Materials: Dispose of surplus and excavated materials as shown in the Plans or, if the Plans do not indicate the method of disposal, take ownership of the materials and dispose of them outside the right-of-way.

120-5.2 Disposal of Muck on Side Slopes: As an exception to the provisions of 120-5. 1, when approved by the Engineer, in rural undeveloped areas, the Contractor may place muck (A-8 material) on the slopes, or store it alongside the roadway, provided there is a clear distance of at least 6 feet between the roadway grading limits and the muck, and the Contractor dresses the muck to present a neat appearance. In addition, the Contractor may also dispose of this material by placing it on the slopes in developed areas where, in the opinion of the Engineer, this will result in an aesthetically pleasing appearance and will have no detrimental effect on the adjacent developments. Where the Engineer permits the disposal of muck or other unsuitable material inside the right-of-way limits, do not place such material in a manner which will impede the inflow or outfall of any channel or side ditches. The Engineer will determine the limits adjacent to channels within which such materials may be disposed.

120-5.3 Disposal of Paving Materials: Unless otherwise noted, take ownership of paving materials, such as paving brick, asphalt block, concrete slab, sidewalk, curb and gutter, etc., excavated in the removal of existing pavements, and dispose of them outside the right-of-way. If the materials are to remain the property of the Department, place them in neat piles as directed. Existing limerock base that is removed may be incorporated in the stabilized portion of the subgrade. If the construction sequence will allow, incorporate all existing limerock base into the project as allowed by the Contract Documents.

120-5.4 Disposal Areas: Where the Contract Documents require disposal of excavated materials outside the right-of-way, and the disposal area is not indicated in the Contract Documents, furnish the disposal area without additional compensation.

Provide areas for disposal of removed paving materials out of sight of the project and at least 300 feet from the nearest roadway right-of-way line of any State maintained road. If the materials are buried, disregard the 300 foot limitation.

120-6 Borrow.

120-6.1 Materials for Borrow: Do not open borrow pits until the Engineer has approved their location.

Do not provide borrow materials that are polluted as defined in Chapter 376 of the Florida Statutes (oil of any kind and in any form, gasoline, pesticides, ammonia, chlorine, and derivatives thereof, excluding liquefied petroleum gas) in concentrations above any local, State, or Federal standards.

Prior to placing any borrow material that is the product of soil incineration, provide the Engineer with a copy of the Certificate of Materials Recycling and Post Burn Analysis showing that the material is below all allowable pollutant concentrations.

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 (CRA) 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 and 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 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 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.

120-6.3 Borrow Material for Shoulder Build-up: When so indicated in the Plans, furnish borrow material with a specific minimum bearing value, for building up of existing

shoulders. Blend materials as necessary to achieve this specified minimum bearing value prior to placing the materials on the shoulders. Take samples of this borrow material at the pit or blended stockpile. Include all costs of providing a material with the required bearing value in the Contract unit price for borrow material.

120-6.4 Haul Routes for Borrow Pits: Provide and maintain, at no expense to the Department, all necessary roads for hauling the borrow material. Where borrow area haul roads or trails are used by others, do not cause such roads or trails to deteriorate in condition.

Arrange for the use of all non-public haul routes crossing the property of any railroad. Incur any expense for the use of such haul routes. Establish haul routes which will direct construction vehicles away from developed areas when feasible, and keep noise from hauling operations to a minimum. Advise the Engineer in writing of all proposed haul routes.

120-6.5 Authorization for Use of Borrow: When the item of borrow excavation is included in the Contract, use borrow only when sufficient quantities of suitable material are not available from roadway and drainage excavation, to properly construct the embankment, subgrade, and shoulders, and to complete the backfilling of structures. Do not use borrow material until so ordered by the Engineer, and then only use material from approved borrow pits.

120-7 Materials for Embankment.

120-7.1 Use of Materials Excavated From the Roadway and Appurtenances: Assume responsibility for determining the suitability of excavated material for use on the project in accordance with the applicable Contract Documents. Consider the sequence of work and maintenance of traffic phasing in the determination of the availability of this material.

120-7.2 General Requirements for Embankment Materials: Construct embankments of acceptable material including reclaimed asphalt pavement (RAP), recycled concrete aggregate (RCA) and portland cement concrete rubble, but containing no muck, stumps, roots, brush, vegetable matter, rubbish, reinforcement bar or other material that does not compact into a suitable and enduring roadbed. Do not use RAP or RCA in the top 3 feet of slopes and shoulders that are to be grassed or have other type of vegetation established. Do not use RAP or RCA in stormwater management facility fill slopes.

Remove all waste material designated as undesirable. Use material in embankment construction in accordance with plan details or as the Engineer directs.

Complete the embankment using maximum particle sizes (in any dimension) as follows:

1. In top 12 inches: 3-1/2 inches (in any dimension).
 2. 12 to 24 inches: 6 inches (in any dimension).
 3. In the depth below 24 inches: not to exceed 12 inches (in any dimension) or the compacted thickness of the layer being placed, whichever is less.
- Spread all material so that the larger particles are separated from each other to minimize voids between them during compaction. Compact around these rocks in accordance with 120-9.2.

When and where approved by the Engineer, the Contractor may place larger rocks (not to exceed 18 inches in any dimension) outside the one to two slope and at least 4 feet or more below the bottom of the base. Compact around these rocks to a firmness equal to that of the supporting soil. Construct grassed embankment areas in accordance with 120-9.2.6. Where constructing embankments adjacent to bridge end bents or abutments, do not place rock larger than 3-1/2 inches in diameter within 3 feet of the location of any end-bent piling.

120-7.3 Materials Used at Pipes, Culverts, etc.: Construct embankments over and around pipes, culverts, and bridge foundations with selected materials.

120-8 Embankment Construction.

120-8.1 General: Construct embankments in sections of not less than 300 feet in length or for the full length of the embankment..

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, shared use paths, and sidewalks areas, a LOT is defined as a single lift of finished embankment not to exceed 2000 feet.

Isolated compaction operations will be considered as separate LOTS. For multiple phase construction, a LOT shall not extend beyond the limits of the phase.

120-8.2 Dry Fill Method:

120-8.2.1 General: Construct embankments to meet compaction requirements in Article 120-9 and in accordance with the acceptance program requirements in 120-10. Restrict the compacted thickness of the last embankment lift to 6 inches maximum.

120-8.2.1.1 For A-3 Materials and for A-2-4 Materials (with up to 15% fines): Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 12 inches. Ensure the percentage of fines passing the No. 200 US Standard sieve in the A-2-4 material does not exceed 15%.

120-8.2.1.2 For A-1, Plastic materials (as designated in Design Standard Index 505) and for A-2-4 Materials (with greater than 15% fines): Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 6 inches. Alternately, for A-1, Plastic material and for A-2-4 Materials (with greater than 15% fines), construct embankments using thick lift construction in successive layers of not more than 12 inches compacted thickness, after having demonstrated with a successful test section, the possession and control of compacting equipment sufficient to achieve density required by 120-10.2 for the full depth of a thicker lift, and if the Engineer approves the compaction effort. Notify the Engineer prior to beginning construction of a test section. Construct a test section of the length of one full LOT. Perform five QC tests at random locations within the test section. All five QC tests and a Department Verification test must meet the density required by 120-10.2. Identify the test section with the compaction effort and soil classification in the Density Log Book. In case of a change in compaction effort or soil classification, failing QC test or when the QC tests cannot be verified, construct a new test section. The Contractor may elect to place material in 6 inches compacted thickness at any time. Construct all layers approximately parallel to the centerline profile of the road.

The Engineer reserves the right to terminate the Contractor's use of thick lift construction. Whenever the Engineer determines that the Contractor is not achieving satisfactory results, revert to the 6 inch compacted lifts.

As far as practicable, distribute traffic over the work during the construction of embankments so as to cover the maximum area of the surface of each layer. Construct embankment in the dry whenever normal dewatering equipment and methods can accomplish the needed dewatering.

120-8.2.1.3 Equipment and Methods: Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, sumps and siphons.

When normal dewatering does not adequately remove the water, the Engineer may require the embankment material to be placed in the water or on low swampy ground in accordance with 120-9.2.3.

120-8.2.2 Placing in Unstable Areas: Where depositing the material in water, or on low swampy ground that will not support the weight of hauling equipment, construct the embankment by dumping successive loads in a uniformly distributed layer of a thickness not greater than necessary to support the hauling equipment while placing subsequent layers. Once sufficient material has been placed so that the hauling equipment can be supported, construct the remaining portion of the embankment in layers in accordance with the applicable provisions of 120-9.2.2 and 120-9.2.4.

120-8.2.3 Placing on Steep Slopes: When constructing an embankment on a hillside sloping more than 20 degrees from the horizontal, before starting the fill, deeply plow or cut steps into the surface of the original ground on which the embankment is to be placed.

120-8.2.4 Placing Outside Standard Minimum Slope: The standard minimum slope is defined as the plane described by a two (horizontal) to one (vertical) slope downward from the roadway shoulder line or the gutter line, as applicable. Where material that is unsuitable for normal embankment construction is to be used in the embankment outside the standard minimum slope, place such material in layers of not more than 18 inches in thickness, measured loose. The Contractor may also place material which is suitable for normal embankment, outside such standard minimum slope, in 18 inch layers. Maintain a constant thickness for suitable material placed within and outside the standard minimum slope, unless placing in a separate operation.

120-8.3 Hydraulic Method:

120-8.3.1 Method of Placing: When the hydraulic method is used, as far as practicable, place all dredged material in its final position in the embankment by such method. Place and compact any dredged material that is rehandled, or moved and placed in its final position by any other method, as specified in 120-9.2. The Contractor may use baffles or any form of construction he may select provided the slopes of the embankments are not steeper than indicated in the Plans. Remove all timber used for temporary bulkheads or baffles from the embankment, and fill and thoroughly compact the holes thus formed. When placing fill on submerged land, construct dikes prior to beginning of dredging, and maintain the dikes throughout the dredging operation.

120-8.3.2 Excess Material: Do not use excess material placed outside the prescribed slopes, below the normal high-water level, to raise the fill. Remove only the portion of this material required for dressing the slopes.

120-8.3.3 Protection of Openings in Embankment: Leave openings in the embankments at the bridge sites. Remove any material which invades these openings or existing channels without additional compensation to provide the same depth of channel as existed before the construction of the embankment. Do not excavate or dredge any material within 200 feet of the toe of the proposed embankment.

120-8.4 Reclaimed Asphalt Pavement (RAP) Method:

120-8.4.1 General: Use only RAP material stored at facilities with an approved Florida Department of Environmental Protection Stormwater permit or, 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: construction areas that are below the seasonal high groundwater table elevation; MSE Wall backfill; underneath MSE Walls or 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 8 to 10 inches thick. After mixing, meet all embankment utilization requirements of Design Standards, Index No. 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.

120-9 Compaction Requirements.

120-9.1 Moisture Content: Compact the materials at a moisture content such that the specified density can be attained. If necessary to attain the specified density, add water to the material, or lower the moisture content by manipulating the material or allowing it to dry, as is appropriate.

120-9.2 Compaction of Embankments:

120-9.2.1 General: Uniformly compact each layer, using equipment that will achieve the required density, and as compaction operations progress, shape and manipulate each layer as necessary to ensure uniform density throughout the embankment.

120-9.2.2 Compaction Over Unstable Foundations: Where the embankment material is deposited in water or on low swampy ground, and in a layer thicker than 12 inches (as provided in 120-8.2.2), compact the top 6 inches (compacted thickness) of such layer to the density as specified in 120-10.2.

120-9.2.3 Compaction Where Plastic Material Has Been Removed: Where unsuitable material is removed and the remaining surface is of the A-4, A-5, A-6, or A-7 Soil Groups (see AASHTO M-145), as determined by the Engineer, compact the surface of the excavated area by rolling with a sheepsfoot roller exerting a compression of at least 250 psi on the tamper feet, for the full width of the roadbed (subgrade and shoulders). Perform rolling before beginning any backfill, and continue until the roller feet do not penetrate the surface more than 1 inch. Do not perform such rolling where the remaining surface is below the normal water table and covered with water. Vary the procedure and equipment required for this operation at the discretion of the Engineer.

120-9.2.4 Compaction of Material To Be Used In Base, Pavement, or Stabilized Areas: Do not compact embankment material which will be incorporated into a pavement, base course, or stabilized subgrade, to be constructed as a part of the same Contract.

120-9.2.5 Compaction of Grassed Shoulder Areas: For the upper 6 inch layer of all shoulders which are to be grassed, since no specific density is required, compact only to the extent directed.

120-9.2.6 Compaction of Grassed Embankment Areas: For the outer layer of all embankments where plant growth will be established, do not compact. Leave this layer in a loose condition to a minimum depth of 6 inches for the subsequent seeding or planting operations.

120-9.3 Compaction for Pipes, Culverts, etc.: Compact the backfill of trenches to the densities specified for embankment or subgrade, as applicable, and in accordance with the requirements of 125-9.2.

Thoroughly compact embankments over and around pipes, culverts, and bridges in a manner which will not place undue stress on the structures, and in accordance with the requirements of 125-9.2.

120-9.4 Compaction of Subgrade: If the Plans do not provide for stabilizing, compact the subgrade (as defined in 1-3) in both cuts and fills, to the density specified in 120-10.2. For undisturbed soils, do not apply density requirements where constructing narrow widening strips or paved shoulders 5 feet or less in width.

Where trenches for widening strips are not of sufficient width to permit the use of standard compaction equipment, perform compaction using vibratory rollers, trench rollers, or

other type compaction equipment approved by the Engineer. Maintain the required density until the base or pavement is placed on the subgrade.

120-10 Acceptance Program.

120-10.1 General Requirements:

120-10.1.1 Initial Equipment Comparison: Before initial production, perform a comparison test using the QC, Verifications and Independent Assurance gauges. Unless the Engineer instructs, do not perform the initial equipment comparison more than once per project. When comparing the computed dry density of one nuclear gauge to a second gauge, ensure that the difference between the two computed dry densities does not exceed 2 lb/ft³ between gauges from the same manufacturer, and 3 lb/ft³ between gauges from different manufacturers. Repair or replace any QC gauge that does not compare favorably with the IA gauge.

Perform a comparison analysis between the QC nuclear gauge and the Verification nuclear gauge any time a nuclear gauge or repaired nuclear gauge is first brought to the project. Repair and replace any QC gauge that does not compare favorably with the Verification gauge at any time during the remainder of the project. Calibrate all QC gauges annually.

120-10.1.2 Initial Production Lot: Before construction of any other LOT, prepare a 500 foot initial control section consisting of one full LOT. Notify the Engineer at least 24 hours prior to production of the initial control section. Perform all QC tests required in 120-10.1.4. When the initial QC test results pass specifications, the Engineer will perform a Verification test to verify compliance with the specifications. Do not begin constructing another LOT until successfully completing the initial production LOT. The Engineer will notify the Contractor of the initial production lot approval within three working days after receiving the Contractor's QC data when test results meet the following conditions:

1. QC tests must meet the specifications.
2. Verification test must meet the specifications.
3. Difference between QC and Verification computed dry density results shall meet the requirements of 120-10.1.1.

If Verification test result fails the density requirements of 120-10.2, correct the areas of non-compliance. The QC and Verification tests will then be repeated.

120-10.1.3 Density over 105%: When a QC computed dry density results in a value greater than 105% of the applicable Proctor maximum dry density, the Engineer will perform an Independent Verification density test within 5 feet. If the Independent Verification density results in a value greater than 105%, the Engineer will investigate the compaction methods, examine the applicable Standard Proctor Maximum Density and material description. The Engineer may collect and test an Independent Verification Standard Proctor Maximum Density sample for acceptance in accordance with the criteria of 120-10.2.

120-10.1.4 Quality Control (QC) Tests:

120-10.1.4.1 Standard Proctor Maximum Density Determination:

Determine the QC standard Proctor maximum density and optimum moisture content by sampling and testing the material in accordance with the specified test method listed in 120-10.2.

120-10.1.4.2 Density Testing Requirements: Ensure compliance to the requirements of 120-10.2 by Nuclear Density testing in accordance with FM 1-T 238. Determine the in-place moisture content for each density test. Use FM 1-T 238, FM 5-507 (Determination of Moisture Content by Means of a Calcium Carbide Gas Pressure Moisture Tester), or ASTM D-4643 (Laboratory Determination of Moisture Content of Granular Soils by use of a Microwave Oven) for moisture determination.

120-10.1.4.3 Soil Classification: Perform soil classification tests on the sample collected in 120-10.1.4.1, in accordance with AASHTO T-88. Classify soils in accordance with AASHTO M-145 in order to determine compliance with embankment

utilization requirements. Unless required by the Engineer, do not test or classify materials for stabilized subgrade or base.

120-10.1.5 Department Verification: The Engineer will conduct Verification tests in order to accept all materials and work associated with 120-10.1.4. The Engineer will verify the QC results if they meet the Verification Comparison Criteria, otherwise the Engineer will implement Resolution procedures.

The Engineer will select test locations, including Station, Offset, and Lift, using a Random Number generator based on the Lots under consideration. Each Verification test evaluates all work represented by the QC testing completed in those LOTS.

In addition to the Verification testing, the Engineer may perform additional Independent Verification (IV) testing. The Engineer will evaluate and act upon the IV test results in the same manner as Verification test results.

When the project requires less than four QC tests per material type, the Engineer reserves the right to accept the materials and work through visual inspection.

120-10.1.6 Reduced Testing Frequency: When no Resolution testing is required for 12 consecutive verified LOTS; or if required, the QC test data was upheld, reduce the QC 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 QC 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 LOTS. If the Verification test fails, and QC test data is not upheld by Resolution testing, the QC testing will revert to the original frequency of one QC test per LOT. Do not apply reduced testing frequency in construction of shoulder-only areas, shared use paths and sidewalks.

120-10.1.7 Payment for Resolution Tests: If the Resolution laboratory results compare favorably with the QC 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 QC 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.

120-10.2 Acceptance Criteria: Obtain a minimum QC density of 100% of the standard Proctor maximum density as determined by AASHTO T-99, Method C, with the following exceptions: embankment constructed by the hydraulic method as specified in 120-8.3; material placed outside the standard minimum slope as specified in 120-8.2.4 except when a structure is supported on existing embankment; and, other areas specifically excluded herein.

120-10.3 Additional Requirements:

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,
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

120-10.3.2 Test Selection and Reporting: Determine test locations including

Stations and offsets, using the random number generator approved by the Engineer. Do not use note pads or work sheets to record data for later transfer to the Density Log Book. Notify the Engineer upon successful completion of QC testing on each LOT.

120-10.4 Verification Comparison Criteria and Resolution Procedures:

120-10.4.1 Standard Proctor Maximum Density Determination: The Engineer

will verify the QC results if the results compare within 4.5 lb/ft³ of the Verification test result.

Otherwise, the Engineer will take one additional sample of material from the soil type in question. The State Materials Office (SMO) or an AASHTO accredited laboratory designated by the SMO will perform Resolution testing. The material will be sampled and tested in accordance with AASHTO T-99, Method C.

The Engineer will compare the Resolution test results with the QC test results. If all Resolution test results are within 4.5 lb/ft³ of the corresponding QC test results, the Engineer will use the QC test results for material acceptance purposes for each LOT with that soil type. If the Resolution test result is not within 4.5 lb/ft³ of the Contractor's QC test, the Verification test result will be used for material acceptance purposes.

120-10.4.2 Density Testing: When a Verification or Independent Verification

density test fails the Acceptance Criteria, retest the site within a 5 feet radius and the following actions will be taken:

1. If the QC retest meets the Acceptance Criteria and meets the 120-10.1.1 criteria when compared with the Verification or Independent Verification test, the Engineer will accept those LOTS.
2. If the QC retest does not meet the Acceptance Criteria and compares favorably with the Verification or Independent Verification test, rework and retest the LOT. The Engineer will re-verify those LOTS.
3. If the QC retest and the Verification or Independent Verification test do not compare favorably, complete a new comparison analysis as defined in 120-10.1.1. Once acceptable comparison is achieved, retest the LOTS. The Engineer will perform new verification testing. Acceptance testing will not begin on a new LOT until the Contractor has a gauge that meets the comparison requirements.

Record QC test results in the density log book on approved

Department forms provided by the Engineer. Submit the original, completed density log book to the Engineer at final acceptance.

120-10.4.3 Soil Classification: The Engineer will verify the QC results if the

Verification results identify matching soil classifications. Otherwise, the Engineer will take one additional sample of material from the soil type in question. The SMO or an AASHTO accredited laboratory designated by the SMO will perform Resolution testing. The material will be sampled and tested in accordance with AASHTO T-88.

The Engineer will compare the Resolution test results with the QC test

results. If the Resolution test matches the QC classification, the Engineer will use the QC classification for material acceptance purposes. If the Resolution test result does not match the Contractor's QC classification, the Verification test result will be used for material acceptance purposes.

120-11 Maintenance and Protection of Work.

While construction is in progress, maintain adequate drainage for the roadbed at all times. Maintain a shoulder at least 3 feet wide adjacent to all pavement or base construction in order to provide support for the edges.

Maintain all earthwork construction throughout the life of the Contract, and take all reasonable precautions to prevent loss of material from the roadway due to the action of wind or water. Repair, at no expense to the Department except as otherwise provided herein, any slides, washouts, settlement, subsidence, or other mishap which may occur prior to final acceptance of the work. Perform maintenance and protection of earthwork construction in accordance with Section 104.

Maintain all channels excavated as a part of the Contract work against natural shoaling or other encroachments to the lines, grades, and cross-sections shown in the Plans, until final acceptance of the project.

120-12 Construction.

120-12.1 Construction Tolerances: Shape the surface of the earthwork to conform to the lines, grades, and cross-sections shown in the Plans. In final shaping of the surface of earthwork, maintain a tolerance of 0.3 foot above or below the plan cross-section with the following exceptions:

1. Shape the surface of shoulders to within 0.1 foot of the plan cross-section.
2. Shape the earthwork to match adjacent pavement, curb, sidewalk, structures, etc.
3. Shape the bottom of ditches so that the ditch impounds no water.
4. When the work does not include construction of base or pavement, shape the entire roadbed (shoulder point to shoulder point) to within 0.1 foot above or below the Plan cross-section.

Ensure that the shoulder lines do not vary horizontally more than 0.3 foot from the true lines shown in the Plans.

120-12.2 Operations Adjacent to Pavement: Carefully dress areas adjacent to pavement areas to avoid damage to such pavement. Complete grassing of shoulder areas prior to placing the final wearing course. Do not manipulate any embankment material on a pavement surface.

When shoulder dressing is underway adjacent to a pavement lane being used to maintain traffic, exercise extreme care to avoid interference with the safe movement of traffic.

120-13 Method of Measurement.

120-13.1 General: When payment for excavation is on a volumetric basis, the quantity to be paid for will be the volume, in cubic yards, calculated by the method of average end areas, unless the Engineer determines that another method of calculation will provide a more accurate result. The material will be measured in its original position by field survey or by photogrammetric means as designated by the Engineer, unless otherwise specified under the provisions for individual items.

Where subsoil excavation extends outside the lines shown in the Plans or authorized by the Engineer including allowable tolerances, and the space is backfilled with material obtained in additional authorized roadway or borrow excavation, the net fill, plus shrinkage allowance, will be deducted from the quantity of roadway excavation or borrow excavation to be paid for, as applicable.

The quantity of all material washed, blown, or placed beyond the authorized roadway cross-section will be determined by the Engineer and will be deducted from the quantity

of roadway excavation or borrow excavation to be paid for, as applicable.

Subsoil excavation that extends outside the lines shown in the Plans or authorized by the Engineer including allowable tolerances will be deducted from the quantity to be paid for as subsoil excavation.

120-13.2 Roadway Excavation: The measurement will include only the net volume of material excavated between the original ground surface and the surface of the completed earthwork, except that the measurement will also include all unavoidable slides which may occur in connection with excavation classified as roadway excavation.

The pay quantity will be the plan quantity provided that the excavation was accomplished in substantial compliance with the plan dimensions and subject to the provisions of 9-3.2 and 9-3.4. On designated 3-R Projects, regular excavation will be paid for at the Contract lump sum price provided that the excavation was accomplished in substantial compliance with the plan dimension.

120-13.3 Borrow Excavation: Measurement will be made on a loose volume basis, measured in trucks or other hauling equipment at the point of dumping on the road. If measurement is made in vehicles, level the material to facilitate accurate measurement.

Unsuitable material excavated from borrow pits where truck measurement is provided for and from any borrow pits furnished by the Contractor, will not be included in the quantity of excavation to be paid for.

120-13.4 Lateral Ditch Excavation: The measurement will include only material excavated within the lines and grades indicated in the Plans or as directed by the Engineer. The measurement will include the full station-to-station length shown in the Plans or directed by the Engineer and acceptably completed. Excavation included for payment under Section 125 will not be included in this measurement.

The pay quantity will be the plan quantity provided that the excavation was accomplished in substantial compliance with the plan dimensions and subject to the provisions of 9-3.2 and 9-3.4.

120-13.5 Channel Excavation: The measurement will include only material excavated within the lines and grades indicated in the Plans or in accordance with authorized Plan changes. The measurement will include the full station-to-station length shown in the Plans including any authorized changes thereto.

If shoaling occurs subsequent to excavation of a channel and the Engineer authorized the shoaled material to remain in place, the volume of any such material remaining within the limits of channel excavation shown in the Plans will be deducted from the measured quantity of channel excavation.

120-13.6 Subsoil Excavation: The measurement will include only material excavated within the lines and grades indicated in the Plans (including the tolerance permitted therefore) or as directed by the Engineer.

When no item for subsoil excavation is shown in the Contract but subsoil excavation is subsequently determined to be necessary, such unanticipated subsoil excavation will be paid for as provided in 4-4.

120-13.7 Embankment: The quantity will be at the plan quantity.

Where payment for embankment is not to be included in the payment for the excavation, and is to be paid for on a cubic yard basis for the item of embankment, the plan quantities to be paid for will be calculated by the method of average end areas unless the Engineer determines that another method of calculation will provide a more accurate result. The measurement will include only material actually placed above the original ground line, within the lines and grades indicated in the Plans or directed by the Engineer. The length used in the computations will be the station-to-station length actually constructed. The original ground line used in the computations will be as determined prior to placing of embankment subject to the provisions of 9-3.2, and no allowance will be made for subsidence of material below the surface

of the original ground.

If there are authorized changes in plan dimensions or if errors in plan quantities are detected, plan quantity will be adjusted as provided in 9-3.2.

Where the work includes excavation of unsuitable material below the finished grading template or original ground line, whichever is lower as defined in 120-3.3, the original ground line is defined as the surface prior to beginning excavation, except that this surface is not outside the permissible tolerance of lines and grades for subsoil excavation as indicated in the Plans or as directed by the Engineer. Any overrun or underrun of plan quantity for subsoil excavation which results in a corresponding increase or decrease in embankment will be considered as an authorized plan change for adjustment purposes as defined in 9-3.2.2.

No payment will be made for embankment material used to replace unsuitable material excavated beyond the lines and grades shown in the Plans or ordered by the Engineer. In no case will payment be made for material allowed to run out of the embankment on a flatter slope than indicated on the cross-section. The Contractor shall make his own estimate on the volume of material actually required to obtain the pay section.

120-14 Basis of Payment.

120-14.1 General: Prices and payments for the various work items included in this Section will be full compensation for all work described herein, including excavating, dredging, hauling, placing, and compacting; dressing the surface of the earthwork; maintaining and protecting the complete earthwork; and hauling.

The Department will not allow extra compensation for any rehandling of materials.

The Department will compensate for the cost of grassing or other permanent erosion control measures directed by the Engineer as provided in the Contract for similar items of roadway work.

120-14.2 Excavation:

120-14.2.1 Items of Payment: When no classification of material is indicated in the Plans, and bids are taken only on regular excavation, the total quantity of all excavation specified under this Section will be paid for at the Contract unit price for regular excavation. When separate classifications of excavation are shown in the proposal, the quantities of each of the various classes of materials so shown will be paid for at the Contract unit prices per cubic yard for regular excavation, lateral ditch excavation, subsoil excavation, and channel excavation, as applicable, and any of such classifications not so shown will be included under the item of regular excavation (except that if there is a classification for lateral ditch excavation shown and there is no classification for channel excavation, any channel excavation will be included under the item of lateral ditch excavation). As an exception on designated projects, regular excavation will be paid for at the Contract lump sum price.

120-14.2.2 Basic Work Included in Payments: Prices and payments will be full compensation for all work described under this Section, except for any excavation, or embankment which is specified to be included for payment under other items. Such prices and payments will include hauling; any rehandling that may be necessary to accomplish final disposal as shown in the Plans; the dressing of shoulders, ditches and slopes; removal of trash, vegetation, etc., from the previously graded roadway where no item for clearing and grubbing is shown in the Plans; and compacting as required.

120-14.2.3 Additional Depth of Subsoil Excavation: Where subsoil excavation is made to a depth of 0 to 5 feet below the depth shown in the Plans, such excavation will be paid for at the unit price bid.

Where subsoil excavation is made to a depth greater than 5 feet, and up to 15 feet, deeper than the depth shown in the Plans, such excavation will be paid for at the unit price bid plus 25% of such unit price. Additional extra depth, more than 15 feet below such plan depth, will be considered as a change in the character of the work and will be paid for as

unforeseeable work.

Where no subsoil excavation is shown in a particular location on the original Plans, payment for extra depth of subsoil will begin 5 feet below the lowest elevation on the grading template.

120-14.2.4 Borrow Excavation: When the item of borrow excavation is included in the Contract, price and payment will also include the cost of furnishing the borrow areas and any necessary clearing and grubbing thereof, the removal of unsuitable material that it is necessary to excavate in order to obtain suitable borrow material, and also the costs incurred in complying with the provisions of 120-6.3.

120-14.2.5 Materials Excluded from Payment for the Excavation: No payment for excavation will be made for any excavation covered for payment under the item of embankment.

No payment will be made for the excavation of any materials which is used for purposes other than those shown in the Plans or designated by the Engineer. No payment will be made for materials excavated outside the lines and grades given by the Engineer, unless specifically authorized by the Engineer. As an exception, in operations of roadway excavation, all slides and falls of insecure masses of material beyond the regular slopes that are not due to lack of precaution on the part of the Contractor, will be paid for at the Contract unit price for the material involved. The removal of slides and falls of material classified as lateral ditch excavation or as subsoil excavation will not be paid for separately, but will be included in the Contract unit price for the pay quantity of these materials, measured as provided in 120-14.

120-14.3 Embankment:

120-14.3.1 General: Price and payment will be full compensation for all work specified in this Section, including all material for constructing the embankment, all excavating, dredging, pumping, placing and compacting of material for constructing the embankment complete, dressing of the surface of the roadway, maintenance and protection of the completed earthwork, and the removal of rubbish, vegetation, etc., from the roadway where no clearing and grubbing of the area is specified in the Plans. Also, such price and payment, in each case, will specifically include all costs of any roadway, lateral ditch, or channel excavation, unless such excavation is specifically shown to be paid for separately, regardless of whether the materials are utilized in the embankment.

120-14.3.2 Excluded Material: No payment will be made for the removal of muck or overburden from the dredging or borrow areas. No payment will be made for embankment material used to replace muck or other unsuitable material excavated beyond the lines and grades shown in the Plans or ordered by the Engineer.

120-14.3.3 Clearing and Grubbing: No payment will be made for any clearing and grubbing of the borrow or dredging areas. Where no clearing and grubbing of such areas is specified in the Plans, the cost of any necessary clearing and grubbing will be included in the Contract unit or lump sum price for Embankment.

120-14.3.4 Cost of Permits, Rights, and Waivers: Where the Contractor provides borrow or dredging areas of his own choosing, the cost of securing the necessary permits, rights or waivers will be included in the Contract price for embankment.

120-14.4 Payment Items: Payment will be made under:

Item No. 120- 1- Regular Excavation - per cubic yard.

Item No. 120- 2- Borrow Excavation - per cubic yard.

Item No. 120- 3- Lateral Ditch Excavation - per cubic yard.

Item No. 120- 4- Subsoil Excavation - per cubic yard.

Item No. 120- 5- Channel Excavation - per cubic yard.

Item No. 120- 6- Embankment - per cubic yard.

Item No. 120- 71- Regular Excavation (3-R Projects) - lump sum.

SECTION 121
FLOWABLE FILL
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(1)	Section 902
Portland Cement (Types I, II, or III)	Section 921
Water	Section 923
Admixtures(2).....	Section 924
Ground Tire Rubber (GTR)(3)	Section 919
Fly Ash, Slag and other Pozzolanic Materials	Section 929
Preformed Foam	ASTM C 869

1. 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.
2. 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. GTR may reduce the amount of high air generators or foaming agents used.
3. GTR may replace up to 20% of the fine aggregate.

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/yd³ 75-150 lb/yd³ Min 150 lb/yd³
Pozzolans or Slag None 150-600 lb/yd³ 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/ft³ 100-125 lb/ft³ 20-80 lb/ft³

Fine Aggregate *** ** Optional

Excavatable Non-Excavatable Cellular Concrete

*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.

Submit 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.

SECTION 162 PREPARED SOIL LAYER

162-1 Description.

162-1.1 Finish Soil Layer: Unless otherwise called for in the Plans, prepare a 6 inch thick layer of existing soil mixed with imported material, if necessary, to achieve the pH and organic matter levels required in Section 987, that is favorable to turf and ground cover growth over areas of the project which are to be seeded, seeded and mulched, or planted, by mixing in an organic material, compost, or commercially available soil amendments. Prepare finish soil layer in areas to be sodded, when called for in the Plans.

162-1.2 Organic Soil Layer: When required by a permit, prepare a 6 inch thick layer of organic soil, at locations shown in the Plans.

162-1.3 Blanket Material: When required by a permit, place a layer of blanket material at the locations and to the depth shown in the Plans.

162-2 Materials.

162-2.1 Finish Soil Layer and Organic Soil Layer: Meet the requirements of Section 987.

162-2.2 Blanket Material: Meet the material classification shown in the Plans and Design Standards, Index No. 505.

162-3 Ownership of Surplus Materials.

The Department will retain ownership of all materials suitable for construction of the prepared soil layer until the final job requirements have been fulfilled. Unless otherwise shown in the Contract Documents, upon final acceptance, Contractor shall take ownership of any surplus materials and dispose of in accordance with 120-5.

Where temporary storage of apparent surplus materials within the right-of-way may be impractical, the materials may be stockpiled outside the right-of-way in areas provided by the Contractor until needed on the project or declared surplus. With the Engineer's written approval, the Contractor may dispose of excess material with the stipulation that any portion required to fulfill job requirements will be replaced with equally suitable material at no cost to the Department.

No extra compensation is allowed for any rehandling involved under the provisions of this Subarticle.

162-4 Construction Methods.

Construct the surface of the earthwork to such lines and elevations that will provide a surface conforming to the plan lines and elevations upon completion of the prepared soil operations. Leave the surface of the earthwork in a roughened and loose condition. Prevent contamination of the materials by other construction operations. Remove and replace all materials which fail to meet the required soil classification or become contaminated after placement, and correct any slippage of this material at no cost to the Department. Spread the appropriate material uniformly over areas to receive treatment.

162-4.1 Finish Soil Layer: After spreading, mix the material with the underlying soil to a combined depth of 6 inches, unless otherwise called for in the Plans. Continue mixing to provide a uniform finish soil layer true to line and grade.

162-4.2 Organic Soil Layer: Spread materials to the depth of 6 inches.

162-4.3 Blanket Material: Place the blanket material to the depth shown in the plans.

162-5 Acceptance Testing.

The Engineer reserves the right to waive or reduce testing requirements for shoulder treatment projects as defined in the Design Standards, Index No. 105.

Immediately after completion of construction operations, sample and test the prepared soil layer at a testing laboratory qualified under 105-6. A LOT is defined as 0.5 shoulder miles. Take random quality control (QC) samples at a minimum of one sample per LOT of prepared

surface. When the source of added material changes, the Engineer will require an additional sample. Average four sequential LOTs representing 2.0 shoulder miles to determine compliance with Section 987. Raise the organic matter content of any individual LOT with an organic matter content below 1.5% to at least 1.5%. The Engineer will take a Verification sample at a minimum frequency of one sample per 4 LOTs. If the Verification sample fails (below 1.5% for organics), but the QC sample taken in the corresponding LOT passes, the Engineer will obtain a resolution sample within the same LOT to resolve the non comparison. The Engineer reserves the right to take and test additional samples to determine specification compliance. For failing samples, take and test additional samples, as directed by the Engineer, to delineate areas that need re-treatment. Perform re-treatment at no additional cost to the Department. Perform additional testing of retreated areas, at locations directed by the Engineer, to determine specification compliance. Submit all test results to the Engineer.

162-5.1 Finish Soil Layer: Test sampled material for organic matter content, pH, primary macronutrients (N, P K) and secondary macronutrients (S, Ca, Mg) content. Acquire from the soil testing laboratory fertilizer recommendations for the specific plants to be grown in the area. Do not seed, seed and mulch, or place sod until acceptable values for organic content and pH are obtained in accordance with the requirements of 987-1.

162-5.2 Organic Soil Layer: Test sampled material for organic matter content in accordance with the requirements of 987-1.

162-5.3 Blanket Material: Test blanket material for depth in accordance with the Plans and for soil classification in accordance with AASHTO M145. Add materials as necessary to achieve the required depth.

162-6 Method of Measurement.

The quantities to be paid for will be the plan quantity for the following items meeting the requirements of this Section, completed and accepted:

1. The area, in square yards, of finish soil layer.
2. The area, in square yards, of organic soil layer.
3. The area, in square yards, of blanket material.

162-7 Basis of Payment.

Prices and payments will be full compensation for completing all work specified in this Section, including furnishing, hauling, and placing materials to the lines and grades shown in the Plans.

Payment will be made under:

Item No. 162- 1- Prepared Soil Layer - per square yard.

**SECTION 285
OPTIONAL BASE COURSE**

285-1 Description.

Construct a base course composed of one of the optional materials shown on the typical cross-sections.

285-2 Materials.

Meet the material requirements as specified in the Section covering the particular type of base to be constructed.

Graded Aggregate	Section 204
Asphalt	Section 234
Limerock	Section 911
Shell Base	Section 911
Shell-Rock	Section 911
Cemented Coquina	Section 911
Recycled Concrete Aggregate (RCA)*	Section 911

*Do not use on interstate roadways.

285-3 Selection of Base Option.

The Plans will include typical cross-sections indicating the various types of base construction (material and thickness) allowable.

Select one base option as allowed for each typical cross-section shown in the Plans. Only one base option is permitted for each typical cross-section.

Notify the Engineer in writing of the base option selected for each typical cross-section at least 45 calendar days prior to beginning placement of base material.

285-4 Construction Requirements.

Construct the base in accordance with the Section covering the particular type of base to be constructed.

Graded Aggregate	Section 204
Asphalt	Section 234
Limerock	Section 200
Shell Base	Section 200
Shell Rock	Section 200
Cemented Coquina	Section 200
Recycled Concrete Aggregate (RCA)*	Section 200

*Do not use on interstate roadways.

285-5 Variation in Earthwork Quantities.

The Plans will identify the optional materials used by the Department for determining the earthwork quantities (Roadway Excavation, Borrow Excavation, Subsoil Excavation, Subsoil Earthwork, or Embankment). The Department will not revise the quantities, for those items having final pay based on plan quantity, to reflect any volumetric change caused by the Contractor's selection of a different optional material.

285-6 Thickness Requirements.

285-6.1 Measurements: For non-asphalt bases, meet the requirements of 200-7.3.1.2.

For subbases, meet the thickness requirements of 290-4.

The Engineer will determine the thickness of asphalt base courses in accordance with 234-8.1.

285-6.2 Correction of Deficient Areas: For non-asphalt bases, correct all areas of the completed base having a deficiency in thickness in excess of 1/2 inch by scarifying and adding additional base material. As an exception, if authorized by the Engineer, such areas may be left in place without correction and with no payment.

For asphalt bases, correct all areas of deficient thickness in accordance with 234-

8.

285-7 Calculation of Average Thickness of Base.

For bases that are not mixed in place, the Engineer will determine the average thickness from the measurements specified in 285-6.1, calculated as follows:

1. When the measured thickness is more than 1/2 inch greater than the design thickness shown on the typical cross-section in the Plans, it will be considered as the design thickness plus 1/2 inch.
2. Average thickness will be calculated per typical cross-section for the entire job as a unit.
3. Any areas of base left in place with no payment will not be included in the calculations.
4. Where it is not possible through borings to distinguish the base materials from the underlying materials, the thickness of the base used in the measurement will be the design thickness.
5. For Superpave asphalt base course, the average spread rate of each course shall be constructed in compliance with 234-8.

285-8 Method of Measurement.

The quantity to be paid for will be the plan quantity area in square yards, omitting any areas where under-thickness is in excess of the allowable tolerance as specified in 285-6. The pay area will be the surface area, determined as provided above, adjusted in accordance with the following formula:

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Plan Thickness

Pay Area = Surface Area (Calculated Average Thickness per 285 -7

The pay area shall not exceed 105% of the surface area.

There will be no adjustment of the pay area on the basis of thickness for base courses constructed utilizing mixed-in-place operations.

For Superpave asphalt base course, the quantity to be paid for will be the plan quantity.

285-9 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including tack coat between base layers, prime coat, cover material for prime coat, bituminous material used in bituminous plant mix, and cement used in soil-cement.

Where the Plans include a typical cross-section which requires the construction of an asphalt base only, price adjustments for bituminous material provided for in 9-2.1.2 will apply to that typical cross-section. For typical cross-sections which permit the use of asphalt or other materials for construction of an optional base, price adjustments for bituminous material provided for in 9-2.1.2 will not apply.

Payment will be made under:

Item No. 285- 7- Optional Base - per square yard.

SECTION 339 MISCELLANEOUS ASPHALT PAVEMENT

339-1 Description.

Construct asphalt pavement in areas where vehicular traffic does not travel, such as pavement under guardrail, bicycle paths, median pavement, sidewalks, etc.

Also, chemically treat the underlying soil to prevent plant growth.

339-2 Materials.

For the pavement, use any plant-mixed hot bituminous mixture meeting the requirements of a mix design verified by the Engineer, except do not use open-graded friction course (FC-5). For bicycle paths, use a mixture that produces a finished pavement which will not distort or mar under bicycle or mower wheel loads.

In general, the Engineer will accept the mixture on the basis of visual inspection with no further testing required.

339-3 Foundation and Soil Treatment.

Shape the soil in areas where pavement is to be constructed, to a surface true to the lines, grades and typical cross-sections shown in the Plans. Compact the soil to a firm state. Immediately before placing the pavement, uniformly apply a pre-emergent herbicide in accordance with the requirements of 7-1.7, to the foundation soil. Ensure that the herbicide carries an approved label for use under paved surfaces, and that herbicide is applied in accordance with directions on the label.

Prevent damage to any adjacent vegetation during herbicide application. Replace, at no expense to the Department, any plants damaged as the result of soil treatment outside designated areas.

339-4 Placing Mixture.

Uniformly place the hot bituminous mixture by machine or hand methods at the rate of spread or dimensions indicated in the Plans or as otherwise directed by the Engineer. If posts are to be constructed within the pavement area, the Contractor may cut holes for installation through the completed pavement. After completing installation of posts and compaction of the backfill material, patch the area around each post with fresh hot bituminous mixture.

If directed by the Engineer, place miscellaneous asphalt pavement prior to placement of the final surface course.

339-5 Compacting Mixture.

Uniformly compact the hot bituminous mixture with lightweight rollers or vibratory compactors as directed by the Engineer. The Contractor may use hand tamps for compaction in areas which are inaccessible to other compaction equipment.

The Engineer will not require a specific density.

339-6 Surface Requirements.

Provide a finished surface that is reasonably smooth, of uniform texture, and shaped so as to drain without ponding of water.

Upon completion of the pavement, shape the surface of the adjacent earth to match the pavement edges.

339-7 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. For each pay item, the pay quantity will be based on the quantity placed on the project, limited to 105% of the adjusted plan quantity for the pay item. The adjusted plan quantity will be determined by dividing the original plan quantity (including any Engineer approved quantity revisions) by the design Gmm stated in 334-1.4, then multiplying it by the tonnage-weighted average Gmm of the mixes used on the project for the pay item. The plan quantity will be determined based on a spread rate of 100 lbs/sy per inch of design thickness of asphalt placed

over the area shown in the Plans.

Prepare a Certification of Quantities, using the Department's current approved form, for the certified miscellaneous asphalt pavement 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 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.

339-8 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including shaping and compacting the foundation, soil sterilization treatment, furnishing of the bituminous material used in the mixture, and shaping of adjacent earth surfaces.

Payment will be made under:

Item No. 339- 1- Miscellaneous Asphalt Pavement - per ton.

**SECTION 350
CEMENT CONCRETE PAVEMENT**

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 welded wire reinforcement, 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.

350-2 Materials.

Meet the following requirements:

Concrete, Class I or Class I (Pavement)	Section 346
Grinding Concrete Pavement	Section 352
Curing Materials	Section 925
Embedded Items.....	Section 931
Joint Seal	Section 932

For concrete pavement placed using the slip-form method of construction, utilize Concrete Class I (Pavement). For concrete pavement placed by hand in constructed forms, utilize Concrete Class I or Concrete Class I (Pavement). LOT size for the use of either material shall be as stated in Section 346 for Concrete Class I (Pavement).

350-3 Equipment.

350-3.1 General: Ensure the equipment and tools that are to be used meet the following:

The capability of handling materials and performing all parts of the work.

To be of such capacity that the paver operates continuously and at a constant rate of production, with starting and stopping held to a minimum.

When equipment operates on the side forms, use scraping devices to clean accumulations from the top of the forms and wheels.

The forms will be a rigid material and mortar tight. Ensure that the alignment and grade of all forms are in accordance with the contract documents, prior to the placing of concrete.

350-3.2 Slip-Form Paver: Provide a slip-form paver that is self-propelled and equipped to spread, strike-off, consolidate, screed, and float-finish the freshly placed concrete in one complete pass of the equipment, in such a manner that a minimum amount of hand-finishing will be necessary to provide a dense and homogeneous pavement. Ensure that the equipment is of such dimensions and arrangement as to cover the full width of the pavement strip being placed. Use equipment that is adjustable as to crown and superelevation and that can shape and compact the concrete into a dense and stable mass, to the required cross-section. Ensure that the crown adjustment is readily controllable for accuracy in crown transitions.

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Operate the paver on tracks having sufficient contact area to prevent track slippage under load. Ensure that the length of ground contact per track and the arrangement of tracks are adequate to meet the straightedge and other riding-quality requirements specified. Accomplish screeding by oscillating screeds, an extrusion device, or a combination of both.

If necessary, in order to produce a pavement of the required cross-section and meeting the surface requirements, equip the slip-form paver with traveling side forms of sufficient dimension and strength and of proper shape to support the concrete laterally for a

sufficient length of time during placing and finishing.

If using trailing forms, provide forms that are rigidly supported laterally.

Equip the slip-form paver with automatic guidance and grade controls which operate by sensing from a taut line set true to line and grade. Erect and maintain the taut line.

Automatic grade controls are not required on the paver when the tracks of the slip-form paver are operating on previously placed concrete pavement. The Engineer may waive the use of automatic grade controls on the paver when the entire width of the tracks of the slipform paver are operating on a subgrade which has been consistently trimmed to a tolerance of 1/8 inch above or below true grade as established by the taut line set for that purpose.

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.

350-3.4 Device for Application of Membrane Curing Compound: Provide equipment for applying membrane curing compound that is self-propelled and capable of uniformly applying the curing compound at the specified rate. Use equipment that continuously stirs the curing compound, by effective mechanical means, and that thoroughly atomizes the curing compound during the spraying operation so that the finished surface of the fresh concrete will not be marred. Cover the entire surface of the pavement and, with slip-form type paving, the vertical faces by a single pass of the machine. Only use spray nozzles that are equipped with appropriate wind guards to ensure uniform application.

Power-spray equipment may be used to apply curing compound to areas where it is impracticable to operate the self-propelled equipment.

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350-3.5 Equipment for Paving Small or Narrow Areas: For variable width areas, other than mainline, ramps, and shoulders, the Engineer will not require the full paving train as specified for the standard run of paving. Use such equipment that is approved by the Engineer.

350-3.6 Hand Finishing Tools: Provide straightedges that have a blade length of 10 feet. Use long-handled floats that have flat blades, approximately 4 feet long by 5 to 8 inches wide, and that are designed so as to remain straight and true. Use a handle for both types of tool with a length that exceeds 1/2 the width of the strip being placed by 3 feet.

350-4 Subgrade Preparation.

Keep construction of the subgrade completed for a distance of at least 500 feet ahead of the paving operation. Maintain the finished subgrade in a smooth, compact condition, and restore any areas which are disturbed prior to placing the concrete. Do not place concrete on a frozen subgrade.

Ensure that the subgrade is within two percent of the optimum moisture content while placing the concrete. Uniformly apply water ahead of the paving operations, as directed by the

Engineer.

Do not allow vehicles to travel on the prepared subgrade between the subgrade trimming machine and the paving operations unless specifically authorized.

Accurately trim the subgrade to the required elevation. Trim high areas to proper elevation. Fill low areas with suitable material, compacted to the specified density, or with concrete placed integrally with the pavement. When slip-form paving, include in the width to be trimmed the areas on which the tracks of the paver will operate.

Remove material planed from the subgrade before placing any concrete. The Engineer may waive the use of the planer for small or isolated areas or any areas where its use would be impracticable.

350-5 Setting Forms.

350-5.1 General: Accurately set the forms to line and grade and such that they rest firmly, throughout their entire length, upon the subgrade surface. Join forms neatly and tightly, and brace them to resist the pressure of the equipment operating on the forms. Obtain the Engineer's approval of the alignment and grade of all forms before and immediately prior to the placing of concrete.

Fill any subgrade that is below the established grade at the form line to grade with granular material, in lifts of 1/2 inch or less, for a distance of 18 inches on each side of the pavement edge, and thoroughly compact the material. As an exception, when placing forms on a cement-treated subgrade, the Contractor may use wedging, provided that the wedging system used adequately supports the forms without causing detrimental deflection under the weight of the paving equipment.

350-5.2 Tamping: When placing forms on other than a cement-treated subgrade, adequately tamp the materials below and adjacent to the forms with form-tamping machines.

350-5.3 Advance Preparation of Forms: Keep sufficient forms on hand at all times, and set forms so that at least 500 feet of forms on each side of the roadway will be accurately set, and maintained true to line and grade, in advance of the point where concrete is being placed. Provide sufficient forms so that it is not necessary to remove them in less than 12 hours after placing the concrete.

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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.

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.

350-7 Placement of Reinforcement.

350-7.1 General: Where the Plans call for reinforced concrete pavement, place the steel reinforcement in the pavement slab in accordance with the details shown in the Plans. At the time of the concrete placement, ensure that the reinforcing steel is free from any of the following which could impair bonding of the steel with the concrete: dirt, oil, paint, grease, mill scale, and any loose or thick rust. Place the reinforcement as provided below.

350-7.2 Welded Wire Reinforcement: 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.

350-7.3 Bars: Place bar reinforcement as shown in the Plans. Securely wire together transverse and longitudinal bars at their intersections. Lap splices not less than 20 times the nominal diameter of the bar, and only in the longitudinal members.

350-8 Placing Concrete.

350-8.1 Distribution: Distribute the concrete on the subgrade to such depth that, when it is consolidated and finished, the slab thickness required by the Plans will be obtained at all points. The surface will at no point be below the grade specified for the finished surface. Place the concrete on the subgrade in a manner which will require as little rehandling as possible. Place concrete as near to expansion and contraction joint assemblies as possible without disturbing them. Ensure that workers do not walk in the freshly placed concrete with their boots or shoes coated with earth or other deleterious substances.

350-8.2 Use of Spreader: Place concrete on the subgrade by an approved spreading device. Do not place concrete from the discharge bucket or hopper onto an assembly without centering the bucket or hopper directly over the assembly.

A spreader is not required in areas where the width of slab varies, intersections, and small or isolated areas where it would be impractical to use a spreader. Perform the necessary hand spreading with shovels (not with rakes or hoes).

350-8.3 Placement Widths: The Contractor may construct the pavement either in lanes as determined by the longitudinal joints shown in the Plans, or for the full width in one operation. Construct the pavement to the full width of the lane or slab in a single construction operation. When constructing pavement in separate lanes, do not deviate the junction line from the true line shown in the Plans by more than 1/2 inch at any point. Tool the edges of the junction to the radius shown in the Plans.

When constructing pavement in separate lanes, place the lanes adjacent to the low edge of the pavement, as shown on the typical section, first.

350-8.4 Consolidation Along Forms and Joints: Thoroughly consolidate concrete against and along the faces of all forms, and along the full length on both sides of all joint
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assemblies, by means of hand-operated, spud-type vibrators. Do not allow vibrators to come in contact with a joint assembly, reinforcement, the subgrade or a side form.

350-8.5 Slip-Form Paver: When placing concrete with a slip-form paver, operate the paver with a continuous forward movement. If for any reason it is necessary to stop the forward movement of the paver, immediately stop operation of the vibrating or tamping elements. Do not apply tractive force to the paving machine except that which is controlled from the machine. In case of an emergency, have available for use at the project site at least 100 feet of forms.

Do not insert steel tie-bars into the unsupported side of the freshly formed slab.

The Contractor may place tie-bars into position prior to extrusion from the paver by insertion through the forms, by insertion through a temporary support form placed against the form slab, or by other means approved by the Engineer. Use a method that results in placement of the tiebars at the specified locations with no damage or disruption of the concrete.

350-9 Striking-off, Consolidating, and Finishing Concrete.

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.

350-9.2 Machine Method: Operate the machine over each area of pavement as few times and at such intervals as is necessary to give proper consolidation and to leave a surface of uniform texture. Avoid excessive operation over a particular area.

Perform strike-off, consolidation, and finishing in a manner such as to avoid damage to, or misalignment of, joint assemblies, reinforcing steel, dowels, and other embedded items. Smooth the surface of the concrete and remove the excess mortar from the surface. Carry a small amount of mortar ahead of the float device as it moves on the surface of the concrete. Operate the machine over the surface of the concrete as many times as required to obtain an acceptable surface, meeting the requirements specified herein. Discard excess mortar beyond the edge of the slab.

350-9.3 Hand Methods:

350-9.3.1 Conditions under which Allowed: Use hand methods in areas of narrow width or irregular dimensions, where operation of mechanical equipment is impracticable.

350-9.3.2 Strike-off and Screeding: Use a portable screed of an approved design, constructed either of metal or of other suitable material shod with metal, to strike-off and screed the concrete. Use a screed that is sufficiently rigid to retain its shape and is at least 2 feet longer than the maximum width of the strip to be screeded.

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350-9.3.3 Consolidation: Use hand-operated spud-type vibrators to consolidate.

350-9.3.4 Floating: Use long-handled floats to float the concrete. Take the necessary care to avoid creating depressions or ridges during this operation.

350-9.4 Work Bridges: Provide work bridges or other devices necessary for access to the pavement surface for the purpose of inspection, finishing, straightedging, and performing corrective work.

350-10 Final Finish.

350-10.1 Finishing: As the water sheen disappears from the surface of the pavement and just before the concrete achieves its initial set, drag a seamless length of damp burlap that extends the full width of the strip of the constructed pavement, longitudinally along the surface to produce a uniform gritty texture.

Use a burlap drag that consists of two layers of medium weight burlap with the trailing edge of the lower layer extending approximately 2 inches behind the upper layer.

Support the burlap drag in a manner so that a length of at least 3 feet of burlap is in contact with the pavement.

Except in areas where using hand methods to construct the pavement, support the lead end of the burlap drag by a traveling bridge. Maintain the drag clean and free from encrusted mortar. Replace the burlap with new material as necessary.

350-10.2 Edging: After applying the final finish, but before the concrete has become nonplastic, carefully round the edges to a 1/4 inch radius on each side of transverse expansion joints and construction joints and along any structure extending into the pavement. Produce a well-defined and continuous radius, and obtain a smooth, dense mortar finish. Completely remove all concrete from the top of the joint filler.

Check all joints with a straightedge before the concrete has become nonplastic, and, if one side of the joint is higher than the other or the entire joint is higher or lower than the adjacent slabs, make corrections as necessary.

350-11 Curing.

350-11.1 General: After completing the finishing operations and as soon as the concrete has hardened sufficiently to not mar the surface, cover and cure the entire surface and, when the slip-form method is used, cover and cure the edges of the newly placed concrete in accordance with one or more of the methods described below. In cases where curing requires the use of

water, ensure that curing has prior right to use all water supplies. If the Contractor fails to provide sufficient curing materials to adequately cure the concrete in place in a timely manner, that portion of the concrete pavement section addressed in the QCP will be suspended. Do not leave the concrete exposed for a period in excess of 30 minutes between stages of curing or during the curing period.

Continuously cure the freshly placed concrete for a period of 72 hours, exclusive of any periods when the temperature of the surface of the concrete falls below 50°F.

350-11.2 White-Pigmented Curing Compound: Under this method, uniformly apply white-pigmented curing compound to the surfaces to be cured, in a single coat, continuous film, at the minimum rate of 1 gallon to every 200 ft², by a mechanical sprayer.

At the time of use, thoroughly mix the compound in accordance with the manufacturer's recommendation.

Do not apply curing compound during periods of rainfall. Do not apply curing compound to the inside faces of joints to be sealed. Should the film become damaged from any
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cause within the required curing period, repair the damaged portions immediately with additional compound. If using side forms, upon their removal, immediately coat the sides of the slabs exposed to provide a curing treatment equal to that provided for the surface.

350-11.3 Burlap Mats: Thoroughly saturate the mats with water before placing them.

Use mats of such dimensions that as laid they extend to at least 2 feet beyond the edges of the strip of concrete placed. Place and weigh down the mats throughout the curing period to ensure contact with the surface being cured. Maintain the mats fully moist and in position for the entire portion of the required curing period.

350-11.4 Removal of Forms: Do not remove forms from freshly placed concrete for at least 12 hours after placement. Remove forms carefully so as to avoid damage to the pavement. After removing the forms, immediately cure the sides of the slab in the same manner as the surface of the pavement.

350-12 Joints.

350-12.1 General: Construct joints at the locations and in accordance with the details shown in the Design Standards, Index Nos. 305 and 306 and the Contract Documents.

350-12.2 Longitudinal Joints:

350-12.2.1 Longitudinal Construction Joints: Where the pavement is poured in strips less than the full width of the pavement, construct longitudinal construction joints in accordance with the details shown in the Plans.

350-12.2.2 Longitudinal Lane-tie Joints: Construct longitudinal lane-tie joints within the limits of a strip of pavement, in accordance with the details shown in the Plans.

Construct the plane of weakness by sawing a groove in the hardened concrete. Complete sawing as soon as possible but in no case longer than 72 hours after placing the concrete.

350-12.2.3 Tie Bars and Bolt Assemblies: Place deformed steel tie bars or tie bolt assemblies at the required depth, parallel to the finished surface, at right angles to the joint and at the uniform spacing specified or required in the Plans. Place them in the plastic concrete using approved equipment, or rigidly support them on the subgrade by approved devices capable of preventing displacement prior to placing of the concrete. Do not paint or coat the bars with any material before placing them in the concrete.

If placing tie bars along a longitudinal construction joint using the method of inserting bars with a 90 degree bend in the edge of the plastic concrete and after the concrete hardens straightening these bars, use Grade 40 reinforcing steel for such tie bars. Replace any bar broken while being straightened in an approved manner.

350-12.3 Transverse Joints:

350-12.3.1 Transverse Construction Joints: Construct transverse construction joints at the end of all pours and at other locations where the paving operations are stopped for as

long as 30 minutes. Do not place construction joints, however, within 10 feet of any other transverse joint or within 10 feet of either end of a section of pavement. If sufficient concrete has not been placed to form a slab at least 10 feet long, remove the excess concrete, back to the last preceding joint. Form the joints by placing a wood or metal bulkhead accurately and securely in place, in a plane perpendicular to the profile and centerline of the pavement. Install dowel bars at the construction joints. Saw or form construction joints, in a manner similar to contraction joints, so that a groove will be formed for holding the joint sealing compound.

350-12.3.2 Transverse Contraction Joints: Construct transverse contraction joints at the interval indicated in the Plans consisting of planes of weakness created by sawing a 347

groove in the surface of the hardened concrete. Place the groove perpendicular to the surface of the pavement. Install load transfer devices in transverse contraction joints.

Ensure that the sawing equipment does not damage the pavement, and saw the transverse contraction joints as soon as the pavement has hardened to the degree that tearing and raveling are not excessive and before uncontrolled shrinkage cracking begins.

Accomplish the joint sawing in two steps. Make the initial cut 1/8 inch wide by a depth at least 1/3 of the pavement thickness and as soon as possible but in no case longer than 12 hours after placing the concrete. Make a second saw cut, to provide the joint dimensions indicated in the Plans, just prior to sealing the load transfer device.

In cases where a strip of pavement is being placed immediately adjacent to a previously constructed strip of pavement, construct transverse contraction joints using extreme care to time sawing so as to prevent uncontrolled cracks.

Repair any uncontrolled cracks at no expense to the Department by removing and replacing the pavement across the full width of all affected lanes or shoulders and to the nearest transverse joint in each direction.

After the final sawing, clean the joint, install the bond breaker, and seal the joint.

350-12.3.3 Transverse Expansion Joints: Form transverse expansion joints using preformed joint filler, and provide them with dowel load transfer, in accordance with the details shown on the Design Standards, or in the Plans.

Form the joints during the placing of the concrete, by securely staking a metal bulkhead accurately in place at the joint location or by other methods which will securely brace and support the joint filler. Where using approved devices to keep the expansion joint filler and dowels securely in place, the Engineer will not require a bulkhead. Protect all transverse expansion joints at the bottom and side edges by a sheet metal strip as specified in 931-2.1 and as shown in the Contract Documents.

Cut the filler to the crown and shape of the slab cross-section and extended it to the subgrade. After installation, ensure that the top is not less than 1 inch, and not more than 1.25 inches, below the finished surface. Furnish the joint filler in lengths not less than the lane widths being poured, except that the Engineer will not require lengths greater than 12 feet. Where more than one section is allowed and used in a joint, securely lace or clip the sections together.

Place the filler normal to the pavement surface. Stake the assembly into position in such a way as to hold the assembly securely in position throughout construction. Ensure that the assembly is true to the line prescribed, subject to a tolerance of 1/4 inch in the width of the slab. Obtain the Engineer's approval of the assembly and its installation before placing any concrete against it. Obtain the Engineer's approval of the cross-section and length of the stakes.

When laying the pavement in partial width slabs, place transverse joints in the succeeding slab in line with the like joints in the first slab. In the case of widening existing pavement, place transverse joints in line with like joints in the existing pavement or as otherwise

shown in the Plans.

350-12.4 Load-Transfer Devices: Provide dowel load-transfer devices in all transverse joints. Firmly hold dowel bars in a position parallel to the surface and the centerline of the slab, by approved steel supports and spacers of a type shown in the Plans. The Engineer may approve the use of dowel bar supports or assemblies other than those specifically detailed in the Plans.

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Allow the dowels to be free to move in one slab as the concrete contracts and expands. Paint each dowel with one coat of zinc rich primer or red oxide alkyd based primer meeting the requirements of SSPC Paint 25 Type I or Type II. Wait a minimum of 7 days before coating onehalf of the dowel with a petroleum based lubricant grease to inhibit bonding to the concrete.

Provide a cap for the free end of expansion joint dowels.

Position each dowel such that its final deviation from parallel to the surface of the pavement and parallel to the longitudinal centerline of the pavement does not exceed 1/2 inch.

Position each dowel such that its final deviation from being centered on the joint does not exceed 2 inches. Position each dowel such that at no point in its length does it deviate from the surface of the pavement as shown in the Plans in excess of 1 inch. Confirm the position of dowel bars by suitable means acceptable to the Engineer, which may include non-destructive testing methods.

350-12.5 Expansion Joints Around Structures:

350-12.5.1 Expansion Joints at Manholes, Meter Boxes and other

Projections: Form expansion joints by placing premolded expansion joint material about all structures and features projecting through, into or against the pavement. Ensure that such joints are 1/2 inch in width.

350-12.5.2 Bridge Approach Expansion Joints: Construct in accordance with Design Standards, Index No. 306.

350-12.6 Cleaning Joints and Cracks:

350-12.6.1 Cleaning Joints in New Pavement:

350-12.6.1.1 Sawed Joints: Immediately after sawing the joints which require sealing, completely remove the resulting slurry from the joint and the immediate area by flushing with a jet of water under pressure and by using other tools as necessary.

After flushing, blow out the joints with compressed air. After the flushed joints have dried, sandblast the joint faces to thoroughly remove all foreign material.

Perform sandblasting in two passes, once for each face.

Patch all spalled edges with an epoxy compound.

Immediately prior to joint seal installation, clean the joints using compressed air to remove all traces of debris and dust within and on the joint surfaces.

350-12.6.1.2 Non-Sawed Joints: Thoroughly clean joints which require sealing of all foreign material for the full depth of the seal installation.

With the exception of slurry removal due to sawing, meet the cleaning requirements as specified for sawed joints.

350-12.6.2 Cleaning Joints in Existing Pavement: Remove all existing jointsealing material and foreign material for the full depth of the new joint seal by sawing, wire brushing, sandblasting, or other methods approved by the Engineer.

Remove any existing sealant or parting strip material below the tape or backer rod bond breaker and replace it with additional bond breaker. When conditions require removal and replacement with additional bond breaker below the new joint seal, obtain the Engineer's approval of the type of bond breaker and its installation procedure. Perform cleaning by any method or combination of methods, as detailed in the Plans.

Flush the joint with a pressurized jet of water, and use other tools as necessary, to remove loose remnants and debris.

After flushing, blow out the joints with compressed air. After the flushed joints have dried, sandblast the joint faces to thoroughly remove all foreign material. Perform

sandblasting in two passes, once for each face.

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Patch all spalled edges with an epoxy compound.

Immediately prior to joint seal installation, clean the joints using compressed air to remove all traces of debris and dust within and on the joint surfaces.

350-12.6.3 Cleaning Random Cracks in Existing Pavement: Do not begin cleaning random cracks in existing pavement until all other concrete pavement repairs have progressed to the point where those operations will not adversely affect the installation of the new seal.

Cut the random cracks to be repaired and sealed into grooved joints to the depth and width detailed in the Plans. Clean the joints as specified in 350-12.6.2.

350-12.7 Sealing Joints and Cracks: Seal joints in new pavement before allowing any traffic or construction equipment on the pavement. Complete sealing within 72 hours (weather permitting) of sawing. If traffic is going to be on the pavement prior to any grinding, then seal the joints with a temporary material acceptable to the Engineer.

When using silicone and non-silicone sealants in the transverse and longitudinal joints, respectively, always use the silicone sealants first to prevent contamination at the intersection of the joint faces. Remove non-silicone sealant 1 foot in each direction from the transverse joints, and replace it with silicone sealant.

Use equipment equipped with nozzles that discharge the sealant at the bottom of the groove. Ensure that the apparatus develops sufficient pressure to extrude the joint sealer from the nozzles satisfactorily and to control the rate of application so as to completely fill the joint to within 1/4 inch of the surface of the pavement without spillage. Use an apparatus so constructed that it maintains the proper temperature of the sealing material within the manufacturer's recommendation.

350-12.7.1 Hot-Poured Type Sealant: When the Plans require hot poured sealant for specific joints, fill the joint thoroughly, without trapping air, ensuring the sealant is recessed below the pavement surface as required, and control the pouring rate to avoid spilling of sealant onto the adjacent pavement surface. If any spilling of sealant occurs, immediately remove and clean the entire surplus amount from the pavement surface. Place poured material when the ambient air temperature is 50°F or greater.

Use an indirect heating or double boiler type heating kettle that uses oil as a heat transfer medium, for hot poured sealer. Use a heating kettle that has a thermostatically controlled heat source, a built-in automatic agitator, and thermometers installed to indicate both the temperature of the melted sealing material and that of the oil bath.

350-12.7.2 Low Modulus Silicone Sealant: Use low modulus silicone sealant of either Type A (non-self-leveling silicone sealant), or Type B and/or Type C (self-leveling silicone sealant). Because Type A will not flow into the proper shape under its own weight, install and tool it so that the sealant is in firm contact with the joint faces and is formed into the appropriate shape as specified. Types B and C will normally flow into the proper shape without tooling. Exercise care to provide the required depth of recess above the sealant surface and below the pavement surface. Install the silicone sealant at temperatures above 40°F.

350-13 Surface Requirements.

Produce, by grinding in accordance with Section 352, a pavement surface that is true to grade and uniform in appearance with a longitudinal line type texture.

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350-14 Thickness Determinations.

350-14.1 General: After completing the concrete pavement, including any corrective work to meet ride requirement, determine the thickness by one of following methods. The Engineer will select the locations for testing and make the determination of thickness. Sample locations will be taken at various points on the cross-section so that each test represents an area

not exceeding 2,500 yd². Provide traffic control, non-destructive equipment, coring equipment, and operator to obtain the samples.

350-14.1.1 Core Borings: To determine the actual thickness, drill cores from the pavement and measure thickness in accordance with ASTM C174. Replace the portions of the pavement removed by the borings at no expense to the Department.

350-14.1.2 Non-destructive Testing: For a determination using the impact-echo method, measure the thickness of the pavement in accordance with ASTM C1383. The initial thickness measurement will be validated by having a core boring taken at that location in compliance with 350-14.1.1. If the results from the impact-echo test vary by plus or minus 0.15 inches from the core boring, then the non-destructive test method cannot be used on the pavement. In such case, the core boring will be used for acceptance of that LOT of concrete. The Engineer has the option to verify the accuracy of the results at any time.

350-14.2 Method of Calculating Average Thickness: The Department will determine the average thickness of the pavement by using the following method of calculation:

1. The Department will not take into account in the calculation, any areas of pavement which are left in place, but for which no payment will be made.
2. When the thickness of the pavement is more than 1/2 inch greater than the specified thickness, the Department will consider it in the calculation as the specified thickness plus 1/2 inch.
3. The Department will calculate the average thickness for the entire job as a unit.

350-15 Deficient Thickness.

350-15.1 General: The Department will not pay for any pavement which is more than 1/2 inch less than the specified thickness. When the pavement contains no longitudinal construction joint, the Department will not pay for the area of such pavement that is the product of the full width of the strip placed as a unit times the sum of the distances each way from the short core or cores to the cores on each side which show measurements within the tolerance limits. When the pavement contains longitudinal construction joints, for the width, the Department will use the width between longitudinal construction joint and the edge of pavement.

350-15.2 Deficient Pavement Requiring Removal: The Engineer will evaluate areas of pavement found deficient in thickness by more than 1/2 inch and if, in his judgment, the deficiency is enough to seriously impair the anticipated service life of the pavement, remove such areas and replace them with concrete of the thickness shown in the Plans. The Department will not pay for the area of pavement removed or for the materials or labor involved in its removal. When removing a section of pavement, remove the full length between transverse joints.

350-15.3 Deficient Pavement Left in Place: If the Engineer determines that the deficiency will not seriously impair the anticipated service life of the pavement, the pavement may be left in place, at no compensation.

350-15.4 Additional Borings: If the number of cores taken is not sufficient to indicate the thickness of the pavement, additional boring locations may be requested, with prior approval from the Engineer at no additional cost to the Department.

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350-16 Opening Pavement to Traffic.

Construct an earth berm along each edge of the pavement within 36 hours of finishing any newly placed concrete pavement. Build the berm to the full height of the pavement and at least 18 inches wide, and sufficiently compacted to prevent underwash of the pavement. Maintain the berm until the final shoulders are complete.

Except as provided below, keep the pavement closed to traffic for a minimum period of 14 calendar days after placement of the concrete. The Engineer may permit opening of a section of pavement to traffic at an earlier time provided that representative test cylinders, made in accordance with ASTM C31 and tested in accordance with ASTM C39, indicate a compressive

strength of at least 2200 psi. Cure these test cylinders in a manner identical to the corresponding section of pavement.

Protect the pavement from all traffic, including construction operations, until the specified period of time has elapsed. Protect the pavement from ambient temperatures below 50°F for the calendar days or until the required compressive strength has been attained.

350-17 Method of Measurement.

350-17.1 Concrete Pavement: The quantities to be paid for will be the plan quantity, in square yards, of plain cement concrete pavement and of reinforced cement concrete pavement, omitting any areas not allowed for payment under the provisions of 350-15.3 and adjusted for average thickness as provided herein.

For purposes of payment, the average thickness of pavement will determine the final pay quantities for this pavement as follows:

The area of pavement represented by the difference between the calculated average thickness and the specified thickness will be converted into equivalent square yards of specified thickness pavement, and the quantity thereby obtained will be added to, or deducted from, the quantity of pavement to be paid for, subject to the limitation that the maximum average of over-thickness permitted in the adjustment of the quantity of pavement to be paid for will be 1/4 inch.

Where the Plans call for cement concrete pavement that is to be covered with asphalt concrete surface course, payment will be made for the total thickness of the combination as plain cement concrete pavement. In such cases, price and payment will also include all costs of the asphalt concrete surface course constructed in accordance with Section 334.

Reinforcing steel, placed and accepted, will be measured and paid for as provided in Section 415.

350-17.2 Joints and Cracks: For cleaning and sealing joints in new or existing concrete pavement, the quantity to be paid will be the length in feet, as determined by field measurement along the joints.

For cleaning and sealing random cracks in existing concrete pavement, the quantity to be paid will be the length in feet, as determined by field measurement along the cracks.

350-17.3 Bridge Approach Expansion Joint: The quantity to be paid for will be plan quantity, in feet of bridge approach expansion joint installed in accordance with Design Standards, Index No. 306, calculated across the pavement at right angles to the centerline of the roadway pavement, completed and accepted.

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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- 3- Plain Cement Concrete Pavement - per square yard.

Item No. 350- 4- Reinforced Cement Concrete Pavement - per square yard.

Item No. 350- 5- Cleaning and Sealing Joints - per foot.

Item No. 350- 6- Cleaning and Sealing Random Cracks - per foot.

**SECTION 400
CONCRETE STRUCTURES**

400-1 Description.

Construct concrete structures and other concrete members, with the exception of pavement and incidental concrete construction (which are specified in other Sections). Refer to Section 450 for prestressed construction requirements additional to the requirements of this Section.

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

Obtain incidental precast products from a plant that is currently on the Department's Production Facility Listing. Producers seeking inclusion on the list shall meet the requirements of Section 105.

400-2 Materials.

Meet the following requirements:

Concrete	Sections 346 and 347
Penetrant Sealer	Section 413
High Molecular Weight Methacrylate (HMWM)**	Section 413
Reinforcing for Concrete	Section 415
Water	Section 923
Curing Materials*	Section 925
Epoxy Bonding Compounds**	Sections 926 and 937
Joint Materials**	Section 932
Bearing Pads	Section 932
Non-Shrink Grout**	Section 934
Class 5 Applied Finish Coatings**	Section 975
Galvanizing Compound**	Section 562
Dowel Bar Assembly**	Section 931
Filter Fabric	Section 985

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

**Use products listed on the Department's Approved Product List (APL).

400-3 Depth of Footing.

Refer to Section 455, "D. SPREAD FOOTINGS".

400-4 Falsework.

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

400-4.2 Design and Erection: Design and construct all falsework to provide the necessary rigidity and to support the loads without appreciable settlement or deformation. Use 370

screw jacks or hardwood wedges to take up any settlement in the framework, either before or during the placing of concrete. If any weakness develops and the centering shows undue settlement or distortion, stop the work, remove any masonry affected, and strengthen the falsework before resuming work. Support falsework which cannot be founded on a satisfactory footing on piling. Space, drive, and remove the piling in an approved manner.

400-4.3 Camber: Provide camber to correct for settlement and deflection of falsework.

Give bridges permanent camber only when shown in the Plans.

400-4.4 Bridge Deck Overhang Falsework for Steel I-Girders: Locate the lower contact point of bridge deck overhang falsework supporting screed rails within 6 inches above the bottom flange. If the lower contact point of the overhang falsework bears more than 6 inches

above the bottom flange and/or if the deck overhang is 4 feet or greater, submit shop drawings and calculations to the Engineer in accordance with Section 5 and Chapter 11 of the Structures Design Guidelines (SDG). The deck overhang is measured from the centerline of the girder supporting the overhang falsework to the outside edge of the concrete deck.

400-5 Forms.

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

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

400-5.3 Non-metallic Form Materials:

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

400-5.3.2 Form Liners: Use form liners of durable, abrasion resistant materials that are unaffected by water. Use liners with a hard surface texture capable of rendering concrete surfaces of a smooth, uniform texture, without grain marks, patterns, or blemishes. Use form liner material of sufficient thickness to eliminate the reflection of irregularities, undesirable patterns, and marks from the forms to the surfaces. Replace liners as necessary to produce a consistent concrete surface texture. Use form liners in large sheets and with true, tight-fitted joints which are logically located. Obtain the Engineer's approval of the layout of sheets. Do not use liners which have been patched. Use liner material of the same stock throughout.

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

400-5.4 Special Requirements:

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

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

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

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

1. Use this procedure only in locations not exposed to view from traveled roadways.
2. Obtain required elevations shown in the Plans.
3. Obtain neat line dimensions shown in the Plans.
4. Fill the entire excavation with concrete to the required elevation of the top of the footing.
5. The Engineer will determine the volume of footing concrete to be paid for from the neat line dimensions shown in the Plans.

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

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

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

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

1. Treat all forms with an approved form-release agent before placing concrete. Do not use material which adheres to or discolors the concrete.
2. Clean forms of all concrete laitance from previous use and all dirt, sawdust, shavings, loose wire ties and other debris.
3. Close and secure all inspection and cleanout holes.

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400-5.7 Stay-In-Place Metal Forms:

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 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*

Noncellular

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

Noncellular

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 steel reinforcing or fiber reinforced polymer (FRP) reinforcing 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 in 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

374 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.

400-5.7.2 Design: Meet the following criteria for the design of stay-in-place bridge deck forms:

1. The maximum self weight of the stay in place metal forms, plus the weight of the concrete or expanded polystyrene required to fill the form flutes (where used), shall not exceed 20 psf.
2. Design the forms on the basis of dead load of form, reinforcement, and plastic concrete plus 50 pounds per square foot for construction loads. Use a unit working stress in the steel sheet of not more than 0.725 of the specified minimum yield strength of the material furnished, but not to exceed 36,000 psi.
3. Do not allow deflection under the weight of the forms, reinforcement, and plastic concrete to exceed 1/180 of the form span or 1/2 inch, whichever is less, for form spans of 10 feet or less, or 1/240 of the form span or 3/4 inch, whichever is less, for form spans greater than 10 feet. In all cases, do not use a total loading (psf) that is less than 20 plus the product of the deck thickness measured in inches times 12.5.
4. Use a design span of the form equal to the clear span of the form plus 2 inches. Measure the span parallel to the form flutes.
5. Compute physical design properties in accordance with requirements of the AISI Specifications for the Design of Cold Formed Steel Structural Members, latest published edition.
6. For all reinforcement, maintain the design concrete cover required by the Plans.
7. Maintain the plan dimensions of both layers of primary deck reinforcement from the top surface of the concrete deck.
8. Do not consider the permanent bridge deck form as lateral bracing for compression flanges of supporting structural members.
9. Do not use permanent steel bridge deck forms in panels where longitudinal deck construction joints are located between stringers.
10. Secure forms to the supporting members by means other than welding directly to the member.

400-5.7.3 Materials:

400-5.7.3.1 Metal Forms: Fabricate stay-in-place metal forms and supports from steel meeting the requirements of ASTM A653 having a coating designation G165. Do not use form materials that are less than 0.03 inch uncoated thickness.

400-5.7.3.2 Polymer Sheeting: Use polymer sheeting comprised of at least 85% ethylene acrylic acid copolymer capable of being applied to both G165 and G210 steel 375

sheet as described in ASTM A742. Ensure that the polymer sheeting has a nominal thickness of 12 mils as manufactured and a minimum thickness of 10 mils after lamination to the steel sheet. Ensure that the polymer sheeting remains free of holes, tears and discontinuities and sufficiently flexible to withstand the forming process without any detrimental effects to bond, durability or performance. Ensure that the polymer sheeting is UV stabilized and contains antioxidants. Ensure that the as-manufactured polymer sheeting (prior to application) has an Oxidative Induction Time (OIT) of 60 to 75 minutes at 170°C in air when tested according to ASTM D3895. Perform additional OIT tests on samples taken from the

finished product (polymer sheeting applied to forms) resulting in a minimum OIT according to ASTM D3895 of 32 minutes at 170°C in air. Ensure that the polymer sheeting adheres to galvanized metal sufficient to prevent undercutting at penetrations made through the polymer sheeting or metal forms to the satisfaction of the Engineer. Ensure that edges subjected to shear cutting are coated by the form manufacturer with two coats of a compatible liquid coating repair material before delivery to the site. Ensure that steel used to produce polymer laminated metal forms is appropriately cleaned and prepared per NCCA (National Coil Coating Association) standard continuous coil coating practices. Ensure that pretreatment for use in conjunction with the manufacturer's polymer sheeting material is approved as compatible by the polymer sheeting manufacturer. Apply pretreatment in accordance with the polymer sheeting manufacturer's procedures. Apply polymer sheeting in accordance with the manufacturer's recommendations and procedures. Ensure that all steel has the polymer sheeting applied prior to fabrication of the stay-in-place forms and accessories.

Ensure that the screws to be used in the fastening of the stay-in-place laminated metal forms have a corrosion resistant cladding that will not have an adverse effect to the system due to the contact of dissimilar metals.

400-5.7.3.3 Certification: Submit a written certification from the manufacturer stating the product meets the requirements of this specification along with the delivery of the coated forms to the jobsite. Ensure that the certification conforms to the requirements of Section 6. Ensure that the manufacturer has a quality control program conforming to ISO 9001 2000 standards.

400-5.7.3.4 Polystyrene Foam: Use polystyrene foam comprised of expanded polystyrene manufactured from virgin resin of sufficient density to support the weight of concrete without deformation. Extrude the polystyrene foam to match the geometry of the flutes and provide a snug fit. Use polystyrene foam that has a density of not less than 0.8 pounds per cubic foot. Use polystyrene foam that has water absorption of less than 2.6% when tested according to ASTM C272. Submit a written certification from the manufacturer stating the product meets the requirements of this Specification along with the delivery of the product.

400-5.7.4 Construction: Install all forms in accordance with approved fabrication and erection plans.

Do not rest form sheets directly on the top of the stringer of floor beam flanges. Fasten sheets securely to form supports, and maintain a minimum bearing length of 1 inch at each end for metal forms. Place form supports in direct contact with the flange of the stringer or floor beam. Make all attachments for coated metal forms by bolts, clips, screws, or other approved means.

400-5.7.4.1 Form Galvanizing Repairs: For any permanent exposed steel where the galvanized coating has been damaged, thoroughly clean, wire brush, and paint it with 376

two coats of galvanizing compound in accordance with Section 562 to the satisfaction of the Engineer. Do not touch up minor heat discoloration in areas of welds.

400-5.7.4.2 Polymer Sheeting Repairs: Inspect and identify areas for damage to the polymer sheeting and repair with liquid polymer coating similar and compatible with respect to durability, adhesion and appearance in accordance with ASTM A762, as furnished by the stay-in-place form manufacturer. Ensure that the inspection includes checking the polymer sheeting for cuts, tears, cracking, surface pits, peeling, dirt, grease, oil, stains, rust or bare areas. Reject any panels that show coating blistering, peeling or cracking. Repair all polymer sheeting damage according to the following:

1. **Surface Preparation:** Ensure that all surfaces to be repaired are clean and free of any deleterious substances. Remove all traces of dirt, soil, oil deposits, greases, and other surface contaminants in accordance with the polymer sheeting and coating manufacturer's written specifications prior to touch-up and recoating.

2. Application Procedures: Ensure that the liquid polymer repair coating is applied to a clean dry surface and in accordance with the manufacturer's written specifications. Apply the repair coating using a suitable paintbrush or other means acceptable to the Engineer. Apply a first coat of product to the surface at 2-4 mils in thickness. Let the first coat air dry. Apply a second coat to form a complete layer and increase the thickness, immediately after verifying the first coat is dry to the touch (15 - 25 minutes depending on the local air drying temperature and atmospheric conditions). Apply the second coat at the same coating thickness as the first at 2-4 mils. Ensure that the total dry film thickness of the two coats is not less than 6 mils. Apply additional coats in this same manner until desired coating thickness is achieved.

400-5.7.5 Placing of Concrete: Vibrate concrete to avoid honeycomb and voids, especially at construction joints, expansion joints, valleys and ends of form sheets. Use approved pouring sequences. Do not use calcium chloride or any other admixture containing chloride salts in the concrete.

400-5.7.6 Inspection: The Engineer will observe the Contractor's method of construction during all phases of the construction of the bridge deck slab, including the installation of the metal form system; location and fastening of the reinforcement; composition of concrete items; mixing procedures, concrete placement, and vibration; and finishing of the bridge deck. Should the Engineer determine that the procedures used during the placement of the concrete warrant inspection of the underside of the deck, remove at least one section of the metal forms in each span for this purpose. Do this as soon after placing the concrete as practicable in order to provide visual evidence that the concrete mix and the procedures are obtaining the desired results. Remove an additional section in any span if the Engineer determines that there has been any change in the concrete mix or in the procedures warranting additional inspection. If, in the Engineer's judgment, inspection is needed to check for defects in the bottom of the deck or to verify soundness, sound the metal forms with a hammer as directed by the Engineer after the deck concrete has been in place a minimum of two days. If sounding discloses areas of doubtful soundness to the Engineer, remove the metal forms from such areas for visual inspection after the concrete has attained adequate strength. Remove metal bridge deck forms at no expense to the Department.

At locations where sections of the metal forms have been removed, the Engineer will not require the Contractor to replace the metal forms. Repair the adjacent metal forms and supports to present a neat appearance and to ensure their satisfactory retention and

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where they are polymer sheeted, coat all exposed surfaces of stay-in-place metal form system elements that are not coated or are damaged with a field applied liquid polymer coating as specified in 400-5.7.4.2. As soon as the form is removed, the Engineer will examine the concrete surfaces for cavities, honeycombing, and other defects. If irregularities are found, and the Engineer determines that these irregularities do not justify rejection of the work, repair the concrete as directed, and provide a General Surface Finish in accordance with 400-15. If the Engineer determines that the concrete where the form is removed is unsatisfactory, remove additional metal forms as necessary to inspect and repair the slab, and modify the method of construction as required to obtain satisfactory concrete in the slab. Remove and replace all unsatisfactory concrete as directed, at no expense to the Department.

If the method of construction and the results of the inspections as outlined above indicate that sound concrete has been obtained throughout the slabs, the amount of sounding and form removal may be reduced when approved by the Engineer.

Corrosion of assembly screws will not be considered a structural or aesthetic problem and is considered acceptable.

Provide the facilities for the safe and convenient conduct of the inspection procedures.

400-5.8 Stay-In-Place Concrete Forms:

400-5.8.1 General: Permanent stay-in-place precast reinforced concrete forms may be used in lieu of removable forms to form concrete bridge deck slabs subject to the conditions contained herein. Precast reinforced concrete stay-in-place forms are not permitted to construct a composite concrete deck. Do not use precast prestressed concrete stay-in-place forms to form any permanent bridge decks.

When detailed Plans for structures are dimensioned for the use of removable forms, provide additional slab thickness, elevation changes, changes in design, etc. to accommodate the use of stay-in-place forms, subject to the Engineer's approval. The Engineer will compute pay quantities of the various component members of the structure which are paid on a cubic yard basis from the design dimensions shown in the Plans with no allowance for changes in deflection and changes in dimensions necessary to accommodate the stay-in-place forms. The Engineer will limit pay quantities of other Contract items which are increased to accommodate the use of stay-in-place forms to the quantity required for the original plan design. Prior to using stay-in-place forms, submit for approval detailed plans of the forming system and design calculations. Indicate on the plans the form panel sizes, placing patterns, type of mastic or felt bearing material and type and method of caulking between panels. Also, submit appropriate changes in design details of structural members supporting stay-in-place forms showing any revisions necessary to enable the supporting components to withstand the additional weight of the forms and perform equally as contemplated in the Plans. All calculations and details submitted shall be sealed by the Contractor's Engineer of Record. Modify the beams to provide additional strength to compensate for the added dead loads imposed by the use of stay-in-place forms. Obtain this strength by adding additional strands to prestressed girders or increasing the section modulus for steel girders. Do not use stay-in-place forms until the forming system and any necessary design revisions of supporting structural members have been approved by the Engineer. The Department is not responsible for the performance of the stay-in-place forms by its approval.

400-5.8.2 Materials: Construct permanent concrete forms of precast reinforced concrete with a Class 3 Surface Finish. As a minimum, use the same class of concrete and 378

28-day minimum compressive strength as being used to construct the bridge deck. Use welded steel wire reinforcement meeting the requirements of Section 931.

400-5.8.3 Design: Use the following criteria for the design of permanent bridge deck forms:

1. Design the forms on the basis of deadload of form, reinforcement, and plastic concrete plus an unfactored live load of 50 psf for construction loads. Meet the AASHTO design requirements for service loads and ultimate loads as applicable.
2. Deflection under the weight of the forms, reinforcement, and the plastic concrete shall not exceed $1/180$ of the form span or $1/2$ inch, whichever is less. In all cases, do not use a loading that is less than 120 psf total.
3. Use a design span of the form equal to the clear span of the form between supports. Measure the span of concrete forms parallel to the centerline of the form panels.
4. Compute physical design properties of concrete forms in accordance with current AASHTO design procedures.
5. Ensure that all reinforcement contained in the cast-in-place concrete has the minimum cover shown in the Plans or not less than one inch, whichever is greater. Measure the minimum cover normal to the plane of the bottom of the cast-in-place concrete. For stay-in-place concrete forms with other than plane surfaces in contact with the cast-in-place concrete, such as regularly spaced geometrical shapes projecting above the plane of the bottom of the cast-in-place concrete, meet the following special requirements:

- a. Space geometrical shapes projecting above the bottom plane of the cast-in-place concrete used to provide support for reinforcement no closer than 3 feet apart and of sufficient height to maintain the required concrete cover on the bottom mat of reinforcing bars.
 - b. Construct all other geometrical shapes projecting above the plane of the bottom of the cast-in-place concrete to provide a minimum vertical clearance of 3/4 inch between the closest surface of the projections and the secondary longitudinal reinforcing bars in the deck slab.
 - c. Do not allow a minimum horizontal distance from the surface of any transverse reinforcing bars to surfaces of the stay-in-place form of less than 1 1/2 inches. For all reinforcement for the stay-in-place form panels, provide a minimum of 1 inch concrete cover except that, for construction in a salt or other corrosive environment, provide a minimum of 1 1/2 inches concrete cover.
6. Maintain the plan dimensions of both layers of primary deck reinforcement from the top surface of the concrete deck. Measure the minimum cover of the bottom mat of reinforcement normal to the top of the precast concrete form panel.
7. Do not consider the permanent bridge deck form as lateral bracing for compression flanges of supporting structural members.
8. Do not use permanent concrete bridge deck forms in panels where longitudinal deck construction joints are located between stringers.
9. Do not allow the maximum weight of the concrete form to exceed 40 pounds per square foot of form surface.
- 400-5.8.4 Construction: Install all forms in accordance with approved fabrication and erection plans.

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For concrete forms, provide a minimum bearing length of at least 1 1/2 inches but not exceeding 2 1/2 inches. Support concrete forms on the beams or girders by continuous layers of an approved mastic or felt bearing material that will provide a mortar tight uniform bearing. Use a mastic or felt bearing material that has a minimum width of 1 inch and a maximum width of 1 1/2 inches. Seal joints between concrete form panels with caulking, tape, or other approved method.

400-5.8.5 Placing of Concrete: Place the concrete in accordance with the requirements of 400-5.7.5. Immediately prior to placing the slab concrete, saturate concrete stay-in-place form panels with water.

400-5.8.6 Inspection: Inspect the concrete in accordance with the requirements of 400-5.7.6.

After the deck concrete has been in place for a minimum period of two days, inspect the forms for cracks and excessive form deflection, and test for soundness and bonding of the forms by sounding with a hammer as directed by the Engineer. Remove, for visual inspection, form panels found to be cracked that show evidence of leakage and form panels which have a deflection greater than adjacent panels by 1/2 inch or more which show signs of leakage. If sounding discloses areas of doubtful soundness to the Engineer, remove the form panels from such areas for visual inspection after the concrete has attained adequate strength. Remove permanent bridge deck form panels at no expense to the Department. At locations where sections of the forms have been removed, the Engineer will not require the forms to be replaced. Repair the adjacent forms and supports to present a neat appearance and to ensure their satisfactory retention. As soon as the form is removed, the Engineer will examine the concrete surfaces for cavities, honeycombing, and other defects. If irregularities are found, and the Engineer determines that these irregularities do not justify rejection of the work, repair the concrete as directed and provide a General Surface Finish in accordance with 400-15. If the concrete where the form is removed is unsatisfactory, as

determined by the Engineer, additional forms shall be removed as necessary to inspect and repair the slab, and modify the methods of construction as required to obtain satisfactory concrete in the slab. Remove and replace all unsatisfactory concrete as directed at no expense to the Department.

If the methods of construction and the results of the inspections as outlined above indicate that the Contractor has obtained sound concrete throughout the slabs, the Contractor may moderate the amount of sounding and form removal, when approved.

Provide all facilities for the safe and convenient conduct of the inspection procedures.

400-6 Underdrain and Weep Holes.

Provide weep holes in all abutments and retaining walls.

Provide a continuous underdrain for box culverts in accordance with Design Standard Index No. 289. Provide weep holes that are at least 3 inches in diameter and not more than 10 feet apart. Place the outlet ends of the weep holes just above the ground line in front of abutments and retaining walls. Cover the exterior openings of all weep holes with galvanized wire mesh and a minimum of 2 cubic feet of clean, broken stone or gravel wrapped in Type D 3 filter fabric, to allow free drainage but prevent the fill from washing through.

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400-7 Placing Concrete.

400-7.1 Weather Restrictions:

400-7.1.1 Concreting in Cold Weather: Do not place concrete when the air temperature at placement is below 40°F.

Meet the air temperature requirements for mixing and placing concrete in cold weather as specified in Section 346. During the curing period, if NOAA predicts the ambient temperature to fall below 35°F for 12 hours or more or to fall below 30°F for more than 4 hours, enclose the structure in such a way that the air temperature within the enclosure can be kept above 50°F for a period of 3 days after placing the concrete or until the concrete reaches a minimum compressive strength of 1,500 psi.

Assume all risks connected with the placing and curing of concrete.

Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Department.

400-7.1.2 Concreting in Hot Weather: Meet the temperature requirements and special measures for mixing and placing concrete in hot weather as specified in Section 346.

When the temperature of the concrete as placed exceeds 75°F, incorporate in the concrete mix a water-reducing retarder or water reducer if allowed by Section 346.

Spray reinforcing bars and metal forms with cool fresh water just prior to placing the concrete in a method approved by the Engineer.

Assume all risks connected with the placing and curing of concrete.

Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Department.

400-7.1.3 Wind Velocity Restrictions: Do not place concrete for bridge decks if the forecast of average wind velocity at any time during the planned hours of concrete placement exceeds 15 mph. Obtain weather forecasts from the National Weather Service "Hourly Weather Graph" for the city closest to the project site.

400-7.2 Lighting Requirements: Provide adequate lighting for all concrete operations conducted at night. Obtain approval of the lighting system prior to starting the concrete operations.

400-7.3 Inspections before Placing Concrete: Do not place concrete until the depth and character of the foundation and the adequacy of the forms and falsework have been approved by

the Engineer. Do not deposit any concrete until all reinforcement is in place and has been inspected and approved by the Engineer.

400-7.4 Exposure to Water: Do not expose concrete other than seal concrete in cofferdams to the action of water before final setting. Do not expose such concrete to the action of salt or brackish water for a period of seven days after placing the concrete. Protect the concrete during this period by keeping salt or brackish water pumped out of cofferdams.

400-7.5 General Requirements for Placing Concrete: Deposit concrete as nearly as possible in its final position. Do not deposit large quantities at one point and then run or work it along the forms. Take special care to fill each part of the forms, to work coarse aggregate back from the face, and to force concrete under and around reinforcing bars without displacing them. Use a method and manner of placing concrete that avoids the possibility of segregation or separation of aggregates. If the Engineer determines that the quality of concrete as

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it reaches its final position is unsatisfactory, remove it and discontinue or adjust the method of placing until the Engineer determines that the quality of the concrete as placed is satisfactory. Use metal or metal-lined open troughs or chutes with no aluminum parts in contact with the concrete. As an exception, chutes made of aluminum with a protective coating for ready mixed concrete trucks, no longer than 20 feet, may be used. This exception does not apply to any other means of concrete conveyance. Where steep slopes are required, use chutes that are equipped with baffles or are in short lengths that reverse the direction of movement. Where placing operations would involve dropping the concrete freely more than 5 feet, deposit it through pipes, troughs, or chutes of sheet metal or other approved material. Use troughs, chutes, or pipes with a combined length of more than 30 feet only with the Department's authorization. Keep all troughs, chutes, and pipes clean and free from coatings of hardened concrete by thoroughly flushing them with water after each run or more often if necessary.

Place concrete against supporting material that is moist at the time of concrete placement. If additional water is required, uniformly apply it ahead of the concrete placement as directed by the Engineer. Do not place concrete on supporting material that is frozen. The Contractor may use a moisture barrier in lieu of controlling the foundation grade moisture when approved by the Engineer.

400-7.6 Placing Concrete by Belt Conveyor: Place concrete by means of a belt conveyor system with written Department authorization. Remove conveyor belt systems which produce unsatisfactory results before continuing operations. Take concrete samples for assurance testing at the discharge end of the belt conveyor system. Make available to the Engineer the necessary platform to provide a safe and suitable place for sampling and testing. Remove any concrete placed in an unsatisfactory manner at no expense to the Department before continuing operations.

Use conveyor belt systems that do not exceed a total length of 550 feet, measured from end to end of the total assembly. Arrange the belt assembly so that each section discharges into a vertical hopper arrangement to the next section. To keep segregation to a minimum, situate scrapers over the hopper of each section to remove mortar adhering to the belt and to deposit it into the hopper. Equip the discharge end of the conveyor belt system with a hopper and a chute or suitable deflectors to cause the concrete to drop vertically to the deposit area.

In order to avoid delays due to breakdowns, provide stand-by equipment with an alternate power source prior to the beginning of the placement.

After the beginning of the placement, direct the discharge from the belt conveyor so that the concrete always falls on freshly placed concrete.

400-7.7 Placing Concrete by Pumping: In general, use concrete pumping equipment that is suitable in kind and adequate in capacity for the work proposed. Use a pump discharge line that has a minimum diameter of 4 inches. Use a pump and discharge lines that are constructed so that no aluminum surfaces are in contact with the concrete being pumped. Operate

the pump to produce a continuous stream of concrete, without air pockets. When using cement slurry or similar material to lubricate the discharge line when pumping begins, collect such material at the point of discharge. Dispose of the collected slurry in areas provided by the Contractor. Control the pump discharge locations so that the placement locations of the various LOTs of concrete represented by strength test cylinders can be identified in the event the test cylinders indicate deficient strength. When concrete is placed by pumping, take all test samples of concrete at the end of the discharge line, except in accordance with the provisions of Section 346.

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400-7.8 Consolidation: Consolidate the concrete by continuous working with a suitable tool in an acceptable manner, or by vibrating as set forth in 400-7.11. When not using vibrators, thoroughly work and compact all thin-section work with a steel slicing rod. Spade all faces, and flush the mortar to the surface by continuously working with a concrete spading implement.

400-7.9 Obstructions: In cases where, because of obstructions, difficulty is encountered in puddling the concrete adjacent to the forms, bring the mortar content of the mix into contact with the interior surfaces by vibrating the forms. Produce the vibrations by striking the outside surfaces of the forms with wooden mallets or by other satisfactory means. In placing concrete around steel shapes place it only on one side of the shape until it flushes up over the bottom flange of the shape on the opposite side, after which place it on both sides to completion. After the concrete has taken its initial set, exercise care to avoid jarring the forms or placing any strain on the ends of projecting reinforcing bars.

400-7.10 Requirements for Successive Layers: Place concrete in continuous horizontal layers, approximately 20 inches thick. To avoid obtaining a plane of separation or a cold joint between layers, vibrate the concrete in accordance with 400-7.11.

400-7.11 Vibration of Concrete:

400-7.11.1 General: Consolidate all concrete except seal, steel pile jackets, and concrete for incidental construction by the use of mechanical vibrators.

400-7.11.2 Vibrators: Provide adequate vibrators on the project that are approved by the Engineer before beginning concrete work. Generally, provide vibrators of the internal type. For thin sections, where the forms are especially designed to resist vibration, the Contractor may use external vibrators. Use a vibrator with a minimum frequency of 4,500 impulses per minute with sufficient intensity and duration to cause complete consolidation of the concrete without causing segregation of the materials. For vibrating thin, heavily reinforced sections, use heads of such size to secure proper vibration of the concrete without disturbance of either the reinforcing bars or the forms.

400-7.11.3 Number of Vibrators Required: Use a sufficient number of vibrators to secure the compaction of each batch before the next batch is delivered, without delaying the delivery. In order to avoid delays due to breakdowns, provide at least one stand-by vibrator, with an appropriate power source.

400-7.11.4 Method of Vibration: Use vibrators to consolidate properly placed concrete. Do not use them to move concrete about in the forms. Insert the vibrators in the surface of concrete at points spaced to ensure uniform vibration of the entire mass of the concrete. Insert the vibrator at points that are no further apart than the radius over which the vibrator is visibly effective. Allow the vibrator to sink into the concrete by its own weight, and allow it to penetrate into the underlying layer sufficiently so that the two layers are thoroughly consolidated together. After thoroughly consolidating the concrete, withdraw the vibrator slowly to avoid formation of holes.

400-7.11.5 Hand Spading: When necessary in order to secure well-filled forms, free from aggregate pockets, honeycomb, bubbles, etc., spade the concrete by hand, along the surfaces of the forms and in all corners, following the vibration.

400-7.12 Columns: Place concrete in columns in one continuous operation for each lift

as shown in the Plans.

400-7.13 Slabs and Bridge Decks:

400-7.13.1 Bulkheads, Screed Rails, and Screeding Devices: Strike-off the concrete using an approved metal screed operating on rails or bulkheads. Use devices which do
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not contain aluminum parts. Prior to placing concrete, provide an approved screed capable of striking-off and screeding the surface of the slab or deck to the required shape. Set all necessary bulkheads and screed rails to the required grade. Use bulkheads, screed rails, and screeding devices that permit vertical profile adjustment to the grade, satisfactory for providing straight transverse slopes, differing transverse slopes broken as shown in the Plans and/or transverse slopes with changing grade along the longitudinal length of slab or deck. Locate the screed rails so the entire placement surface can be screeded to grade without using intermediate screed rails, unless approved otherwise by the Engineer.

Use a screed consisting of a truss or heavy beams that will retain its shape under all working conditions, and a set of rotating drums with a diameter sufficient to carry a 2 inch mortar roll in front of and parallel to the axis of the drums, while making an initial pass. Adjust the drums to prevent mortar buildup forming behind the trailing edges of the drums. For long bridges, as defined in 400-15.2.5.1, provide a device that automatically smooths the concrete surface to an untextured finish and that is attached to, and is moved by, the rolling drum screed. As an alternate to the drum type screed, a mechanical screed with a metal strike-off may be used. Equip the mechanical screed with mechanical vibrators to provide continuous uniform vibration to the entire length unless otherwise authorized by the Engineer. Small and irregularly shaped areas that cannot be mechanically screeded may be screeded in a manner approved by the Engineer.

400-7.13.2 Screed Demonstration: Subsequent to the placement of all reinforcing bars 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.

400-7.13.3 Screeding Operations: Perform concrete placement and screeding as independently controlled mechanical operations. Ensure that the passing of the screed and forward movement of the screeding equipment are independent of the movement of concrete placement equipment.

Level the concrete in front of the screed as near to the finished grade as possible to prevent the screed from rising off the rail and forming uneven ridges behind the screed. Pass the screed over the slab or deck as many times as necessary to obtain a satisfactory surface and provide a concrete surface true to grade and crown, and free of irregularities.

Do not add water to the concrete surface to assist in finishing operations unless specifically authorized by the Engineer. If the Engineer permits the addition of water, apply only a fog mist, above the concrete surface, by means of approved power driven spray equipment.

For long bridges, as defined in 400-15.2.5.1, do not manually or mechanically float the concrete surface or apply a texture by broom or any other device to the concrete surface produced by the screeding process. Correct isolated surface irregularities in accordance with 400-15.2.5.3.

400-7.13.4 Placing Operations: Select an approved concrete design mix which ensures complete placement of all slab or deck concrete between construction joints before initial set begins in the plastic concrete. On placements of 50 yd³ or less, the minimum placement rate is 20 cubic yards per hour. On placements of greater than 50 cubic yards, the minimum placement rate is 30 cubic yards per hour.

The Engineer will not permit slab or deck placements until an acceptable plan for meeting the minimum placement rate is approved.

400-7.13.5 Concrete Decks on Steel Spans: Where concrete decks are placed on steel spans, release the temporary supports under the bridge before placing any concrete.

400-7.13.6 Concrete Decks on T-Beams: For cast-in-place T-beam construction, cast the slabs and beams in one continuous operation. As an exception, where special shear anchorage or keys are provided for in the Plans or approved by the Engineer, the beams and slabs may be constructed in successive placements.

400-7.13.7 Diaphragms: Place concrete diaphragms at least 48 hours before the bridge deck slabs are placed unless otherwise indicated in the Plans.

400-7.13.8 Weather Protection: Provide an approved means of protecting unhardened concrete from rain. Position the protection system to shield the concrete from rain and running water. Provide a shield impervious to water over the slab or deck concrete, of sufficient size to protect all areas of slab or deck concrete subject to water damage, and include a means of intercepting and diverting water away from freshly placed concrete. Arrange the equipment so that the weather protection system can be erected over unhardened concrete. When there is a possibility of rain during concrete placement operations, place the weather protection system in stand-by readiness, capable of being deployed in a timely manner. Use the weather protection immediately when rain begins so that slab or deck concrete damage will not occur. Do not place concrete during rain.

Assume responsibility for damage to the slab or deck in the case of failure of the weather protection system.

400-7.14 Concrete Box Culverts: In general, place the base slab or footing of concrete box culverts, and allow them to set before constructing the remainder of the culvert. In this case, make suitable provision for longitudinal keys. Construct bottom slabs, footings, and apron walls as a monolith if practicable. Where transverse construction joints are necessary, place them at right angles to the culvert barrel, and make suitable provision for keys.

In the construction of box culverts having walls 6 feet or less in height, the sidewalls and top slab may be constructed as a monolith or may place the concrete in the walls and allow it to set before placing the top slab concrete.

Where the height of the box culvert walls exceed 6 feet, place the walls, and allow the concrete to set at least 12 hours before placing the top slab concrete. In such cases, form keys in the sidewalls.

When casting the walls and top slabs of box culverts as a monolith, ensure that any necessary construction joints are vertical. Design all construction joints with formed keys. Provide keys that are beveled as shown in the Plans or as directed, but do not allow the edge of the beveled material forming the key to be less than 1 1/2 inches from the edge of the concrete. Construct each wingwall, if possible, as a monolith. Ensure that construction joints, where unavoidable, are horizontal and so located that no joints will be visible in the exposed face of the wing above the ground line.

Precast box culvert sections may be used in lieu of cast-in-place box culvert construction provided the provisions in Section 410 are satisfied.

400-8 Seals.

400-8.1 General: Wherever practicable, dewater all foundation excavations, and deposit the concrete in the dry as defined in 455-15.2. Where conditions are encountered which render it

impracticable to dewater the foundation before placing concrete, the Engineer may authorize the construction of a concrete foundation seal of the required size. Then, dewater the foundation, and place the balance of the concrete in the dry.

When required to place seal concrete, the Contractor is responsible for the satisfactory performance of the seal in providing a watertight excavation for placing structural

concrete. The Department will provide and pay for the seal concrete as an aid to the construction of the structure. Repair seal concrete as necessary to perform its required function at no expense to the Department.

400-8.2 Method of Placing: Carefully place concrete deposited under water in the space in which it is to remain by means of a tremie, a closed-bottom dump bucket of not less than 1 cubic yard capacity, or other approved method. Do not disturb the concrete after depositing it. Deposit all seal concrete in one continuous placement. Do not place any concrete in running water, and ensure that all form work designed to retain concrete under water is watertight.

400-8.3 Use of Tremie: Use a tremie consisting of a tube having a minimum inside diameter of 10 inches, constructed in sections having water-tight joints. Do not allow any aluminum parts to have contact with the concrete. Ensure that the discharge end is entirely seated at all times, and keep the tremie tube full to the bottom of the hopper. When dumping a batch into the hopper, keep the tremie slightly raised (but not out of the concrete at the bottom) until the batch discharges to the bottom of the hopper. Stop the flow by lowering the tremie. Support the tremie such as to permit the free movement of the discharge end over the entire top surface of the work and to permit its being lowered rapidly when necessary to choke off or retard the flow. Provide a continuous, uninterrupted flow until completing the work. Exercise special care to maintain still water at the point of deposit.

400-8.4 Time of Beginning Pumping: Do not commence pumping to dewater a sealed cofferdam until the seal has set sufficiently to withstand the hydrostatic pressure, and in no case earlier than 72 hours after placement of the concrete.

400-9 Construction Joints.

400-9.1 Location: Make construction joints only at locations shown in the Plans or in the placement schedule, unless otherwise approved in writing. If not detailed in the Plans or placement schedule, or in case of emergency, place construction joints as directed.

400-9.2 Provisions for Bond and Transmission of Shear: Use shear key reinforcement where necessary to transmit shear or to bond the two sections together.

400-9.3 Preparations of Surfaces: Before depositing new concrete on or against concrete which has hardened, re-tighten the forms. Roughen the surface of the hardened concrete in a manner that will not leave loosened particles, aggregate, or damaged concrete at the surface. Thoroughly clean the surface of foreign matter and laitance, and saturate it with water.

400-9.4 Placing Concrete: Continuously place concrete from joint to joint. Carefully finish the face edges of all joints which are exposed to view true to line and elevation.

400-9.5 Joints in Sea Water or Brackish Water: For concrete placed in sea water or brackish water, do not place any construction joints between points 2 feet below the mean low water elevation and 6 feet above the mean high water elevation.

400-9.6 Joints in Long Box Culverts: For long concrete box culverts, vertical construction joints may be placed at a spacing not less than 30 feet. When using transverse construction joints, ensure that longitudinal reinforcing is continuous through the joint and that the joint is vertical.

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400-9.7 Crack Control Grooves in Concrete Bridge Decks: When the Plans require crack control grooves in the top surface of decks, either install a tooled "V" groove prior to initial concrete set or saw a groove using an early entry dry cut saw. When using an early entry dry cut saw, operate in accordance with the manufacturer's recommendations. Commence sawing as soon as the concrete has hardened enough to permit standing on the surface without leaving visible tracks or impressions and before uncontrolled concrete cracks occur.

400-10 Expansion Joints.

400-10.1 General: After meeting the smoothness criteria in 400-15, construct expansion joints to permit absolute freedom of movement. Carefully remove all loose or thin shells of mortar likely to cause a spall with movement at a joint from all expansion joints as soon as

possible.

400-10.2 Sealed Joints: Fill expansion joints with a preformed joint filler. Cut the filler to conform to the cross-section of the structure, and furnish it in as few pieces as practicable, using only a single piece in each curb section. Do not use small pieces that would tend to come loose. Prepare joints to be sealed and apply the sealer in accordance with approved manufacturer's directions.

400-10.3 Joint System Installation: Install expansion joints before or after the deck planing required by 400-15.2.5.5 following the manufacturer's instructions. When installed after deck planing, install the edge rail assemblies in the blockouts on a profile tangent between the ends of the deck and/or approach slab to within a plus 0 and minus 1/4 inch variation. When installed before deck planing, install the edge rail assemblies 3/8 inch, plus or minus 1/16 inch, below the top surface of the deck or approach slab to compensate for concrete removal during planing.

400-11 Contact and Bearing Surfaces.

400-11.1 Separation of Surfaces: In general, separate all contact surfaces between superstructure and substructure or end walls and between adjacent superstructure sections by a layer of ASTM D6380 Class S, Type III organic felt.

400-11.2 Finishing of Bearing Surfaces: Construct bearing surfaces (areas) to the tolerances as specified herein and in the other parts of the Contract Documents. When using neoprene bearing pads, finish the concrete surface to a uniform 'rough' texture using a burlap drag, fine bristle broom or float. For metal or high load rotational bearings, fill minor depressions, 1/8 inch maximum, caused by finishing, bush hammering, or grinding with a lowviscosity epoxy meeting the requirements of 926-1, Type F-2, applied by the use of a squeegee.

Bearing surfaces may be ground to final position with carborundum. Check all bearing surfaces with a metallic straightedge prior to setting bearings or neoprene pads.

400-11.2.1 Deviation from Specified Elevations for Steel Beam

Superstructures: Construct to the elevation shown on the Plans plus or minus 0.01 feet and do not exceed a 0.01 feet difference between specified elevations of bearing areas of adjacent bearings measured between the centerlines of bearing areas.

400-11.2.2 Deviation from Specified Elevations for Concrete Beam

Superstructures: Construct to the elevation shown on the Plans plus or minus 0.02 feet.

400-11.2.3 Projecting Irregularities: Projecting irregularities will not exceed 1/16 inch.

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400-11.2.4 Variations in Flatness for Neoprene Pads: In any direction, the pad is to be flat to within 1/16 inch. Pads designated to be sloped are not to deviate from the theoretical slope by the same amount.

400-11.2.5 Variations in Flatness for Metal or High Load Rotational

Bearings: Construct the bearing area to the tolerance indicated for the measured length along the orthogonal axes.

Bearing area length up to 30 inches long to plus or minus 1/16 inch.

Bearing area length over 30 inches up to 45 inches long to plus or minus 3/32 inch.

Bearing area length over 45 inches long to plus or minus 1/8 inch.

400-11.3 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. The Engineer will evaluate the degree of deformation and condition of bearing pads in the completed bridge on or before the final inspection required by 5-10 or when requested by the Contractor. As directed by the Engineer, correct horizontal bearing pad deformations that at the time of inspection exceed 50% of the bearing pad thickness or that the Engineer predicts will exceed 50% of the bearing pad thickness during future high or low temperature periods. Payment for this correction effort will be considered extra work in accordance with 4-3.

400-12 Anchor Bolts and Dowels.

Set anchor bolts and dowels as specified in Section 460.

Galvanize all anchor bolts as specified in Section 962.

400-13 Epoxy Bonding Compounds.

Where epoxy bonding compounds for bonding concrete are specified or required, apply the epoxy bonding materials only to clean, dry, structurally sound concrete surfaces. Provide surface preparation, application, and curing of epoxy bonding compound in strict accordance with the manufacturer's recommendations for each particular application. Use an epoxy bonding compound listed on the Department's APL.

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.

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Location of Concrete Placement

Minimum Time for Form

Removal for any Strength

Concrete*

Minimum (%) of 28-day

Compressive Strength for

Form Removal

(1) Deck slabs, top slabs of culverts and bottom of caps, forms under sidewalks, and safety curb overhangs extending more than 2 feet

(a) Class II (Bridge Deck) 7 days** 75**

(b) Class II (Other than Bridge Deck) 7 days 75

(c) Class III 7 days 70

(d) Class IV 7 days 60

(e) Class V 7 days 50

(2) Walls, piers, columns, sides of beams and other vertical surfaces 24 hours*** 50***

(3) Front face form of curbs 6 hours 70

* 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 C39 and ASTM C31. 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.

400-15 Finishing Concrete.

400-15.1 General Surface Finish (Required for All Surfaces): After placing and consolidating the concrete, strike-off all exposed surfaces to the lines and grades indicated in the Plans in a manner that will leave a surface of uniform texture free of undesirable surface irregularities, cavities, and other defects. Cut back metal ties supporting reinforcement, conduit, 389

and other appurtenances a minimum of 1 inch from finished surface. After removing excess mortar and concrete and while the concrete is still in a workable state, carefully tool all construction and expansion joints. Leave joint filler exposed for its full length with clean edges. Ensure that finished work in addition to that specified above is compatible and complementary to the class of surface finish required.

Remove all laitance, loose material, form oil and curing compound from exposed surfaces that do not require forming and from exposed surfaces requiring forming, after form removal. Remove fins and irregular projections flush with the surface. Clean, saturate with water, and fill all holes, tie cavities, honeycomb, chips and spalls. Prior to filling, prepare the surface to ensure that patching mortar will bond to the existing concrete. Exercise care during the roughening process to prevent excessive defacement and damage to the surface of the existing concrete. Use patching mortar blended from the mix ingredients of the existing concrete. Ensure the patching mortar closely matches the color of the existing concrete when fully cured. As an alternative, mortar consisting of the following materials may be used: 4 parts of ordinary gray portland cement, 1/2 part of white portland cement, 1 part of fly ash and 2 to 4 parts of sand. The blended mortar must closely match the color of the filled element once fully cured and the proportion of white portland cement may be adjusted to achieve as close a match as possible. Regardless of the type patching mortar used, provide a mortar surface closely resembling the existing surface.

Cure the newly placed mortar using a curing blanket or a Type I clear curing compound at a uniform coverage as recommended by the manufacturer, but not less than 0.06 gallon per square yard.

In the event unsatisfactory surfaces are obtained, repair these surfaces by methods approved by the Engineer or the affected concrete will be rejected. Repair any surface or remove rejected concrete at no expense to the Department.

400-15.2 Surface Finishes:

400-15.2.1 General: In addition to the general surface work specified for all exposed concrete surfaces, the Engineer may require one of the classes of surface finish listed

below. For all such exposed surfaces, begin finish work for the applicable class specified, along with the general finish work, immediately after removal of the forms. In order to further ensure the required quality of the finish, remove forms no later than the minimum time specified for the forms to remain in place. Satisfactorily repair finished concrete surfaces which are subsequently disfigured or discolored at no expense to the Department.

Provide the required class of surface finish for the various items of structural concrete as shown in the Plans.

400-15.2.2 Class 1 Surface Finish: As soon as the pointing has sufficiently set, thoroughly saturate the exposed surfaces with water, and rub them with a medium coarse carborundum stone. Continue rubbing until the surface has been ground to a paste and remove all form marks, irregularities, and projections. In this process, do not introduce any additive material other than water. After the rubbing has produced a smooth surface of uniform color, allow the material which has been ground to a paste to reset under proper curing conditions. Subsequently, as a second operation, re-saturate the concrete surfaces with water, and thoroughly rub them with a fine carborundum stone. Continue this rubbing until the surface has a smooth, fine grain texture of uniform color.

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The Contractor may substitute a Class 5 applied finish coating in accordance with 400-15.2.6 as an alternate surface finish on all areas where Class 1 surface finish is specified.

400-15.2.3 Class 2 Surface Finish: As soon as pointing has sufficiently set, thoroughly saturate the exposed concrete surfaces with water and rub them with a medium coarse carborundum stone. Continue rubbing until the surface has been ground to a paste and remove all form marks, irregularities, and projections. In this process, do not introduce any additive material other than water.

After rubbing has produced a smooth surface finish, of uniform color, carefully brush the material which has been ground to a paste to a uniform texture, and allow it to reset under proper curing conditions. Carefully protect these surfaces from disfigurement and discoloration during subsequent construction operations.

400-15.2.4 Class 3 Surface Finish: Where this surface finish is specified, use forms with a form liner. Where specified or required on the Plans, use No. 89 coarse aggregate for concrete.

After concrete has been placed in the forms and compacted, finish all exposed surfaces which are not contained by the forms to produce a surface texture as nearly equal to that produced by the form as practicable. Generally, finish unformed surfaces to a smooth, dense surface with a steel trowel.

Perform all work, including general surface finish work, in a manner that will preserve the same surface texture and color produced by the form liner. Pointed areas may be rubbed with a dry carborundum stone.

400-15.2.5 Class 4 Deck Finish:

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 feet), 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 feet) 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.

400-15.2.5.2 Plastic Surface Finish for Short and Miscellaneous

Bridges: After screeding is completed, check the surface of the plastic concrete with a 10 foot straightedge, positioning and half-lapping the straightedge parallel to the centerline to cover the entire surface. Immediately correct deficiencies of more than 1/8 inch, measured as an ordinate between the surface and the straightedge.

Finish the concrete surface to a uniform texture using a burlap drag, fine bristle broom or float. Finish the deck to a smooth surface having a sandy texture without blemishes, marks or scratches deeper than 1/16 inch.

400-15.2.5.3 Plastic Surface Finish for Long Bridges: Do not moisten, manually float or apply texture to the concrete surface after the screed, with attached smoothing device, has passed unless correction of isolated surface irregularities is warranted and this should 391

be done 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.

If the Engineer permits the addition of water when correcting flaws, apply moisture to the concrete surface only if required and only in the immediate vicinity of the isolated irregularity. Apply a quantity of moisture not greater than what is needed to facilitate correction of the irregularity and apply only a fog mist, above the concrete surface, by power driven spray equipment approved by the Engineer.

400-15.2.5.4 Smoothness Requirements for Short Bridges and Miscellaneous Bridges (including approach slabs): Perform a final straightedge check with a 10 foot straightedge, positioning and half-lapping the straightedge parallel to the centerline, approximately 5 feet apart to cover the entire surface. Correct all irregularities greater than 3/16 inch measured as an ordinate to the straightedge, by grinding. Perform grinding by the abrasive method using hand or power tools or by machine, to leave a smooth surface within a 1/8 inch tolerance.

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 E1274) 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.

400-15.2.5.6 Grooving: After the concrete surface profile, as required by 400-15.2.5, has been accepted by the Engineer, and prior to opening the bridge to traffic, groove the bridge deck and approach slabs perpendicular to the centerline of the structure. Do not groove the deck surface of pedestrian or trail bridges unless otherwise shown in the Contract Documents. Cut grooves into the hardened concrete using a mechanical saw device which will leave grooves nominally 1/8 inch wide and 3/16 inch deep. Space the grooves apart in random spacing center of grooves in the following sequence: 3/4 inch, 1-1/8 inch, 5/8 inch, 1 inch, 5/8 inch, 1-1/8 inch, 3/4 inch in 6 inch repetitions across the width to be grooved in one pass of the mechanical saw device. One 6 inch sequence may be adjusted by 1/4 sequence increments to accommodate various cutting head widths provided the general pattern is carried out. The tolerance for the width of the grooves is plus 1/16 inch to minus 0 inch and the tolerance for the depth of grooves is plus or minus 1/16 inch. The tolerance for the spacing of the grooves is plus or minus 1/16 inch.

Cut grooves continuously across the deck or approach slab to within 18 inches of gutter lines at barrier rail, curb line and median divider. At skewed metal expansion joints in bridge deck surfaces, adjust groove cutting by using narrow width cutting heads so that all grooves of the bridge deck surface or approach slab surface end within 6 inches, measured normal to centerline of the joint, leaving no ungrooved surface adjacent to each side of the joint greater than 6 inches in width. Ensure that the minimum distance to the first groove, measured normal from the edge of the concrete joint or from the junction between the concrete and the metal leg of the armored joint angle, is 1 inch. Produce grooves that are continuous across construction joints or other joints in the concrete surface less than 1/2 inch wide. Apply the same procedure described above where the gutter lines at barrier rails, curb lines and median dividers are not parallel to the centerline of the bridge to maintain the 18 inches maximum dimension from the grooves to the gutter line. Cut grooves continuously across formed concrete joints.

400-15.2.6 Class 5 Applied Finish Coating:

400-15.2.6.1 General: Place an applied finish coating upon all concrete surfaces where the Plans indicate Class 5 Applied Finish Coating. Apply the finish coating after completion of the general surface work specified for all exposed concrete surfaces. Select an Applied Finish Coating from the APL meeting the requirements of Section 975.

400-15.2.6.2 Material: For the coating material, use a commercial product designed specifically for this purpose. Use only coating material that is manufactured by one manufacturer and delivered to the job site in sealed containers bearing the manufacturer's original labels. Submit the manufacturer's written instructions to the Engineer.

400-15.2.6.3 Surface Preparation: Prepare the surface prior to the application of an applied finish coating by providing a surface finish in accordance with the requirements of 400-15.1. The Engineer will not require surface voids that are 1/4 inch or less in width and depth to be grouted prior to application of the finish coating. Fill surface void larger than 1/4 inch in width and depth an approved high strength, non metallic, non shrink grout meeting the requirements of Section 934, mixed and applied in accordance with the manufacturer's recommendations. Apply the grout by filling the surface voids using burlap pads, float sponges, or other acceptable methods. As soon as the grout has taken its initial set, brush the surface to remove all loose grout, leaving the surface smooth and free of any voids. Ensure that the surface to be coated is free from efflorescence, flaking coatings, curing compound, dirt, oil, and other substances deleterious to the applied finish coating. Prior to application of the finish coating onto precast or cast-in-place concrete surfaces, test the concrete surface at 30 foot intervals for the presence of curing compound using one or two drops of muriatic acid placed on the concrete surface. If curing compound is present, there will be no reaction between the acid and the concrete. If there is no reaction, remove the compound by pressure washing the concrete surfaces. Prepare the surfaces in accordance with the manufacturer's recommendations, and ensure that they are in a condition consistent with the manufacturer's requirements. Clean surfaces of existing structures in accordance with 400-19.

400-15.2.6.4 Application: Apply the finish coating utilizing a method recommended by the manufacturer. When applying the finish coating by spraying, supply heavy duty spray equipment capable of maintaining a constant pressure necessary for proper application. Mix and cure all coating materials in accordance with the manufacturer's written instructions. Apply the finished coating at a rate of 50, plus or minus 10 square feet per gallon.

400-15.2.6.5 Finished Product: Produce a texture of the completed finish coat that is generally similar to that of rubbed concrete. Ensure that the completed finished coating is tightly bonded to the structure and presents a uniform appearance and texture. If necessary, apply additional coats to produce the desired surface texture and uniformity. Upon failure to adhere positively to the structure without chipping, flaking, or peeling, or to attain the desired surface appearance, remove coatings entirely from the structure, and reapply the finish coating after surface preparation until achieving the desired finished product. Do not allow the average thickness of the completed finish coating to exceed 1/8 inch.

400-15.2.6.6 Material Tests and Certification: Before any portion of any shipment of finish coating is applied on the project, submit to the Engineer a certificate from the manufacturer attesting that the commercial product furnished conforms to the same formula as that previously subjected to the tests specified in Section 975. In addition, submit the following product analysis, obtained from the manufacturer, for each batch of the material used:

1. Weight per gallon.
2. Consistency (Krebs Units).
3. Weight percent pigment.
4. Weight percent vehicle solids.
5. Infra-red spectra of vehicle solution.

400-15.2.7 Final Straightedging for Surfaces to Receive Asphalt Concrete

Surface: Test the slab surfaces of poured-in-place decks which are to be surfaced with an asphalt concrete wearing course for trueness with a 10 foot straightedge, as specified above. As an exception, correct only irregularities of more than 1/4 inch measured as an ordinate (either above or below the general contour of the surface). The Engineer will not require belting or

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brooming of slabs that are to be surfaced with an asphalt concrete wearing course. For curing, meet the requirements specified for other deck slabs.

400-15.2.8 Finishing Bridge Sidewalks: Finish bridge sidewalks in accordance

with the applicable requirements of Section 522.

400-16 Curing Concrete.

400-16.1 General: Cure cast-in-place and precast (non-prestressed) concrete as required herein for a minimum duration of 72 hours. If forms are loosened or removed before the 72 hour curing period is complete, expand the curing to cover these surfaces by either coating with curing compound or extending the continuous moist cure area.

Until curing has begun, retain concrete surface moisture at all times by maintaining a surface moisture evaporation rate less than 0.1 pound per square foot per hour. Periodically, at the site of concrete placement prior to and during the operation, measure the ambient air temperature, relative humidity and wind velocity with industrial grade weather monitoring instruments to determine the on-site evaporation rate. If the evaporation is, or is likely to become 0.1 pound per square foot per hour or greater, employ measures to prevent moisture loss such as application of evaporation retarder, application of supplemental moisture by fogging or reduction of the concrete temperature during batching. Compute the evaporation rate by using the nomograph in the ACI manual of Concrete Practice Part 2, Section 308R Guide to Curing Concrete, or by using an evaporation rate calculator approved by the Engineer.

400-16.2 Methods: Except where other curing methods are specified, select from the following options the chosen method(s) for curing all concrete components.

1. Continuous Moisture: Place burlap on the surface and keep it continuously saturated for the curing period by means of soaker hoses or automatic sprinklers. Water flow may be metered to cycle repetitively for five minutes on and five minutes off during the 72 hour curing period. Do not apply moisture manually. If side forms are loosened or removed during the curing period, extend the burlap so as to completely shield the sides of the members.

2. Membrane Curing Compound: Apply a white Type 2 curing compound to all surfaces at a uniform coverage as recommended by the manufacturer but not less than 0.06 gallon per square yard. Allow surfaces covered by the membrane curing compound to remain undisturbed for the curing period. Recoat any cracks, checks or other defects in the membrane seal which are detected during the curing period within one hour. If side forms are loosened during the curing period, maintain surface moisture and remove the forms within one hour and immediately coat the formed surfaces with a membrane curing compound. Bottom surfaces shall be similarly coated after removal of or from the forms.

If curing compound is to be applied by spraying, use a compressor driven sprayer of sufficient size to provide uniform mist. Standby equipment is required in case of mechanical failure and hand held pump-up sprayers may be used only as standby equipment.

3. Curing Blankets: Curing blankets may be used for curing the top surfaces of members while the member side forms remain in place. Do not use curing blankets which have been torn or punctured. Securely fasten all edges to provide as tight a seal as practical. Should the system fail to maintain a moist condition on the concrete surface, discontinue use of the blankets and continue curing using another method. Keep curing blankets in place for the duration of the curing period.

4. Accelerated Cure:

a. General: Accelerated curing of the concrete can be achieved by use of either low pressure steam curing, radiant heat curing or continuous moisture and heat curing. If accelerated curing is completed before the 72 hour curing period has elapsed, continue curing for the remaining part of the 72 hour curing period in accordance with one of the curing methods listed above.

If accelerated curing is used, furnish temperature recording devices that will provide accurate, continuous and permanent records of the time and temperature relationship throughout the entire curing period. Provide one such recording thermometer for each 200 feet of placement length or part thereof. Initially calibrate recording thermometers and recalibrate at least annually.

The preheating period shall equal or exceed the time of initial set as determined by ASTM C403 and shall not be less than 4 hours. When the ambient air temperature is above 50°F, allow the member to remain undisturbed in the ambient air for the preheating period. If the ambient air temperature is below 50°F, apply heat during the preheating period to hold the air surrounding the member at a temperature of 50 to 90°F.

To prevent moisture loss from exposed surfaces during the preheating period, enclose members as soon as possible after casting or keep the surfaces wet by fog mist or wet blankets. Use enclosures for heat curing that allow free circulation of heat about the member with a minimum moisture loss. The use of tarpaulins or similar flexible covers may be used provided they are kept in good repair and secured in such a manner to prevent the loss of heat and moisture. Use enclosures that cover the entire placement.

During the application or removal of the heat, do not allow the temperature rise or fall within the enclosure to exceed 40°F per hour. Do not allow the curing temperature throughout the enclosure to exceed 160°F. Maintain the curing temperature within a temperature range of 130 to 160°F until the concrete has reached the required form removal strength for precast and cast-in-place components or the required release strength for prestressed concrete components.

b. Low-Pressure Steam: The steam used shall be in a saturated condition.

Do not allow steam jets to impinge directly on the concrete, test cylinders, or forms. Cover control cylinders to prevent moisture loss and place them in a location where the temperature is representative of the average temperature of the enclosure.

c. Curing with Radiant Heat: Apply radiant heat by means of pipes circulating steam, hot oil or hot water, or by electric heating elements. Do not allow the heating elements to come in direct contact with the concrete or the forms. Distribute sources of heat in a manner that will prevent localized high temperatures above 160°F. To prevent moisture loss during curing, keep the exposed surfaces wet by fog mist or wet blankets.

d. Continuous Moisture and Heat: This method consists of heating the enclosure in combination with the continuous moisture method described above.

In addition to the curing blankets, an auxiliary cover for retention of the heat will be required over the entire placement. Support this cover at a sufficient distance above the placement being cured to allow circulation of the heat.

400-16.3 Silica Fume Concrete: Cure silica fume concrete a minimum of 72 hours using continuous moisture cure. No substitution of alternative methods nor reduction in the time period is allowed. After completion of the 72 hour curing period, apply a membrane curing compound to all concrete surfaces. Apply curing compound according to 400-16.2.

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400-16.4 Bridge Decks and Approach Slabs: Cure bridge decks and approach slabs for a duration of seven days. Apply a membrane curing compound to the top surface in accordance with 400-16.2 using a compressor driven sprayer. In general, apply curing compound when the surface is damp and after all pooled water has evaporated. For Short bridges, begin applying curing compound immediately after the initially placed concrete has been floated, straightedged, textured and a damp surface condition exists and continue applying compound as concrete placement progresses with as little interruption as possible until the entire top surface has been coated with compound. For Long bridges, begin applying curing compound to the initially placed concrete as soon as a damp surface condition exists and continue applying compound as concrete placement progresses with as little interruption as possible until the entire top surface has been coated with compound. For all bridges, the elapsed time between the initial placement of deck or approach slab concrete and the completed application of curing compound must not exceed 120 minutes. The 120 minute limit may be extended by the Engineer if project specific factors (cool temperatures, high humidity, retarding admixtures, etc.) prolong wet surface conditions.

Prior to the first deck or approach slab placement, submit to the Engineer the method that will be used to periodically measure the rate of application of curing compound in gallons per square foot as the concrete placement progresses. Prior to the placement of each deck or approach slab, submit to the Engineer the anticipated quantity of curing compound in gallons along with the corresponding square feet of concrete to be covered to meet the coverage rate in 400-16.2. Compute the actual quantity of curing compound applied at the conclusion of each concrete placement and submit the quantity to the Engineer. Apply the curing compound from a work platform.

Place curing blankets on all exposed surfaces which are not formed as soon as possible with minimal effect on the surface texture. Place the curing blankets with sufficient overlapping seams to form an effective moisture seal. Before using curing blankets, mend tears, splits, or other damage that would make them unsuitable. Discard curing blankets that are not repairable. Wet all curing blankets immediately after satisfactorily placing them and maintain them in a saturated condition throughout the seven day curing period. Supply sufficient quantity of water meeting the requirements of Section 923 at the job site for wetting the blankets. Where a bridge deck or approach slab is to be subjected to walking, wheeling or other approved construction traffic within the seven day curing period, protect the curing blankets and the concrete surface from damage by placing wooden sheeting, plywood or other approved protective material in the travel areas.

When the ends of the curing blankets are rolled back to permit screeding of adjacent concrete, keep the exposed surfaces wet throughout the period of exposure.

Bridge deck bottom and side forms may be removed after 72 hours upon compliance with 400-14. Approach slab side forms may be removed after 72 hours. Apply membrane curing compound to all surfaces stripped of forms within one hour of loosening. Apply curing compound according to 400-16.2.

400-16.5 Construction Joints: Cure construction joint areas using either the continuous moisture or curing blankets method.

400-16.6 Traffic Barriers, Railings, Parapets and End Post: Ensure concrete is cured in accordance with 400-16.2(2), except that a clear Type 1-D curing compound that must contain a fugitive dye may be used in lieu of Type 2. If Type 1-D is used, its removal per 400-15.1 during finishing is not required. When construction is by the slip form method, coat all concrete surfaces with a curing compound that meets the requirements of 925-2, either within 30 minutes of extrusion or before the loss of water sheen, whichever occurs first. Ensure a curing compound coating period of not less than seven days after application. Prior to each concrete placement, submit to the Engineer the method that will be used to periodically measure the rate of application in gallons per square foot. Also, prior to each placement, submit to the Engineer the anticipated quantity of curing compound in gallons that will be used to meet the coverage rate specified in 400-16.2 along with the corresponding square footage of barriers, railings, parapets and end posts to be coated with that quantity. Measure the actual quantity of curing compound that is applied during each concrete placement and submit the quantity to the Engineer. Applied finish coatings, that are on the APL and that are flagged as permitted for use as a curing compound, may be used in lieu of a curing compound. If an applied finish coating is used in lieu of a curing compound, have a backup system that is in full compliance with 400-16.2(2) available at all times to ensure that an effective alternative system will be immediately available if the applied finish coating cannot be applied within 30 minutes of extrusion or before the loss of water sheen.

400-16.7 Removal of Membrane Curing Compounds: Provide the longest possible curing duration; however, remove curing compound on portions of members to be bonded to other concrete. Compounds may be removed by either sand or water blasting. Water blasting requires the use of water meeting the requirements of Section 923 and a minimum nozzle pressure of 2,900 psi.

400-17 Protection of Concrete.

400-17.1 Opening to Traffic: Do not open concrete bridge decks, approach slabs, or culverts to traffic for at least 14 days after concrete placement. During placement operations, concrete may be wheeled across previously placed slabs after they have set for 24 hours and plank runways are used to keep the loads over the beams.

400-17.2 Storing Materials on Bridge Slabs: Do not store heavy equipment or material, other than light forms or tools, on concrete bridge slabs or approach slabs until 14 days after they have been placed. Obtain approval from the Engineer prior to storing materials, tools or equipment on bridge decks at any time. Disperse any such loads to avoid overloading the structure.

400-17.3 Time of Placing Superstructure: Do not place the weight of the superstructure or beams on concrete substructure elements for at least 10 days after placement.

400-17.4 Alternate Procedure: As an alternative to the time delay periods set forth in 400-17.1 and 400-17.3, test cylinders may be prepared and tested by the Contractor in accordance with 346-5 and a determination made using one of the following methods:

1. When the cylinder test results indicate the minimum 28 day compressive strength shown in the Plans, concrete bridge decks, approach slabs, and culverts may be opened to traffic or the superstructure and beams may be placed on caps.
2. Submit signed and sealed calculations, prepared by a Specialty Engineer, demonstrating that the concrete caps can safely support the weight of the girders for the current concrete strength to the Engineer for approval.

In any event, comply with the curing provisions of 400-16.

400-18 Precast Planks, Slabs, and Girders.

400-18.1 General: Where so shown in the Contract Documents, the Contractor may construct concrete planks, slabs, girders, and other structural elements by precasting. In general, use a method that consists of casting structural elements in a casting yard, curing as specified in 400-16, transporting them to the site of the work, installing them on previously prepared supports and, where so shown in the Plans, joining them with poured-in-place slabs or keys. Handle and install precast prestressed members as specified in Section 450.

400-18.2 Casting: Cast precast elements on unyielding beds or pallets. Use special care in casting the bearing surfaces on both the elements and their foundations in order that these surfaces shall coincide when installing the elements. Check bearing surfaces on casting beds with a level and a straightedge prior to the casting. Similarly check corresponding surfaces on the foundations during finishing operations.

400-18.3 Poured-in-Place Keys: Where precast elements are to be joined with poured-in-place keys, carefully align the elements prior to pouring the keys.

400-18.4 Surface Finish: Finish the surface as specified in 400 15, except that where precast slabs and poured-in-place keys form the riding surface, give the entire surface a broomed finish.

400-18.5 Moving, Placing, and Opening to Traffic: Reinforced precast members may be moved from casting beds, placed in the structure, and opened to traffic at the ages shown in the following table:

Handling from casting beds to storage areas 7 days

Placing in structure 14 days

Opening to traffic:

Precast elements 14 days

Cast-in-place slabs over precast girders 14 days

Cast-in-place keys joining precast slabs 7 days

As an alternate procedure, in lieu of the time delay periods set forth above, test beams may be cast from representative concrete, and cure them identically with the concrete in the corresponding structural component. Test the test beams in accordance with ASTM C31 and

ASTM C78. When the test results indicate a flexural strength of 550 psi, or more, any of the operations listed above may proceed without completing the corresponding time delay period.

400-18.6 Setting Prestressed Slabs: Before permitting construction equipment on the bridge to erect slab units, submit sketches showing axle loads and spacing and a description of the intended method of setting slab units to the Engineer for approval. Do not use axle loads, spacing, and methods of setting which produce stresses in the slab units greater than the allowable stress.

400-18.7 Protection of Precast Elements: The Contractor is responsible for the safety of precast elements during all stages of construction. The Engineer will reject any precast elements that become cracked, broken, seriously spalled, or structurally impaired. Remove rejected precast elements from the work at no expense to the Department.

400-18.8 Form Material: Form material used to form hollow cores may be left in place. Ensure that the form material is neutral with respect to the generating of products harmful to the physical and structural properties of the concrete. The Contractor is responsible for any detrimental effects resulting from the presence of the form material within the precast element.

400-19 Cleaning and Coating Concrete Surfaces of Existing Structures.

For the purposes of this article, an existing structure is one that was in service prior to the start of the project to which this specification applies. For existing structures, clean concrete surfaces that are designated in the Contract Documents as receiving Class 5 applied finish coating by pressure washing prior to the application of coating. Use pressure washing equipment producing a minimum working pressure of 2,500 psi when measured at or near the nozzle. Do not damage or gouge uncoated concrete surfaces or previously coated concrete surfaces during cleaning operations. Remove all previously applied coating that is no longer adhering to the concrete or that is peeling, flaking or delaminating. Ensure that after the pressure wash cleaning and the removal of non-adherent coating, that the cleaned surfaces are free of efflorescence, grime, mold, mildew, oil or any other contaminants that might prevent proper adhesion of the new coating. After cleaning has been successfully completed, apply Class 5 Applied Finish Coating in accordance with 400-15.2.6 or as otherwise specified in the Plans.

400-20 Approach Slabs.

Construct approach slabs at the bridge ends in accordance with the applicable requirements of Section 350 using Class II (Bridge Deck) concrete. Place the reinforcement as specified in 350-7 and Section 415.

400-21 Disposition of Cracked Concrete.

400-21.1 General: The disposition of cracked concrete is described in this Article and applies to all cast-in-place concrete members, and once installed, to the precast and prestressed concrete members that are produced in accordance with 410, 450, 521, 534, 548 and 641.

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.

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. As an exception, all cracks in concrete bridge decks that are supported by beams or girders will be classified as nonstructural and repair will be in accordance with 400-21.5.1. However, if the Engineer determines that repair under 400-21.5.1 is unacceptable, repair in accordance with 400-21.5.2.

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.

400-21.4 Nonstructural Cracking Significance: The Engineer will determine the Cracking Significance. The Cracking Significance will be determined on the basis of total crack surface area as a percentage of total concrete surface area. Cracking significance will be categorized as Isolated, Occasional, Moderate or Severe according to the criteria in Tables 1 and 2. Cracking Significance will be determined on a LOT by LOT basis. A LOT will typically be made up of not more than 100 square feet and not less than 25 square feet of concrete surface area for structures other than bridge decks or typically not more than 400 square feet or not less than 100 square feet for bridge decks. A LOT will not extend beyond a single Elevation Range as shown in Table 1 or 2.

Review and comment on the Engineer's determination of Cracking Significance; however, the Engineer will make the final determination.

400-21.5 Repair Method: Repair or remove and replace cracked concrete as directed by the Engineer. Additional compensation or a time extension will not be approved for repair or removal and replacement of cracked concrete when the Engineer determines the cause to be the responsibility of the Contractor.

400-21.5.1 Nonstructural Cracks: Repair each crack using the method as determined by the Engineer for each LOT in accordance with Table 1 or 2. When further investigation is required to determine repair or rejection, either remove and replace the cracked concrete or submit a structural evaluation signed and sealed by the Contractor's Engineer of Record that includes recommended repair methods and a determination of structural capacity and durability to the Engineer. Upon approval by the Engineer, repair the cracked concrete. Upon approval by the Engineer use epoxy injection in accordance with Section 411 to repair cracks in a member inside a dry cofferdam prior to flooding of the cofferdam. "Reject and Replace" in Table 1 or 2 means there is no acceptable repair method.

400-21.5.2 Structural Cracks: Submit a structural evaluation signed and sealed by the Contractor's Engineer of Record that includes recommended repair methods and a determination of structural capacity and durability to the Engineer. Upon approval by the Engineer, repair the cracked concrete. Complete all repairs to cracks in a member inside a cofferdam prior to flooding the cofferdam.

400-22 Method of Measurement.

400-22.1 General: The quantities of concrete to be paid for will be the volume, in cubic yards, of each of the various classes shown in the Plans, in place, completed and accepted. The quantity of precast anchor beams to be paid for will be the number in place and accepted. The quantity of bridge deck grooving to be paid for will be the area, in square yards of bridge deck and approach slab, completed and accepted. The quantity of bridge deck grooving and planing to be paid for will be the area, in square yards of bridge deck and approach slab, completed and

accepted.

Except for precast anchor beams, for any item of work constructed under this Section and for which measurement for payment is not to be made by the volume of concrete, measurement and payment for such work will be as specified in the Section under which the work is specified in detail.

No separate payment will be made for obtaining the required concrete finish.

400-22.2 Calculation of Volume of Concrete:

400-22.2.1 Dimensions: The quantity will be computed by the plan dimensions of the concrete, within the neat lines shown in the Plans, except that no deduction will be made for weep holes, deck drains, or encroachment of inlets and pipes in box culverts, and no chamfers, scorings, fillets, or radii 1 1/2 in2 or less in cross-sectional area will be taken into account.

400-22.2.2 Pay Quantity: The quantity to be paid for will be the original plan quantity, measured as provided in 400-22.2.1, except that where the Plans call for an estimated quantity of miscellaneous concrete for contingent use, the contingent concrete will be measured as the actual quantity in place and accepted.

400-22.2.3 Items not Included in Measurement for Payment: No measurements or other allowances will be made for work or material for forms, falsework, cofferdams, pumping, bracing, expansion-joint material, etc. The volume of all materials embedded in the concrete, such as structural steel, pile heads, etc., except reinforcing bars or mesh, will be deducted when computing the volume of concrete to be paid for. For each foot of timber pile embedded, 0.8 cubic feet of concrete will be deducted. The cost of furnishing and placing dowel bars shall be included in the Contract unit price for the concrete.

400-22.2.4 Deck Girders and Beam Spans: In computing the volume of concrete in deck girders and beam spans, the thickness of the slab will be taken as the nominal thickness shown on the drawings and the width will be taken as the horizontal distance measured across the roadway. The volume of haunches over beams will be included in the volume to be paid for.

400-22.2.5 Stay-in-Place Metal Forms: When using stay-in-place metal forms to form the slab of deck girder and beam spans, the volume of concrete will be computed in accordance with the provisions of 400-22.2.4 except that the thickness of the slab over the projected plan area of the stay-in-place metal forms will be taken as the thickness shown on the drawings above the top surface of the forms. The concrete required to fill the form flutes will not be included in the volume of concrete thus computed.

400-22.3 Bridge Deck Grooving: The quantity to be paid for will be plan quantity in square yards, computed, using the area bound by the gutter lines (at barrier rails, curbs and median dividers) and the beginning and end of the bridge or the end of approach slabs, whichever is applicable, constructed, in place and accepted.

400-22.4 Bridge Deck Grooving and Planing: The quantity to be paid for will be plan quantity in square yards, computed, using the area bound by the gutter lines (at barrier rails, curbs and median dividers) and the beginning and end of the bridge or the end of approach slabs, whichever is applicable, constructed, in place and accepted.

400-22.5 Composite Neoprene Pads: The quantity to be paid for will be the original plan quantity, computed using the dimensions of the pads shown in the Plans.

400-22.6 Cleaning and Coating Concrete Surfaces: The quantity to be paid for will be the plan quantity in square feet for the areas shown in the Plans.

400-23 Basis of Payment.

400-23.1 Concrete:

400-23.1.1 General: Price and payment will be full compensation for each of the various classes of concrete shown in the proposal.

400-23.1.2 Concrete Placed below Plan Depth: Authorized concrete placed in seal or footings 5 feet or less below the elevation of bottom of seal or footing as shown in the

Plans will be paid for at the Contract price set forth in the proposal under the pay items for substructure concrete.

Authorized concrete used in seal (or in the substructure where no seal is used) at a depth greater than 5 feet below the bottom of seal or footing as shown in the Plans will be paid for as Unforeseeable Work.

Such payment will be full compensation for the cofferdam construction, for excavation, and for all other expenses caused by the lowering of the footings.

400-23.1.3 Seal Concrete Required but Not Shown in Plans: When seal concrete is required as provided in 400-8 and there is no seal concrete shown in the Plans, it will be paid for as Unforeseeable Work.

400-23.2 Precast Anchor Beams: Price and payment will be full compensation for the beams, including all reinforcing and materials necessary to complete the beams in place and accepted.

No separate prices will be allowed for the various types of anchor beams.

400-23.3 Reinforcing: Reinforcing bars, wires and mesh will be measured and paid for as provided in Section 415, except that no separate payment will be made for the welded wire reinforcement used in concrete jackets on steel piles or reinforcement contained in traffic railings, barriers, traffic separators or parapets. Where so indicated in the Plans, the Department will not separately pay for reinforcing used in incidental concrete work, but the cost of such reinforcement shall be included in the Contract unit price for the concrete.

400-23.4 Bridge Deck Grooving: Price and payment will be full compensation for all grinding, grooving, equipment, labor, and material required to complete the work in an acceptable manner.

400-23.5 Bridge Deck Grooving and Planing: Price and payment will be full compensation for all grooving, planing, equipment, labor, and material required to complete the work in an acceptable manner.

400-23.6 Composite Neoprene Pads: Price and payment will be full compensation for all work and materials required to complete installation of the pads.

400-23.7 Cleaning and Coating Concrete Surfaces: Price and payment will be full compensation for all work and materials required. The cost of coating new concrete will not be paid for separately, but will be included in the cost of the item to which it is applied.

400-23.8 General: The above prices and payments will be full compensation for all work specified in this Section, including all forms, falsework, joints, weep holes, drains, pipes, conduits, bearing pads, setting anchor bolts and dowels, surface finish, and cleaning up, as shown in the Plans or as directed. Where the Plans call for water stops, include the cost of the water stops in the Contract unit price for the concrete.

Unless payment is provided under a separate item in the proposal, the above prices and payments will also include all clearing and grubbing; removal of existing structures; excavation, as provided in Section 125; and expansion joint angles and bolts.

The Department will not change the rate of payment for the various classes of concrete in which steel or FRP may be used due to the addition or reduction of reinforcing.

The Department will not make an allowance for cofferdams, pumping, bracing, or other materials or equipment not becoming a part of the finished structure. The Department will not pay for concrete placed outside the neat lines as shown in the Plans.

When using stay-in-place metal forms to form bridge decks, the forms, concrete required to fill the form flutes, attachments, supports, shoring, accessories, and all miscellaneous items or work required to install the forms shall be included in the Contract unit price of the superstructure concrete.

400-23.9 Payment Items:

Payment will be made under:

Item No. 400- 0- Class NS Concrete – per cubic yard.

Item No. 400- 1- Class I Concrete - per cubic yard.
Item No. 400- 2- Class II Concrete - per cubic yard.
Item No. 400- 3- Class III Concrete - per cubic yard.
Item No. 400- 4- Class IV Concrete - per cubic yard.
Item No. 400- 6- Precast Anchor Beams - each.
Item No. 400- 7- Bridge Deck Grooving - per square yard.
Item No. 400- 9- Bridge Deck Grooving and Planing - per square yard.
Item No. 400-143- Cleaning and Coating Concrete Surfaces - per square foot.
Item No. 400-147- Composite Neoprene Pads - per cubic foot.

SECTION 411 EPOXY INJECTION OF CRACKS IN CONCRETE STRUCTURES

411-1 Description.

Inject epoxy into cracks in portland cement concrete.

411-2 Materials.

Meet the requirements of Section 926 and as follows:

Use Type E compound epoxy for injection.

Use Type F-1 compound epoxy for sealing crack surfaces in preparation for injection.

Use epoxy materials listed on the Department's Approved Product List (APL).

411-3 Equipment.

For the equipment used to inject the epoxy, meet the recommendations of the epoxy injection material manufacturer and the following requirements:

1. Use equipment that has the capacity to automatically proportion the material components within the mix ratio tolerances set by the epoxy materials manufacturer.
2. Use equipment that has the capacity to automatically mix the epoxy component materials within the pump and injection apparatus. The Engineer will not allow batch mixing.
3. Use equipment that has the capacity to inject the epoxy resin under controlled variable pressures up to 200 psi, with a pressure gauge mounted at or near the nozzle to indicate the actual working pressure.

411-4 Injection Personnel Qualifications.

Employ personnel trained in performing injection work similar to that required for the project to carry out the epoxy injection of cracks in concrete. Provide an on-site supervisor for the epoxy injection work who is qualified by one of the following methods:

1. Certified by the manufacturer of the epoxy injection material as having the necessary competence to accomplish the epoxy injection work in a satisfactory and safe manner in compliance with these Specifications.
2. They can furnish documented evidence that they have a minimum of three years experience of on-site supervision of similar epoxy injection work and a list of five contracts in which similar epoxy injection was acceptably completed. Ensure that the listed experience in on-site supervision and completed contracts contains the project name and location, names of contracting parties, the owner's name, brief description of the work, and dates of completion of the epoxy injection work.

Submit written evidence showing personnel training and the on-site supervisor's qualification to the Department prior to beginning any epoxy injection work.

411-5 Crack Surface Preparation and Cleaning Requirements.

Clean the area surrounding the cracks of all deteriorated concrete, efflorescence and other contaminants detrimental to the adhesion of the surface sealing epoxy compound. Clean the interiors of the cracks with air under sufficient pressure to remove loose materials entrapped within the crack including efflorescence.

411-6 Sealing Cracks for Epoxy Injection.

After cleaning, drill injection port holes using a swivel drill chuck and hollow drill bits, including a vacuum attachment which will remove dust and debris generated during drilling. Determine the spacing of the injection port holes by the size of the crack and the depth of the crack in the concrete substrate. Generally, space the injection ports from 4 to 8 inches apart. Determine the actual spacing of injection ports by field trials. Drill the holes to a minimum depth of 5/8 inch, exercising care in aligning the hole along the plane of the crack so that the hole follows the crack for the full 5/8 inch depth.

Insert the injection ports in the drilled holes approximately 1/2 inch, allowing for a small reservoir below the injection port.

After cleaning the cracks and drilling the injection port holes, seal the crack surface and the injection ports with suitable epoxy.

411-7 Epoxy Injection.

Inject the epoxy in accordance with the epoxy manufacturer's instructions. Determine the actual injection procedures and pressures in field trials, based on crack widths and depth into the substrate and sufficiency of the results.

411-8 Cleaning After Epoxy Injection.

Clean concrete surface areas of excess epoxy materials and injection ports after completing the epoxy injection work. Clean in a manner which will not damage the concrete by scraping, light sand blasting, grinding, use of solvents, or any other appropriate method approved by the Engineer. Clean excess materials so that no epoxy material or injection ports extend beyond the plane surface of the concrete.

411-9 Acceptance.

Drill three cores located in each day's work as directed by the Engineer. Take drilled core samples containing representative crack sizes. The Engineer will accept the epoxy injection work represented by the core samples when the core samples indicate that 90% of the crack void greater than 0.006 inch wide is filled with epoxy resin and the concrete of the core sample is bonded through the crack into a unit.

Reinject epoxy injection work which does not satisfy the acceptance criteria, and correct it as necessary at no expense to the Department. Install additional injection ports as required to achieve satisfactory reinjection of epoxy resin.

After the epoxy injection work is completed and accepted, fill the core holes with an epoxy mortar consisting of one part by volume epoxy injection resin and four parts by volume clean, dry sand. Supply the sand in moisture proof bags. Do not use previously opened bags of sand for making epoxy mortar. The Contractor may use one part by volume epoxy material for sealing with one part by volume clean, dry sand in lieu of the above.

411-10 Method of Measurement.

411-10.1 Epoxy Material: The quantity to be paid will be the volume, in gallons, authorized, injected, and accepted.

411-10.2 Inject and Seal Crack: The quantity to be paid will be the length, in feet, authorized and accepted, measured along the approximate centerline of the sealed crack.

411-11 Basis of Payment.

411-11.1 Epoxy Material: Price and payment will be full compensation for all work specified in this Section, including furnishing the epoxy material, and miscellaneous related costs, storage, handling, etc.

411-11.2 Inject and Seal Crack: Price and payment will constitute full compensation for furnishing all labor, equipment, incidentals and materials (except epoxy), for cleaning and sealing the crack, and all labor and equipment for injecting the crack.

411-11.3 Payment Items: Payment will be made under:

Item No. 411- 1 Epoxy Material – per gallon.

Item No. 411- 2 Inject and Seal Crack – per foot.

**SECTION 415
REINFORCING FOR CONCRETE**

415-1 Description.

Furnish and place steel and fiber reinforced polymer (FRP) reinforcing of the quality, type, size, and quantity designated. Obtain all FRP reinforcing bars from a producer on the Department's Production Facility Listing.

415-2 Materials.

Meet the following requirements:

Steel Bar Reinforcement	931-1.1
Steel Welded Wire Reinforcement	931-1.2
FRP Bar Reinforcement	932-3

415-3 Protection of Material.

415-3.1 Steel Reinforcing: Store steel reinforcement above the surface of the ground, upon platforms, skids, or other supports, and protect it from mechanical injury and surface deterioration. Ensure that the steel reinforcement is free from loose rust, scale, dirt, paint, oil, and other foreign material prior to incorporation into the work.

415-3.2 Fiber Reinforcing Polymer (FRP) Reinforcing: Store FRP reinforcement above the surface of the ground, in boxes or upon platforms, skids, or other supports, and protect it from mechanical injury and direct exposure to UV light. Ensure that the FRP reinforcement is free from dirt, paint, oil, and other foreign material prior to incorporation into the work.

415-4 Bending, Splicing, and Cutting.

415-4.1 Steel Reinforcing: Fabricate reinforcing bars as prescribed in the CRSI Manual of Standard Practice. Shop bend the reinforcement cold to the shapes indicated in the Plans. Do not bend the reinforcement to shape in the field. Minor bending adjustments may be performed in the field with the approval of the Engineer.

Do not hot bend or straighten, weld, or thermal cut reinforcing steel.

415-4.2 Fiber Reinforcing Polymer (FRP) Reinforcing: No field fabrication of FRP reinforcing bars is permitted except tying and field cutting per ACI 440.5. Do not bend or straighten, couple, thermal cut, or shear cut FRP reinforcing bars.

415-5 Placing and Fastening.

415-5.1 General: Unless otherwise specified in the Contract Documents, the tolerance for bar spacing is plus or minus 1 inch from the plan position and the tolerance for concrete cover is minus 1/4 inch or plus 1/2 inch from the plan dimensions. Construct all tie patterns referenced by this Section in accordance with the CRSI Manual of Standard Practice.

415-5.2 Concrete Blocks for Spacing: Use precast concrete blocks to space and support the reinforcing bars. Use concrete blocks with a strength equal to or greater than the concrete in which they are to be placed and have wires cast into them for fastening to the reinforcing bars. Moist-cure the blocks for at least three days.

Submit a certification verifying the class of concrete used to fabricate the concrete blocks, and identifying the batch and load of concrete from which the concrete blocks were cast.

415-5.3 Tying:

415-5.3.1 Steel Reinforcing: Tie steel reinforcing using pliable steel wire that readily bends and twists without breaking and that provides a tie of sufficient strength to hold the steel reinforcing in its proper position. Tie stainless reinforcing steel using plastic, polymer, or nylon coated pliable steel wire; or stainless steel wire meeting the requirements of ASTM A276, UNS S31600.

415-5.3.2 Fiber Reinforcing Polymer (FRP) Reinforcing: Tie FRP reinforcing using plastic, polymer, or nylon coated pliable steel wire that readily bends and twists without breaking and that provides a tie of sufficient strength to hold the FRP reinforcing in its proper position.

415-5.4 Splices: Where splices are authorized, rigidly clamp the bars or tie them in a manner meeting the Engineer's approval. Use the lap splice length as shown on the Plans.

415-5.4.1 Steel Reinforcing: Do not use welded splices for steel reinforcing except as specifically authorized by the Engineer and meeting the requirements of AWS D 1.4 Structural Welding Code - Reinforcing Steel.

Use mechanical couplers or splice devices for steel reinforcing that are listed on the Department's Approved Product List (APL).

415-5.4.2 Fiber Reinforcing Polymer (FRP) Reinforcing: Do not use mechanical couplers for FRP reinforcing. Use lap splices only.

415-5.5 Footings:

415-5.5.1 Supports: Support footing mat reinforcing with concrete blocks having dimensions not greater than 4 by 4 inches by plan clearance. Fasten concrete blocks to the steel using the cast-in wires.

415-5.5.2 Tolerances: Place footing mat reinforcing within 1/2 inch vertically from the plan bottom clearance and within 1 inch from the plan side clearance.

415-5.5.3 Tying: Tie footing mat reinforcing with a double-strand single tie at all intersections on the periphery and at alternate intersections within the mat.

415-5.6 Dowel Bars for Columns and Walls:

415-5.6.1 Supports and Positioning: Position dowel bars projecting into columns and walls so as to allow splicing of the vertical bars to the dowels and to tie the dowel bars in their plan position. Support the dowel bars by a rigid template such that concrete placement does not disturb their position. Support the reinforcing prior to placement of the footing concrete and do not insert dowel bars into the plastic concrete.

415-5.6.2 Tolerances: Place the dowels within 1/2 inch of their plan position and with a side clearance tolerance not exceeding 1/4 inch.

415-5.7 Verticals and Hoops for Columns:

415-5.7.1 Spacing-off from Side Forms: Space column reinforcing bars from the side forms by concrete blocks of dimensions not exceeding 2 inches by 2 inches by clearance dimension. Securely fasten each block to the reinforcing.

415-5.7.2 Tolerances and Clearance:

1. Column Verticals: Place column verticals within 1/2 inch of their plan position. Ensure that the side form clearance is within 1/4 inch of the specified clearance.
2. Column Hoops: Place every hoop within 1 inch of the plan position for the specific hoop, with no accumulation of such tolerance caused by the spacing between any two hoops. Ensure that side form clearance for any hoop is within 1/2 inch of its specified clearance.

415-5.7.3 Tying: Tie the column hoops to the column verticals at each intersection, by a cross tie or figure 8 tie.

415-5.8 Wall Reinforcing (Not Including Dowel Bars):

415-5.8.1 Supports: Space wall reinforcing bars from the side forms by concrete blocks of dimensions not greater than 2 inches by 2 inches by clearance dimensions. Fix the spacing between wall mats by means satisfactory to the Engineer.

415-5.8.2 Tolerance: Except when necessary to clear a fixture, place reinforcing bars within 1 inch of plan position. Ensure that the number of bars in any affected unit is as specified, and place the remainder of the bars (not thus affected) within 1 inch of plan location.

415-5.8.3 Tying: Tie retaining wall reinforcing bars with a cross tie or figure 8 tie at each intersection on the periphery and at every third intersection within the mat. If workmen use the reinforcing as a ladder, provide additional ties as directed by the Engineer.

Tie noise and perimeter wall reinforcing bars with a single tie at each intersection on the periphery and at every third intersection within the mat.

415-5.9 Beams and Caps:

415-5.9.1 Supports: Maintain bottom clearances by approved heavy beam bolsters. Support additional layers of main longitudinal reinforcing bars from the lower layers by heavy upper-beam bolsters, placed directly over low supports.

Begin the spacing of beam bolsters at not more than 2 feet from the end of the beams or caps and space the additionally required bolsters at not more than 4 feet.

Use concrete blocks, having dimensions not greater than 2 inches by 2 inches by specified clearance, fastened to the reinforcing bars by the cast-in wires, for spacing the upper main longitudinal bars below the top bars. Maintain the side clearance by concrete blocks, having dimensions not greater than 2 inches by 2 inches by required clearance, fastened to the reinforcing bars by the cast-in wires.

415-5.9.2 Tolerances: Place the main longitudinal reinforcing bars so as to provide a bottom and top clearance within 1/4 inch of the plan vertical dimensions for all layers.

Space the bars from side forms within 1/2 inch of the specified spacing.

Place stirrups within 1 inch of the plan position for each individual stirrup and do not allow the tolerance to accumulate.

415-5.9.3 Tying: Tie all intersecting bars with a double-strand single tie.

415-5.10 Deck Slabs:

415-5.10.1 Supports:

1. **Bottom Mats:** Support the bottom mat of reinforcing bars using slab bolsters or concrete blocks. Use one row of slab bolsters placed 6 inches from the edge of the slab and two rows down each deck section between beams. Do not allow the spacing between rows to exceed 4 feet, measured center to center.

Use concrete blocks 2 inches by 2 inches by clearance dimensions. Space concrete blocks 4 feet on center as a maximum.

2. **Top Mats:** Support the top mats of reinforcing bars by either continuous or individual high chairs. Provide high chairs along both sides of each beam and approximately 6 inches back from the edge of the beam. Place the outside row of high chairs 6 inches from the edge of the slab. If using individual high chairs, do not allow the longitudinal spacing to be greater than 4 feet.

As an alternate to the above, on prestressed beam construction, the Contractor may support the top mat of reinforcing bars on the shear connectors bent to the proper elevation with one line of high chairs centered between the beams.

3. **Truss Bars:** Support truss bars at each end of the top bends by continuous high chairs or by individual high chairs spaced longitudinally at not more than 4 feet.

415-5.10.2 Tolerances: Ensure that top and bottom clearances are within 1/4 inch from those shown in the Plans.

Ensure that end and bottom clearances are within 1/4 inch from those shown in the Plans.

Ensure that end and edge clearances are within 1/4 inch of the clearance specified.

Place curb bars within 1/4 inch in any direction of the plan position.

415-5.10.3 Tying: Tie all reinforcing bars in each layer with a double-strand single tie at every intersection on the periphery and at every third intersection in the interior area. If encountering difficulty in maintaining the reinforcing bars in position during the placing of concrete, tie additional intersections as necessary to hold the reinforcing bars secure.

415-5.11 Box Culverts:

415-5.11.1 Supports:

1. **Bottom Slabs:** In the bottom slabs of box culverts, provide supports for single-mat reinforcing bars and for bottom-mat reinforcing bars, including placement and spacing, as specified for footing mat steel in 415-5.5. In addition, where the Plans call for more than one mat of reinforcing bars in the bottom slab of the culvert, support the top mat away from

the bottom mat, either by upper beam bolsters or by other means satisfactory to the Engineer.

2. Walls: Place, space and support the reinforcing bars in walls of box culverts in accordance with the requirements of 415-5.8.

3. Top Slabs: In the top slabs of box culverts, support the bottom mats of reinforcing bars by a row of slab bolsters 12 inches from the inside face of the walls and with additional rows of bolsters at spacings not exceeding 4 feet, center to center. As an exception, unless the Engineer deems the use of the slab bolsters as necessary to obtain proper support, the Contractor may use concrete blocks as the supporting device. Use blocks of dimensions not greater than 2 inches by 2 inches by the required clearance, with spacings not exceeding 4 feet in any direction. Fasten blocks to the reinforcing steel by the cast-in wires.

4. Truss Bars: Support truss bars as specified in 415-5.10..

415-5.11.2 Tolerances: Use tolerances in placing the reinforcing bars in box culvert slabs as specified for deck slabs in 415-5.10. Use tolerances for placing bars in walls as specified in 415-5.8.

415-5.11.3 Tying: Tie reinforcing bars in box culverts as specified for deck slabs in 415-5.10.

415-5.12 Cleaning: Before placing any concrete, clean all mortar from the reinforcement.

415-5.13 Bar Supports:

415-5.13.1 General: Provide reinforcing 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 without permanent deformation or breakage, with deflection less than 5% of the support height.

Ensure that no more than 5% of the reinforcing bar supports exhibit unsatisfactory performance, breakage, or permanent deformation during bar 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 bars.

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 removable forms or floor surfaces to support reinforcing bars.

415-5.13.2 Metal Bar Supports: For metal bar supports in contact with removable forms, provide supports constructed with molded plastic legs or plastic protected metal legs or bolster rails. Do not allow any portion of the bar support other than the molded plastic leg or plastic protected portion of the metal leg or bolster rail to be closer than 1/2 inch from the removable form surface for concrete to be cast.

Submit certification verifying 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.

2. That the plastic used for protection of the steel legs or bolster rails 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 during use.

Do not use metal bar supports to support FRP reinforcing bars.

415-5.13.3 Plastic Bar Supports and Spacers: Use non-stackable plastic bar supports and spacers. Bar supports shall be able to meet the concentrated load requirements of 415-5.13 within a working temperature range of 20 to 150°F. Spacers shall be able to provide sufficient strength to support reinforcing steel in the required position without deformation and relaxation under job conditions. For drilled shafts, use wheel spacers with a smooth perimeter surface.

Submit protection from sunlight until placed in the form and mold in a configuration which does not restrict concrete flow and consolidation.

All plastic bar supports and spacers shall have a maximum water absorption of 0.5% at 7 days as per ASTM D570. Plastic bar supports and spacers made of recycled plastic products must meet the additional requirements of Section 972.

Submit to the Engineer independent lab test data and certification verifying that the plastic spacers meet the requirements specified herein.

Use plastic bar supports listed on the Department's APL. Provide each individual bar support with an identification number unique to the particular model permanently marked on the surface as included in the APL. Manufacturers seeking evaluation of products for inclusion on the APL must submit an application in accordance with Section 6 and include certified test reports from an independent laboratory showing that the plastic bar supports meet all the requirements specified herein.

415-6 Welded Deformed Steel Wire Reinforcement.

415-6.1 General: Provide welded deformed steel wire reinforcement as shown in the Plans or as a substitute for deformed bar reinforcement when approved on the shop drawings. Propose substitutions of welded deformed steel wire reinforcement in a manner that provides a cross-sectional area per foot of welded deformed steel wire equal to that provided in the Plans for deformed bar reinforcement. Orient the deformed wires of welded deformed steel wire reinforcement in the same position as bar reinforcement detailed in the Plans. Cross wires of welded deformed steel wire reinforcement may be deformed or smooth and must have a cross-sectional area at least 35% greater than the area of the deformed wire.

415-6.2 Design: When welded deformed steel wire reinforcement is substituted for deformed bar reinforcement, ensure that the development length, splices, shear reinforcement, and distribution meet the requirements of the AASHTO LRFD Bridge Design Specifications.

415-7 Method of Measurement.

415-7.1 Reinforcing Steel: The quantity to be paid for will be the plan quantity, in pounds, of reinforcing steel, stainless reinforcing steel, or low carbon chromium reinforcing steel incorporated into the completed work and accepted, subject to any changes approved by the Engineer. The quantity will not include the reinforcing steel (all types) in any item of work for which the basis of payment already includes the steel reinforcement. No additional payment will be made for substitutions of welded deformed wire reinforcement proposed by the Contractor. No separate payment will be made for reinforcing steel (all types) in pipe endwalls. No deduction will be made from reinforcing steel (all types) quantities for encroachment of inlets and pipes in box culverts. The lengths to be used in the calculation will be the detailed lengths of bars as shown in the Plans.

415-7.2 Unit Weights of Steel Bars: The unit weights used will be CRSI Standard Reinforcing Steel Bar Weights.

415-7.3 Welded Wire Reinforcement: Where welded wire reinforcement is to be paid for by weight, the quantity to be paid for will be the product of the area, in square feet, of the welded wire reinforcement incorporated into the completed work and accepted, multiplied by the manufacturer's standard weight per square foot.

When welded deformed steel wire reinforcement is substituted for deformed bar reinforcement, the quantity to be paid for will be the quantity which would be paid for if bar

reinforcement as detailed in the Plans were utilized, based on plan quantity.

415-7.4 Fiber Reinforcing Polymer (FRP) Reinforcing: The quantity to be paid for will be the plan quantity, in linear feet, of bar incorporated into the completed work and accepted, subject to any changes approved by the Engineer. The quantity will not include the FRP bar in any item of work for which the basis of payment already includes the FRP bars. The lengths to be used in the calculation will be the detailed lengths of bars as shown in the Plans.

415-8 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all welding, all clips, spacers, ties, mechanical couplers, etc., and wire or other material used for fastening the reinforcement in place.

If spliced bars are used when full length bars might reasonably be required, the weight paid for will be only that which would be obtained if full length bars were used, with no allowance for lap.

Payment will be made under:

Item No. 415- 1- Reinforcing Steel - per pound.

Item No. 415- 2- Stainless Reinforcing Steel – per pound.

Item No. 415- 3- Low Carbon Chromium Reinforcing Steel – per pound.

Item No. 415- 10- Fiber Reinforced Polymer Reinforcing Bar – per linear foot.

**SECTION 470
TIMBER STRUCTURES**

470-1 Description.

Furnish and erect treated timber into various structures.

470-2 Materials.

Meet the following requirements:

Timber Section 952

Preservative Section 955

Use timber as specified in the Plans.

470-3 Timber Handling.

Handle treated timber with rope slings, without sudden dropping, breaking of outer fibers, bruising, or penetration of the surface with tools. Do not use cant dogs, hooks, or pike poles.

470-4 Cutting and Framing.

Before treatment, cut and frame all timbers which are shown by the Plans to be furnished in special lengths or framed to detailed dimensions. Limit the cutting of treated timber to minor fitting which might be necessary and that is authorized by the Engineer. For all places where the surface is broken, by cutting or otherwise, thoroughly coat with the preservatives and by the methods specified in AWPA M4.

470-5 Bolt Holes.

The Contractor may drill holes in the field. For timbers originally treated with pentachlorophenol, creosote, creosote solutions, or waterborne preservatives, field treat all cuts, abrasions, bolt holes, and recesses that occur after treatment with two liberal applications of a compatible preservative in accordance with the requirements specified in AWPA Standard M4, Standard for the Care of Pressure-Treated Wood Products.

470-6 Pile Caps.

Ensure that pile caps have full even bearing on all piles in the bent, and secure them to each pile by a 3/4 inch diameter drift bolt extending at least 9 inches into the pile. Where so shown in the Plans, cover the tops and ends of pile caps with 10 ounce, minimum weight, copper sheet meeting the requirements of ASTM B370.

470-7 Floors.

Attach the planks to each joist or nailing strip with at least two 8 inch nails for 3 inch planks, or two 10 inch nails for 4 inch planks. Use nails that are at least 1/4 inch in diameter. For treated timber floors where a bituminous wearing surface is to be applied, lay the planks with the best side up and with adjacent edges in contact. Grade the planks as to thickness before laying, and lay the planks so that no two adjacent planks vary in thickness more than 1/8 inch. Cut the floor to straight lines along the side of the roadway and walkway.

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470-8 Framing.

Cut and frame truss and bent timbers to a close fit in such manner that they will have even bearing over the entire contact surface of the joint. Do not perform blocking or shimming of any kind in making the joints. The Engineer will not accept open joints.

470-9 Holes for Bolts, Dowels, Rods, and Lag Screws.

Bore holes to the diameters shown in the following table:

Hole use Hole diameter

Drift Bolts and Dowels 1/16 inch less in diameter than the bolt or dowel to be used

Machine Bolts same diameter as the bolt

Rods 1/16 inch greater in diameter than the rod

Lag Screws not larger than the body of the screw at the base of the thread

470-10 Stringers.

The Contractor may use butt joints for outside stringers, but shall frame interior stringers

to bear over the full width of floor beam or cap at each end. Separate the ends at least 1/2 inch to allow circulation of air, and securely fasten the ends to the timber on which they rest.

470-11 Railings.

Construct railings of treated dressed lumber.

470-12 Hardware.

470-12.1 General: Use hardware, including bolts, drift pins, dowels, rods, nuts, washers, spikes, nails and all similar incidental metal items, necessary to complete the work in accordance with the details shown in the Plans. Use common wire nails as commercially manufactured. Use ogee washers of cast or malleable iron. The Contractor may use other hardware of steel, iron, or any similar material ordinarily used in the manufacture of such articles.

470-12.2 CCA, ACQ-D, and CA-C, Treated Timber Structures: Use the fasteners and connectors as described in the following table:

TABLE – HARDWARE REQUIREMENTS FOR TREATED TIMBER

Environmental condition where

structure will be located Fasteners Connectors

Permanent wood foundations

and/or where salt spray if

prevalent

304 or 316 Stainless Steel 304 or 316 Stainless Steel

Structures that will be exposed

to standing water or rainwater 304 or 316 Stainless Steel 304 or 316 Stainless Steel

Structures that will be situated

indoors and remain dry in

service

304 or 316 Stainless Steel

Hot-dipped galvanized fasteners

meeting ASTM A-153

requirements

304 or 316 Stainless Steel

Hot-dipped galvanized

connectors meeting the

requirements of ASTM A-653

Class G185 sheet or better

Do not use aluminum in direct contact with treated wood.

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470-12.3 Bolts: Use bolts of the sizes shown in the Plans with square heads and nuts and with screw threads that make close fits in the nuts. Upon completion of the installation, check all nuts for tightness, and cut off protruding bolt ends so that not more than 1/4 inch extends beyond the nut.

470-12.4 Inspection: The Engineer will inspect the hardware for quality of manufacture and accuracy of size prior to use on wood structures.

470-13 Countersinking.

Perform countersinking wherever the heads of screws or bolts would otherwise interfere with the assembly of the work. Fill recesses formed by countersinking with hot asphalt.

470-14 Method of Measurement.

470-14.1 General: The quantity to be paid for will be the plan quantity, in feet board measure, of such timber actually incorporated in and forming a part of the completed structure.

470-14.2 Method of Calculation: For calculating the quantity of timber, the width and thickness will be taken as the actual sizes shown in the Plans or ordered by the Engineer. Where special sizing is required, the width and thickness to be used will be that of the smallest commercial size from which the special piece could be cut. Lengths to be used in the

calculations will be the overall lengths of the pieces as shown in the Plans, except that, where the lengths actually incorporated in the structure are less than the lengths shown in the Plans, the lengths actually incorporated will be used in the calculations. Deductions will not be made for copes, scarfs, or crownings.

470-15 Basis of Payment.

Prices and payments will be full compensation for all the work specified in this Section, including all copper covering over pile heads, caps, etc., as shown in the Plans, all hardware except such plates, lag screws, and other metal parts as may be shown in the Plans to be paid for as structural steel and all paint materials and all excavation, painting, and incidentals necessary to complete the work.

Payment will be made under:

Item No. 470- 1- Treated Structural Timber - per Thousand Board Measure.

**SECTION 506
BRIDGE DRAINAGE SYSTEM**

506-1 Description.

Construct drainage facilities and accessories to collect and dispose of water from drains on the bridge structures, in accordance with the details shown in the Plans.

506-2 Materials.

Use materials as specified or required in the Plans. For aluminum materials, submit a certified mill analysis, along with a certificate from the producer stating that the materials used meet all requirements of these Specifications. Submit such reports to the Engineer.

506-3 Method of Measurement.

The quantity for bridge drainage system to be paid for will be at the Contract lump sum price.

If bridge drainage piping is included in the Contract, the quantity to be paid for will be at the length, in feet.

If bridge drains are included in the Contract, the quantity to be paid for will be at the Contract unit price for each.

506-4 Basis of Payment.

Prices and payments will be full compensation for all work, equipment, and materials specified in this Section or shown in the Plans, including the complete installation of the drainage system for the bridge structure.

Payment will be made under:

Item No. 506- 1- Bridge Drainage System - lump sum.

Item No. 506- 2- Bridge Drainage Piping - per foot.

Item No. 506- 3- Bridge Drains - each.

SECTION 510 NAVIGATION LIGHTS FOR FIXED BRIDGES

510-1 Description.

Furnish and install navigation lighting systems, including all wiring, conduit, wiring devices, transformers, enclosures, grounding system, controls, protective devices, lights, etc., as shown in the Plans and in compliance with Code of Federal Regulations (CFR), Title 33, Part 118, which is further clarified in U.S. Coast Guard (USCG) Publication "A Guide to Bridge Lighting". Navigation lights must operate from sunset to sunrise and during periods of low visibility.

510-2 Coordination of Electrical Work.

Use experienced personnel in the type of work required by the Contract Documents to provide a complete and satisfactory fitting and fully operational installation. Perform all electrical work either by, or under the immediate supervision of an electrical journeyman. Schedule and arrange electrical work in a neat, well-organized manner without interference with the work scheduling of other trades.

510-3 Materials and Equipment.

Meet the equipment and material requirements as shown in the Contract Documents.

Furnish and install only materials and equipment of new stock meeting ANSI, NEC, NEMA, and UL requirements, and approved by the Engineer, except where the Contract Documents allow or specify the use of other than new equipment.

Furnish and install marine type products manufactured of corrosion resistant materials.

Furnish and install only fasteners manufactured from ASTM 316 stainless steel with yield strength 35,000 psi or higher.

Furnish and install ASTM 300 series stainless steel conduit straps or hangers held at not less than two points.

Furnish and install framework for supporting boxes, switches, and other externally mounted electrical devices fabricated from ASTM A709 Grade 36 hot-dip galvanized structural steel.

510-4 Navigation Lights and Aids.

510-4.1 Navigation Lights: Equip all navigation lights with a LED array with a minimum of 50,000 hour life and bright enough to meet the visibility requirements of CFR Title 33, Part 118. Mount LED arrays on an internal shock and vibration isolator. Provide, in the circuit, a lightning surge suppressor capable of absorbing multiple strikes without replacement. Provide special power supply to provide current limited DC voltage to the LED array. Furnish and install fixtures with unpainted housings of heavy duty cast aluminum or bronze construction with a 1-1/2 to 2 inch threaded conduit opening on the bottom. Use only marine type mounting boxes with minimum 3/4 inch conduit opening. Furnish and install fixtures with lenses that are standard marine molded, single-piece fresnel type, rigid, heat resistant glass or U.V. resistant polycarbonate and inside diameter of 7 to 8 inch. Furnish all stainless steel closure bolts, lens tie rods, and attachment hardware for a complete and accepted installation.

Furnish and install pier/fender lights, center channel lights and channel margin lights with cast aluminum or bronze swivel assembly and mounting bracket, complete with stainless steel pivot, watertight "O" ring seal, bronze bearings, cable entrance fitting, and stainless steel service chain rated for a minimum 225 pounds load. Use a 1-1/2 or 2 inch galvanized pipe or stainless steel pipe as a hanger stem with automatic lock at service and operating positions. Furnish and install a 60% counterweight if stem exceeds 5 feet in length. Ensure the pier/fender Light is equipped with a red 180 degree lens, the center channel light is equipped with a green 360 degree lens and the channel margin light is equipped with a red 180 degree lens.

510-4.2 Clearance Gauge Lights: Furnish and install one-piece die-cast aluminum fixture housing fitted with watertight gasket, stainless steel hinges and fasteners, and adjustable aiming capability, equipped with a 120 VAC 50 watt, high-pressure sodium lamp. Use a heavy cast aluminum connection box body and cover with stainless steel swing bolts, watertight gasket and provisions for mounting to a platform with four stainless steel lag bolts or screws.

510-5 Disconnect Switches.

Furnish and install switches that are HP rated and meet Federal and NEMA Specifications with NEMA Type 4X (stainless steel) enclosures, and with metal factory nameplates that are front cover mounted and contain a permanent record of switch type, catalog number, and HP rating. Provide switch with visible blades, reinforced fuse clips, and nontearable, positive, quick make-quick break mechanisms. Provide switch assembly plus operating handle as an integral part of the enclosure base.

Use switches with defeat able door interlocks that prevent the door from opening when the operating handle is in the ON position, and whose handle position is easily recognizable and is padlockable in the OFF position. Use heavy-duty switches with line terminal shields.

510-5.1 Fusible Switch Assemblies: Furnish and install NEMA KS 1 type; load interrupter enclosed knife switch. Provide fuse Clips that are designed to accommodate Class R fuses.

510-5.2 Non-fusible Switch Assemblies: Furnish and install NEMA KS 1; HD type, load interrupter enclosed knife switch.

510-5.3 Enclosures: Furnish and install NEMA KS 1 type enclosure as shown in the Contract Documents.

510-5.4 Installation: Install disconnect switches where indicated in the Contract Document or where required by the Engineer. Use separate conduits for line and load conductors. Install fuses in fusible disconnect switches.

510-6 Supporting and Mounting Devices.

Ensure the sizes, and types of anchors, fasteners and supports used are adequate to carry the load of the equipment and conduit, including the wire in the conduit.

Space conduit supports to avoid conflicts with reinforcing steel at 5 feet maximum. For concrete mounting, use anchor bolts and all matching parts and tools recommended by and provided by the same manufacturer, as well as suitable for dynamic loading caused by vibration due to traffic. To mount conduit supports and pull boxes, use 1/4 inch diameter anchor system. To mount channel lights use minimum 1/2 inch diameter anchor system with 3-1/2 inch embedment and 8 inch edge distance.

Use ASTM 300 series stainless steel conduit straps or hangers held at not less than two points.

Do not use powder-actuated anchors. Do not drill or weld structural steel members. Do not use bolts smaller than 1/4 inch in diameter except as may be necessary to fit the mounting holes in small and light devices. Install surface-mounted boxes with minimum of three anchors.

510-7 Conduit.

510-7.1 General: Furnish and install conduit in the quantities and sizes required to complete the work as shown in the Plans and as required by NEC. Use products listed and classified by UL as suitable for purpose specified and shown. Do not use non-metallic flexible conduit, aluminum, or electrical metallic tubing (EMT).

510-7.2 Liquid-Tight Flexible Metal Conduit: Furnish and install, liquid-tight flexible metal conduit of interlocked steel construction with PVC jacket, and fittings meeting the requirements of ANSI/NEMA FB 1.

510-7.3 PVC Conduit: Furnish and install, schedule 80 PVC 3/4 inch minimum diameter conduit meeting the requirements of ASTM D1785 and NEMA TC 2 and fittings and conduit bodies meeting the requirements of ASTM D2467 and NEMA TC 3.

510-7.4 Fiberglass Reinforced Epoxy Conduit: Furnish and install rigid non-metallic

fiberglass reinforced epoxy conduit and fittings manufactured in accordance with the applicable standards of ANSI and NEMA TC-14B.

Ensure the conduit has a bell and spigot type coupling and the coupling seal is made rigid by using an adhesive that will provide a water and vapor tight joint with a tensile strength equal to that listed for the conduit. An alternative type assembly may be used by applying a triple seal ribbed gasket of water resistant rubber material. Ensure the gasket is held firmly in place with a compatible adhesive.

Ensure that all fittings, adapters, and bends are manufactured from the same materials as the conduit and conform to the dimensional requirements of NEMA TC-14.

Use only fiberglass reinforced epoxy conduit and fittings made by the same manufacturer to insure proper fit and assembly, listed on the UL approved list and labeled for Type I service sizes 2 to 6 inches.

Ensure that each piece of conduit and fitting is clearly marked with durable contrasting ink, stenciled with the following:

1. Nominal size,
2. Bends to show the degree and radius of curvature,
3. Type: SW or HW,
4. Manufacturers' name or trademark.

510-7.5 Installation: Install conduit in accordance with National Electrical Contractors Association (NECA) "Standard of Installation" and manufacturer's instructions.

Arrange supports to prevent misalignment during wiring installation. Support conduit using straps, lay-in adjustable hangers, clevis hangers, and split hangers. Do not support conduit with wire or perforated pipe straps, plastic straps, or plastic hangers. Ensure that all wire used for temporary supports is removed upon completion of installation.

Install an expansion fitting for specified PVC conduit at all structure expansion joints or where movement between adjacent sections of conduit is expected. Submit certification to the Engineer from the manufacture that the expansion fitting meets the following minimum requirements: compatibility with the connected conduits, water proof, UV protected, and allows longitudinal movement equal to that of the expansion joint or movement expected.

Route exposed conduit parallel and perpendicular to walls or route conduit in the railings. Install conduits to be continuous and watertight between boxes or equipment. Protect conduits at all times from the entrance of water and other foreign matter by being capped or well plugged overnight and when the work is temporarily suspended.

Cut conduit square using saw or pipe cutter; de-burr cut ends. Bring conduit to shoulder of fittings; fasten securely. Use conduit hubs to fasten conduit to metal boxes. Do not install more than the equivalent of three 90 degree bends (total 270 degrees) between boxes. Use conduit bodies to make sharp changes in direction such as around diaphragms.

Join PVC conduit using cement recommended by manufacturer. Wipe PVC conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for a minimum of 20 minutes before pulling conductors.

Do not use flexible conduit extensions greater than 24 inches in length. Ensure that all flexible conduit extensions are equipped with bonding jumpers.

Do not allow moisture traps; provide pull box with drain fitting at low points in exposed conduit system.

510-8 Wiring.

510-8.1 General: Do not use aluminum conductors. Use only SE or RHW on incoming service and use single conductor with XHHW insulation, unless otherwise noted in the Plans. Do not use wire smaller than No. 12 AWG.

Furnish insulated conductors of seven or nineteen strand copper with a minimum 98% conductivity and connector accessories for copper in sufficient quantities for a complete installation.

510-8.2 Installation: Use pull boxes wherever necessary to facilitate the installation of the conductors. Do not use condulets for pulling more than ten conductors or for branching conductors.

Splice only in accessible boxes. Make lug connections with high pressure indent connector tools as recommended by the lug manufacturer. Make splices and taps to carry full ampacity of conductors without perceptible temperature rise. Tighten all connections to manufacturer's recommendations. Tape uninsulated conductors and connectors with electrical tape to 150% of the insulation value of conductor. Ensure all splices are waterproof. Use solderless pressure connectors with insulating covers for No. 8 AWG and smaller wire splices and taps. Use split bolt connectors for No. 6 AWG and larger wire splices and taps.

Pull all conductors into a raceway at the same time. Use soap base wire pulling lubricant for pulling No. 4 AWG and larger wire.

510-8.3 Testing: Test each circuit for continuity and short-circuits for its complete length before being connected to its load.

Inspect wire and cable for physical damage and proper connection.

510-8 Method of Measurement.

The quantity to be paid for will be at the Contract lump sum price, completed and accepted.

510-9 Basis of Payment.

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

Payment will be made under:

Item No. 510- 1- Navigation Lights - lump sum.

**SECTION 515
METAL PEDESTRIAN/BICYCLE RAILINGS, GUIDERAILS, AND HANDRAILS**

515-1 Description.

Furnish and install metal pedestrian/bicycle railings, including bullet rails, guiderails and handrails in accordance with the Plans and Design Standards.

Obtain rail components from producers currently on the Department's list of Producers with Accepted Quality Control Programs. Producers seeking inclusion on the list shall meet the requirements of Section 105.

515-2 Materials.

Meet the following requirements:

Concrete	Section 346
Anchor Bolts, Rods, Nuts and Washers*	Section 962
Adhesive Anchors**	Section 937
Aluminum	Section 965
Bearing Pads	932-2.5
Epoxy Mortar**	Section 926
Steel.....	Section 962

*Do not use expansion anchors.

**Use products listed on the Department's Approved Product List (APL).

515-3 Construction Requirements.

515-3.1 General: Space posts to clear obstacles without exceeding maximum post spacing and maintain a uniform spacing with reasonable consistency. Place splices in approximately the same place within a railing section.

Railings must be free of burrs and sharp edges and all plug welds ground smooth.

515-3.2 Welds: Nondestructive testing of welds is not required, unless otherwise shown in the Plans.

515-3.2.1 Aluminum Railing: Welds must be in accordance with Section 965.

Filler material for seal welds, plug welds and bend splices may be ER4303.

515-3.2.2 Steel Railing: Meet the requirements of Section 962, except weld connections must be in accordance with AWS D1.1, Structural Welding Code, using E70XX weld material, unless otherwise shown in the Plans.

515-3.3 Coatings:

515-3.3.1 Aluminum Railing: Coating is not required, unless otherwise shown in the Plans. Finished product must have a smooth uniform appearance.

When a colored coating is required, use a fluoropolymer based powder coating system complying with American Architectural Manufacturers Association (AAMA) Specification No. 2605.

515-3.3.2 Steel Railing: Components must be hot-dip galvanized after fabrication in accordance with Section 962, unless otherwise shown in the Plans. When a colored coating is required, meet the requirements of 649-4.

515-4 Shop Drawings.

Submit shop drawings and obtain approval prior to fabrication in accordance with Section 5. Show project specific geometry (line and grade), post type and locations, expansion joint and splice locations.

Include other project specific details such as tapered end transitions, continuity or transition details post and panel infill type, and anchor bolt general details.

515-5 Installation.

515-5.1 General: Place a 1/8 inch thick bearing pad with dimensions matching the base plate between the base plate and concrete surface.

515-5.2 Bullet Railings: Install rail posts normal to the profile grade longitudinally and

vertical transversely.

515-5.3 Pedestrian /Bicycle Railings and Guiderails: Install posts plumb. Use aluminum shim plates to make necessary adjustments. Bond stacked shim plates with adhesive bonding material and field trim shim plates to match the foundation contours. Beveled shim plates may be used in lieu of trimmed flat shim plates.

If shims greater than 1/2 inch total thickness are required, provide longer anchor bolts. Bolts must be long enough to secure washers and nuts and meet the minimum embedment length.

Post tolerance from plumb is plus or minus one inch, measured at 42 inches above the foundation. Rails must form a smooth continuous line without hills or dips greater than 1/2 inch between any three posts or side sway greater than 1/2 inch between post assemblies.

515-5.4 Anchoring:

515-5.4.1 General: Secure nuts to a snug tight condition. Use self-locking hex nuts or tack weld the top of each hex nut to the bolt to prevent loosening. For nuts that are not tack welded, distort bolt stems or threads to prevent nut removal. Coat damaged galvanizing on stems and tack welds in accordance with Section 562.

515-5.4.2 Adhesive Anchors: Install anchors in accordance with Section 416.

515-5.4.3 C-I-P and Thru-Bolt Anchors: Use galvanized hex head anchor bolts.

When thru-bolting is used, coat cut reinforcing steel inside the drilled hole with a zinc galvanizing compound in accordance with Section 562 prior to installing bolts.

515-5.4.4 Embedded Guiderail Posts: Core holes into the foundation concrete, then clean holes, in accordance with the manufacturer's instructions. At a minimum, use oil free compressed air to remove loose particles, brush the inside surface to free loose particles, then use compressed air again to remove any remaining particles.

Use a Type A, B, or F epoxy mortar to secure guiderail posts into the cored holes.

515-6 Method of Measurement.

The quantity of railing to be paid for will be the plan quantity, in linear feet, installed and accepted. The quantity will be measured along the centerline of the top rail.

515-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all materials, hardware, labor, and incidentals required to complete the installation. For relocation of existing railing, price and payment will be full compensation for the removal and reinstallation, including all materials, hardware, labor, and incidentals required to complete the installation.

Payment will be made under the following:

Item No. 515- 1 Pipe Handrail-Guiderail - per linear foot.

Item No. 515- 2 Pedestrian/Bicycle Railing - per linear foot.

Item No. 515- 3 Handrail - Retrofit to Existing Railing - per linear foot.

Item No. 515- 4 Aluminum Bullet Railings - per linear foot.

SECTION 560

COATING NEW STRUCTURAL STEEL

560-1 Description

Coat new structural steel in accordance with the requirements of this Section. Apply the coating system designated in the Contract Documents.

560-2 Materials.

560-2.1 Coating System: Use only coating products and systems meeting the requirements of Section 975 and listed on the Department's Approved Product List (APL). Use Type M coal tar epoxy coatings meeting the requirements of Section 926 and listed on the Department's APL 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. As an alternative, electronic conductivity meters approved for use by the Engineer may be used.

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.

Submit certification to the Engineer that the abrasives used meet the requirements of this Section and do not contain any chlorides and other salts.

For non-metallic abrasives, verify compliance with the conductivity and cleanliness requirements of SSPC-AB1. 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 (QC).

560-5.1 Shop Preparation and Application: Prior to applying coatings, submit 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: Submit a current Corporate QC Plan approved by SSPC under the SSPC-QP1 and/or SSPC-QP2 certifications as appropriate and a site specific Coating Plan to the Engineer at least 14 calendar days prior to beginning coatings work. Do not begin coatings work until the site specific Coating 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. Submit 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: Submit 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: Submit 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 (QC) Inspectors in the Shop and Field: All personnel performing coating QC activities must be employed by the coating contractor. Submit documentation to the Engineer that all personnel performing QC 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 QC 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 SSPCSP 1.

560-7.4 Washing: Clean all steel surfaces in accordance with the requirements of SSPCSP 12 LPWC WJ4.

560-7.5 Soluble Salts Detection and Removal: When using SSPC Guide 15, Class A retrieval methods, 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. Ensure the non-visible surface contaminant concentrations on blast-cleaned surfaces do not exceed 7 g/gm² for chlorides, 10 g/cm² for soluble ferrous iron, 17 g/m² for sulfates and 10 µg/cm² for nitrates. When using electronic conductivity meters, use meters meeting the requirements of 560-2.4 and measure the surface conductivity as prescribed by the manufacturer. The instrument shall be properly calibrated and maintained according to the manufacturer's recommendations. Ensure the surface conductivity does not exceed 70 micro-Siemens per centimeter squared. For either contaminant assessment method (salt test kits or conductivity meter) test three random locations in the first 1000 square feet and one random location for each subsequent 1000 square feet. When quality control documentation at a fixed location indicates 36 months of historical sequential soluble salt/conductivity levels below those specified above, soluble salt/conductivity testing frequency may be reduced to one test per day. When any concentration or conductivity measurement exceeds the levels given above, rewash the entire surface area and retest all potentially contaminated steel to the satisfaction of the Engineer. 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 "nearwhite" 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 in accordance with ASTM D4417, Method B or 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 15, 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 FED-STD-595, 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: Apply caulk after the intermediate coat has cured to a condition suitable for recoating in accordance with the manufacturer's product data sheet, and before application of the finish coat. Completely seal the perimeter of all 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 curing schedule prior to the application of the finish coat. It is unnecessary to caulk the perimeter of bolted friction splice plates unless otherwise directed by the Engineer. In addition, it is unnecessary to caulk cracks or crevices less than 0.003 inches in width located on the interior surface area of box girders.

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: Use an aluminum epoxy mastic that is at least 80% solids by volume. Apply a stripe coat after the prime coat, but prior to applying the intermediate coat. Also, apply a stripe coat after the intermediate coat but prior to the finish coat. Apply the stripe coat per the manufacturers published product data sheet but no less than 3 mils dry film thickness. Apply both stripe coats to achieve complete coverage on welds, corners, crevices, sharp edges, bolts, nuts, rivets, and rough or pitted surfaces. A stripe coat of translucent coatings is not required. Do not apply subsequent coats until the previous stripe coat has cured per the manufacturer's product data sheet for recoating. Stripe coating is not required for the inside surface area of all steel box girders.

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. As an exception to SSPC-PA2, the DFT of the prime coat shall not be less than the minimum specified by the manufacturer's product data sheet. 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 D4752 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 D4752, ASTM D5402, 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 Coating of Permanent Sheet, Pipe 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 primer to all surfaces of H and sheet piles and the exterior surface of pipe piles. Unless otherwise shown in the Contract Documents, apply coal tar-epoxy coatings to the exposed side of sheet 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 primer 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.
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 square feet of area unless deficient thickness is found. In this case, the rate of submeasurements 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.

SECTION 561

COATING EXISTING STRUCTURAL STEEL

561-1 Description.

Coat existing structural steel in accordance with the requirements of this Section by removing and replacing the existing coating or overcoating the existing coating as stated in the Contract Documents.

561-2 Materials.

561-2.1 Coating Systems: For removal and replacement systems, use coating products and systems meeting the requirements of Section 975 and are listed on the Department's Approved Product List (APL).

For overcoating systems, use products and systems as designated in the Contract Documents. Submit product data sheets and product Material Safety Data Sheets (SDS), or in lieu of SDS, submit test reports showing percent weight compositional analysis, Chemical Abstract Number, American Conference of Governmental Industrial Hygienists (ACGIH) time weighted average and ceiling exposure limits for all components, and 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.

561-2.2 Thinners, Solvents and Cleaners: Meet the requirements of 560-2.2. In addition, for overcoating systems, use thinners, solvents, and cleaners that do not damage the existing coating system.

561-2.3 Caulking: Meet the requirements of 560-2.3.

561-2.4 Soluble Salts Test Kit: Meet the requirements of 560-2.4.

561-2.5 Abrasives: Meet the requirements of 560-2.5.

561-2.6 Rust Preventative Compound: Meet the requirements of 560-2.6.

561-2.7 Storage: Meet the requirements of 560-2.7.

561-3 Equipment.

561-3.1 Compressed Air: Meet the requirements of 560-3.1.

561-3.2 Abrasive Blasting System: Meet the requirements of 560-3.2.

561-3.3 Coating Application System: Meet the requirements of 560-3.3.

561-4 Quality Control (QC).

561-4.1 Field Preparation and Application: Submit a current Corporate Q C Plan approved by SSPC under the SSPC QP1 and SSPC QP2 certifications as appropriate and a site specific Coating Plan to the Engineer at least 14 calendar days prior to beginning coatings work. Do not begin coatings work until the site specific Coating Plan has been approved by the Engineer.

Prepare a traffic control plan for each phase of construction activities signed and sealed by the Contractor's Engineer of Record in accordance with the Roadway Plans Preparation Manual. Do not begin work until the traffic control plan is approved by the Engineer. Maintain traffic in accordance with Section 102.

For work over navigable waters, submit a work plan to the United States Coast Guard including any scheduled restrictions to navigation channels or marine traffic. Obtain Coast Guard approval at least 30 days in advance of any restrictions.

561-4.2 Inspection: Meet the requirements of 560-5.3.

561-5 Qualifications.

561-5.1 Field Contractor: Meet the requirements of 560-6.2.

561-5.2 Quality Control (QC) Inspectors: Meet the requirements of 560-6.3.

561-5.3 Certifications: Meet the requirements of 560-6.4.

561-6 Surface Preparation.

561-6.1 General: When portions of the existing coating are designated in the Contract Documents to be removed and replaced, clean, wash, test and remove soluble salts, and abrasive

blast or hand and power tool clean to remove all existing coating and corrosion in the intended locations. Feather back the edges of all existing coating to remain a minimum of 3 inches around the area of existing coating removed to provide a smooth transition. Verify the edges of the existing coating are intact by probing with a dull putty knife in accordance with SSPC SP 2. Roughen the existing coating in the feathered area to ensure proper adhesion of the new coating. Notify the Engineer immediately when any structural steel appears to be defective. When the existing coating is to remain, clean, wash, and test and remove soluble salts.

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. 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 50F above the dew point temperature.

561-6.2 Mechanical Removal of Surface Defects: Meet the requirements of 560-7.2. In addition, remove all pack rust prior to solvent cleaning.

561-6.3 Cleaning: Meet the requirements of 560-7.3.

561-6.4 Washing: Meet the requirements of 560-7.4.

561-6.5 Soluble Salts Detection and Removal: Meet the requirements of 560-7.5 except test five random locations in the first 1000 square feet and one random location for each subsequent 1000 square feet.

561-6.6 Abrasive Blast Cleaning: Meet the requirements of 560-7.6.

561-6.7 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 as stated in the Contract Documents. Use SSPC VIS 3 as an aid in establishing cleanliness.

561-7 Surfaces Not to be Coated.

561-7.1 Galvanized Surfaces: Meet the requirements of 560-8.1.

561-7.2 Machine Finished Surfaces: Meet the requirements of 560-8.4.

561-8 Application.

561-8.1 General: Apply a complete coating system to all structural steel surfaces except surfaces indicated in 561-7.

Prior to the application of any coating, inspect the substrate for contamination and defects, and prepare the surface in accordance with 561-6 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 FED-STD-595, Shade 36622, unless otherwise specified in the Contract Documents.

561-8.2 Weather and Temperature Limitations: Meet the requirements of 560-9.2.

561-8.3 Sealing Using Caulk: Meet the requirements of 560-9.3.

561-8.4 Protection of Adjacent Surfaces: Meet the requirements of 560-9.4.

561-8.5 Mixing and Thinning: Meet the requirements of 560-9.5.

561-8.6 Application Methods: Meet the requirements of 560-9.6.

561-8.7 Stripe Coating: Meet the requirements of 560-9.7.

561-8.8 Thickness of Coats: Meet the requirements of 560-9.8.

561-8.9 Coating Drying, and Curing: Apply coatings within the time specified by the coating manufacturer's product data sheet for drying and recoating. Before handling, test for cure in accordance with the manufacturer's recommended method. Meet the requirements of 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.

561-8.10 Coating Finish: Meet the requirements of 560-9.10.

561-9 Touchup and Repair.

Clean and coat all welds, rivets, bolts, and all damaged or defective coating and rusted areas in accordance with 561-6 and 561-8. 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.

561-10 Protection of the Environment, Public, and Workers.

561-10.1 General: Establish plans and programs to protect the environment, public, contractor employees, other workers, and property from overspray, exposure to toxic heavy metals and the release and emission of hazardous materials and nuisance dusts. Include in such plans and programs a procedure for the receipt, processing, evaluation and timely written response for claims by the public for damage resulting from the foregoing work. Submit to the Department any written response which denies such damage claims. Conduct all coating application and removal operations in compliance with EPA, OSHA, and other applicable Federal, State and local regulations. Submit a contingency plan for the remediation of water and land in the event of contamination by solid or liquid paint and contaminated water.

561-10.2 Environmental Protection: Prepare and submit to the Engineer, plans and programs for the protection of the environment and public based on the applicable EPA requirements, the requirements of this Section, and the Contract Documents. Include plans and programs for the protection of the air, soil/ground, and water.

561-10.2.1 Pollution Control: Submit a written pollution control and monitoring plan at the preconstruction meeting or as directed by the Engineer which clearly describes the means for complying with all Local, State and Federal regulations including pollution control provisions specified herein. The written plan must be in accordance with SSPC Project Design: Industrial Lead Paint Removal Handbook, Volume II, Phase 6, Environmental Monitoring, and specifically include, but not be limited to, providing a scaled map of the work site layout showing the proposed number and location of soil sampling, Total Suspended Particulate (TSP) monitoring sites, waste storage areas, staging areas, temporary waste storage areas, and ambient air and personnel sampling frequency.

Comply with all applicable Federal, State, and Local rules and regulations.

Immediately cease all operations in the event a violation of any environmental regulation or a failure to properly execute any pollution control provisions occurs. Resume operations after written proposed corrective procedures have been submitted to and approved by the Engineer and implemented.

561-10.2.2 Permits: Submit all required permits from all applicable regulatory agencies to the Engineer prior to the commencement of any work. Seek permit determination from these regulatory agencies to avoid any potential permit non-compliance issues during work activities. The Contractor is responsible for all liability resulting from non-compliance with pertinent rules and regulations including permit requirements.

561-10.2.3 Ambient Air Quality Compliance and Protection of the Air:

561-10.2.3.1 Visible Emissions: Assess the visible emissions using EPA Method 22, Timing of Emissions as defined by 40 CFR 60, Appendix A, Standards of Performance for New Stationary Sources. During abrasive blasting, do not allow visible emissions from a containment to exceed a random cumulative duration of more than one percent of the workday (SSPC Guide 6, Level 1 Emissions). During pressurized water cleaning, do not allow visible emissions from a containment to exceed a random cumulative duration of more than ten percent of the workday (SSPC Guide 6, Level 3 Emissions).

561-10.2.3.2 Total Suspended Particulate (TSP) Matter: Control emissions from the containment area to prevent exceeding the TSP lead of 1.5 $\mu\text{g}/\text{m}^3$ over a 90 day period, or the daily and adjusted daily allowances of SSPC-TU 7. Conduct TSP Lead

monitoring in accordance with 40 CFR 50, Appendix B, Reference Method for Determination of TSP Matter in the Atmosphere (high volume sampler required), and 40 CFR 50, Appendix G, Reference Method for Determination of TSP Matter Collected from Ambient Air. Position the TSP lead monitoring equipment in general accordance with 40 CFR 58, Ambient Air Quality Surveillance.

When lead is present in the coating, perform TSP Lead background monitoring for a period of 3 days prior to the beginning of abrasive blast cleaning operations. Submit the results from background monitoring and the first week of monitoring during abrasive blast cleaning to the Engineer for review within 5 calendar days after the first week of work. Continue monitoring unless otherwise directed by the Engineer.

561-10.2.3.3 Regulated Area: Establish a regulated area around the work site to prohibit unauthorized persons from areas where exposure to hazardous airborne metals may exceed the following action levels:

Airborne Metals Action Level

Lead 30 $\mu\text{g}/\text{m}^3$

Cadmium 2.5 $\mu\text{g}/\text{m}^3$

Arsenic 5 $\mu\text{g}/\text{m}^3$

Hexavalent Chromium (Cr6+) 2.5 $\mu\text{g}/\text{m}^3$

Conduct monitoring in accordance with the National Institute for Occupational Safety and Health (NIOSH) procedures upon initiation of dust producing operations and submit the test results to the Engineer within 72 hours of sampling. Report sample results as eight-hour Time Weighted Averages (TWA). Reestablish the regulated area and perform additional sampling when the results exceed the action levels or when directed by the Engineer. Record all pertinent data. Position air-sampling pumps around the project perimeter where the public or personnel can approach the work area. Place sampler inlets at breathing height. Clearly mark the regulated area by the use of warning signs, rope, barrier tape, or temporary construction fencing.

561-10.2.4 Soil/Ground Quality: Inspect the ground beneath and in proximity to the structure in the presence of the Engineer for visible paint chips to establish an initial job site cleanliness standard. When heavy metals are in the existing coatings, test soil samples prior to the beginning of operations and after project completion for heavy metals. Document the number and specific locations where the initial samples are taken as outlined in the SSPC Project Design-Industrial Lead Paint Removal Handbook, Volume 2 to ensure the post samples are collected from the same locations. Submit all samples to the Engineer for review. If the project activities increase the heavy metal content in soil to more than 20% above the pre-job geometric mean or 100% at any one location, return the site to the pre-job levels. Conduct additional soil testing as necessary to determine the extent of contamination.

For structures less than 14 feet minimum height, take one sample north, south, east, and west (where soil is present) of the structure. If the structure is longer than 14 feet, take one additional sample for every 14 feet in length.

For structures greater than 14 feet minimum height, take two samples north, south, east, and west (where soil is present) of the structure. Locate the inner row of samples within 14 feet of the structure. Locate the outer row of samples at a distance equal to the height of the structure. If the structure is longer than 14 feet, take one additional sample for every 14 feet in length.

In addition, submit a pre- and post- soil sampling plan for storage areas identifying the sample location, depth, analyses list, lab certification, and turnaround time. Once approved by the Engineer, submit sampling results along with a scaled drawing indicating designated sample locations.

561-10.2.5 Water Quality: Do not release, discharge or otherwise cause hazardous materials, debris, waste, or paint chips to enter the water. Protect against releases due

to rain and methods of surface preparation from reaching rivers, streams, lakes, storm drains, or other bodies of water.

561-10.3 Containment System: Submit a written containment system design plan in accordance with this section and the contract documents at the pre-construction conference or as directed by the Engineer which clearly describes the proposed containment system applicable to the intended removal method and in accordance with the requirements outlined herein and SSPC Guide 6, Guide for Containing Debris Generated During Paint Removal Activities. Ensure the plan includes, but is not limited to, removal method; methods for collecting debris; and containment enclosure components. Use fire retardant materials. Submit containment drawings, calculations, assumptions, ventilation criteria if applicable, and a structural analysis that verifies the existing structure can withstand the additional dead, live and wind loads imposed by the containment system, signed and sealed by a Specialty Engineer. However, for more complex structures incorporating cables stayed, suspension, or truss designs, the analysis must be performed by the Contractor's Engineer of Record qualified in Type Work Category 4.3, Complex Bridge Design. Submit a contingency plan addressing natural weather events such as tropical storms and hurricanes. Ensure the lighting inside the containment is in accordance with SSPC Guide 12, Guide for Illumination of Industrial Painting Projects. Provide lighting to a minimum intensity of 10 ft-cd for general, 20 ft-cd for work, and 50 ft-cd for inspection. All drawings and calculations must be submitted and accepted before any work begins. Include a clear description of the ventilation system components and information including the fan curve and design point on the proposed dust collector. Design to provide ventilation according to the notes provided in SSPC Guide 6: 100 feet per minute for cross draft and 50-60 feet per minute for downdraft.

Isolate the immediate area of the structure to ensure compliance with current and permit requirements for air, water, soil, and pollution prevention. Protect the containment system from vehicular and pedestrian traffic. Ensure paint, paint chips, or other debris will not fall outside of the containment area under any circumstances. Repair any damage created by fastening, bracing, or handling the scaffolding and staging. If a suspended platform is constructed, use rigid or flexible materials as needed to create an air and dust impenetrable enclosure. Verify that the platform and its components are designed and constructed to support at least four times its maximum intended load without failure, with wire cables capable of supporting at least six times their maximum intended load without failure. Strictly comply with all applicable OSHA regulations regarding scaffolding. The category and class of containment shall be as required in the Contract Documents.

561-10.4 Protection of Adjacent Areas: Protect all areas adjacent to abrasive blast cleaning, including machinery and deck grating. Before the commencement of any cleaning and coating operations, submit a control plan for the protection of adjacent surfaces from damage by nearby blasting and coating to the Engineer for review. Repair any damage to adjacent areas. The repair procedure must be submitted to the Engineer for acceptance prior to any remediation.

561-10.5 Worker Protection: Comply with the requirements of OSHA 29 CFR 1926 and applicable portions of 29 CFR 1910. Include specific programs as required by 29 CFR 1926.62 (lead), 29 CFR 1926.1118 (inorganic arsenic), 29 CFR 1926.1126 (hexavalent chromium), and 29 CFR 1926.1127 (cadmium) when these hazardous agents are present. Implement appropriate safety procedures for all hazards on the job site whether specifically identified herein or not.

561-11 Waste Handling and Management.

561-11.1 General: Prepare a waste management program plan which addresses the applicable requirements from EPA regulations for hazardous waste management and the Contract Documents. Include provisions for the handling and disposal of non hazardous waste. Dispose of all waste in accordance with all federal, state, and local laws and regulations.

561-11.2 Collection and Handling of Waste: Properly classify, package, and store all

paint removal debris, both solid and liquid in accordance with SSPC Guide 7, Guide for the Disposal of Lead-Contaminated Surface Preparation Debris, the Federal Water Pollution Control Act with amendments, and all other current government regulations and guidelines. Comply with the Resource Conservation and Recovery Act to include, at a minimum, CFR 40 260 through CFR 40 268. Prior to identification and storage, separate solid and liquid waste, and separate individual waste streams.

561-11.3 Testing and Analysis: Laboratory analyses for all waste stream and environmental samples shall be conducted by an EPA certified, independent laboratory with an approved Quality Assurance Plan. Laboratory analyses for worker monitoring and regulated area samples shall be conducted by an American Industrial Hygiene Association (AIHA) metals accredited laboratory. Submit all sampling and test reports no later than 72 hours after collection of samples.

561-11.4 Waste Identification: Collect samples in accordance with EPA SW 846, Test Methods for Evaluating Solid Waste - Physical/Chemical Methods. Use a random and representative sampling technique. Collect a minimum of four representative samples of each waste stream. These waste streams include, but are not limited to, water, paint chips, dust, and paint chips mixed with disposable abrasives and debris. Complete the initial sampling of each waste stream immediately upon filling the first drum, but do not allow waste to accumulate for longer than 7 days before sampling.

After the representative samples are collected, send them immediately to the EPA certified laboratory for analysis. Unless otherwise directed by the Engineer, required by State regulations, or required by the waste recycling or disposal facility, once each waste stream is sampled, tested, and classified, additional sampling and analysis are not required for subsequent shipments unless the waste stream changes. Submit samples to an approved laboratory to be tested for arsenic, barium, cadmium, hexavalent chromium, lead, mercury, selenium, and silver in accordance with EPA Method 3050 and Method 6010 (content) and EPA Method 1311, Toxicity Characteristics Leaching Procedures (TCLP). Clearly label each sample with sample number, date and time of sampling, name of collector, and location of collection.

Maintain chain of custody forms for each sample. Enter each sample on a sample analysis request form. Record sample numbers, type of waste, amount of each sample, distribution of samples, signature and all other information.

561-11.5 Waste Storage: Collect waste from the control devices, equipment, and all work surfaces on a daily basis. Keep hazardous and non-hazardous waste separate. Do not mix blasting debris with any other type of waste. Place waste in approved storage drums. Locate all hazardous waste within a regulated area. The maximum weight for each drum, when filled, is 821 pounds. Properly seal and label all drums. Transport waste storage drums to a secured, marked, temporary storage area. Locate the temporary storage area on well-drained ground not susceptible to flooding or storm water run-off. Place drums on a pallet and cover with fiber reinforced, impermeable tarpaulins. Store drums no more than two drums wide and two drums high. Arrange drums so that labels are easily readable. Do not store waste in the temporary storage area longer than 90 days.

561-11.6 Waste Disposal: Transport, treat and dispose of all hazardous and nonhazardous waste. Notify the Engineer a minimum of three weeks prior to the date of shipment of any waste to an off-site facility. Submit to the Engineer documentation that the receiving disposal facilities are properly licensed. Submit manifests for all hazardous and non-hazardous waste shipments. Identify any waste disposal subcontractors and submit verification of their licensing to perform waste disposal and transport operations.

561-11.7 Permits: The Contractor is responsible for all liability resulting from noncompliance with pertinent rules and regulations including permit requirements.

561-12 Method of Measurement.

When a lump sum pay item is provided, the quantity to be paid for coating existing

structural steel will be the lump sum quantity for the areas shown in the Plans, completed and accepted.

When a square foot item is provided, the quantity to be paid for coating existing structural steel will be the plan quantity in square feet of surface area as shown in the Plans, completed and accepted.

561-13 Basis of Payment.

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

Payment will be made under:

Item No. 561- 1- Coating Existing Structural Steel - lump sum.

Item No. 561- 2- Coating Existing Structural Steel - square foot.

SECTION 563

ANTI-GRAFFITI COATINGS

563-1 Description.

Apply an anti-graffiti coating in accordance with the requirements of this Section to the areas shown in the Plans.

563-2 Materials.

Use anti-graffiti coating products meeting the requirements of Section 975 that are recommended for the base substrate by the manufacturer and listed on the Department's Approved Product List (APL). Do not use sacrificial coatings on steel structures.

563-3 Application.

563-3.1 General: Apply anti-graffiti coatings in accordance with the manufacturer's product data sheet.

563-3.2 Protection of Adjacent Surfaces: Consider wind direction, velocity and geographic location as having a major impact on all cleaning and anti-graffiti coating operations. Use all necessary precautions to prevent cleaning and anti-graffiti coating materials from being dispersed outside the work site. If conditions are such that material is dispersed to areas where vehicles or other property may be damaged, suspend operations until conditions improve and work can continue without affecting adjacent property.

Protect all surfaces not intended to be coated, which are adjacent to, or in close proximity to the surfaces to be coated, during the application of anti-graffiti coating. Clean surfaces that are to be coated, as per the manufacturer's product data sheet.

563-3.3 Surface Preparation: Remove all graffiti from the substrate. Prior to applying any anti-graffiti coatings, prepare all surfaces to be coated in accordance with ASTM D4261 or ASTM D4258 and the manufacturer's product data sheet.

When the anti-graffiti coating or coating system is to be applied over an existing coating, apply a test patch (minimum area of 4 square feet) in accordance with this Section. Allow the test patch to cure a minimum of 7 days without any defects. No time extension will be granted as a result of this test requirement.

563-3.4 Correction of Deficiencies: Remove all applied anti-graffiti coatings identified by the Engineer as damaged, defective, or otherwise not meeting these Specifications, in accordance with the manufacturer's recommendations.

Prepare the surface and reapply the coating in accordance with the manufacturer's recommendations and as specified herein.

Remove and correct all deficiencies at no additional cost to the Department.

563-4 Method of Measurement.

The quantity to be paid for will be plan quantity, in square feet, of the area of antigraffiti coating completed and accepted.

The area will be based on the surface area shown in the Plans with no allowance for surface texture or variable depth surface profiles.

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563-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including furnishing and applying all materials to complete the anti-graffiti coating. Payment shall be made under:

Item No. 563- 3- Anti-Graffiti Coating, Sacrificial - per square foot.

Item No. 563- 4- Anti-Graffiti Coating, Non Sacrificial - per square foot.

**SECTION 570
PERFORMANCE TURF**

570-1 Description.

Establish a growing, healthy turf over all areas designated in the Plans. Use sod in areas designated in 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 MaterialsSection 981
FertilizerSection 982
WaterSection 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.

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 789

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 moistureholding 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 nonvegetative erosion and sediment control methods.

Provide evidence of product performance testing, manufacturer's certification of training and material samples to the Engineer at least 7 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 moistureholding 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
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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:

1. An established root system (leaf blades break before seedlings or sod can be pulled from the soil by hand).
2. No bare spots larger than one square foot.
3. No continuous streaks running perpendicular to the face of the slope.
4. No bare areas comprising more than 1% of any given 1,000 square foot area.
5. No deformation of the turf areas caused by mowing or other Contractor equipment.
6. No exposed sod netting.
7. No pests or noxious weeds.

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, <http://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.

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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:

1. Determination that the deficiency was due to the failure of other features of the Contract.
2. 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 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 months or until the remedial action is satisfactorily performed, whichever is longer.

792

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.

Lee County
DEPARTMENT OF TRANSPORTATION
SPECIAL TECHNICAL SPECIFICATIONS
FOR
INTEGRAL PILE JACKETS

INTEGRAL PILE JACKETS.

(REV 6-20-08) (FA 6-26-08) (1-09)

PAGE 563. The following new Section is added after Section 455:

SECTION 457 INTEGRAL PILE JACKETS

457-1 Description.

Furnish, fabricate and install an integral pile jacket in accordance with the Contract Documents.

457-2 Materials.

457-2.1 Stay-In-Place Forms: Use forms composed of a durable, inert, corrosion resistant material with an interlocking joint along one or two sides that permits the form to be assembled and sealed in place around the pile. Fabricate the forms from fiberglass and polyester resins, having a minimum thickness of 1/8 inch. Ensure the form is capable of maintaining its original shape without additional support or damage when placed around a pile. Ensure the inside face of the form has no bond inhibiting agents in contact with the filler material. Provide the forms with bonded or bolted-on, non-corrosive standoffs to maintain the forms in the required positions. Sandblast or score the inside surface of the forms with an abrasive material to provide a rough surface texture. Equip the forms with a compressible sealing strip at the bottom which will effectively seal the annular space between the pile and the form. Use non-metallic hardware for pumping ports when these are provided. Fabricate the pile jacket form in a workmanlike manner and have it inspected and approved by the Engineer prior to placement on piles. Remove any pile jacket form not approved from the project.

The forms shall meet the following physical property requirements of Table 1:

Water Absorption (ASTM D 570)	1% maximum
Ultimate Tensile Strength (ASTM D 638)*	9,000 psi minimum
Flexural Strength (ASTM D 790)*	16,000 psi minimum
Modulus of Elasticity (ASTM D 790)	700,000 psi minimum
IZOD Impact (ASTM D 256)	15 lb/inch minimum (unnotched specimen)
Barcol Hardness (ASTM D 2583)	45 minimum
Color: Similar to Federal Color Standard No. 595, Table VIII, Shade No. 36622. The color must be integral in the form material.	
* On original specimens whose flat surfaces are not machined to disturb the fiberglass.	

457-2.2 Anode Material: For cathodic protection, use expanded mesh anodes pre-installed inside the form by the manufacturer. Use anode type and configuration shown in the Contract Documents. If galvanic anodes are used, place the nodes in direct contact with the inside face of the form.

457-2.3 Fillers: Use Portland cement grout fillers for non-structural jackets and concrete fillers for structural jackets.

457-2.3.1 Portland Cement Grout: Use a mix design of Portland cement, fine aggregate, water and an admixture containing a minimum of 940 pounds of cementitious material per cubic yard. Up to 30%, by weight of cement, may be replaced by fly ash for standard pile jackets. Do not use fly ash, slag, or silica fume for cathodic protection jackets.

Use Silica Sand fine aggregate meeting the requirements of Section 902.

Use Portland cement meeting the requirements of Section 921.

Use admixtures meeting the requirements of Section 924,

AASHTO M 194, Types A and D.

Use air-entraining admixtures meeting the requirements of Section 924 and containing no chlorides or other salts corrosive to metals.

Use fly ash meeting the requirements of Section 929, ASTM C 618, Type F, except that loss on ignition shall not exceed 4%.

Provide a grout filler mix with a minimum compressive strength of 5,000 psi at 28 days and a slump of 7 to 9 inches. Submit the design mix to the Engineer for approval before placing any grout filler.

457-2.3.2 Class IV Concrete: Use Class IV Concrete meeting the requirements of Section 346 with an adjusted slump of 7 to 9 inches. Reduced size coarse aggregate may be used as approved by the Engineer. Do not use fly ash, slag, or silica fume for cathodic protection jackets.

Submit the design mix to the Engineer for approval before placing any concrete filler.

457-2.3.3 Special: When required, furnish special fillers in accordance with the Contract Documents. Provide test results and documentation that demonstrate the material meets the requirements for the project. Use materials meeting the requirements of 930-7 when cementitious pre-bagged fillers are specified.

457-2.4 Water: Use water that meets the requirements of Section 923 for all filler mixing. Use potable water for cleaning, rinsing, or any other application that requires direct contact with the piles.

457-2.5 Reinforcing Steel: Use reinforcing steel meeting the requirements of Section 415 for all structural jackets.

457-2.6 Materials Certification and Testing.

457-2.6.1 Certification: For materials other than those for Portland cement grout and Class IV Concrete, provide a certificate to the Engineer certifying that the materials furnished meet all the requirements of this Section and conform in all respects to the materials tested. Attach copies of current test reports to the certificate.

Provide certified test results of the chemical composition of the anode and provide manufacturer certification stating that the dimensions and physical characteristics of the anode meet the requirements of the Contract Documents.

457-2.6.2 Testing: No test report for tests made more than one year prior to shipment will be accepted for the form material.

Test materials for Portland cement grout and Class IV concrete as required in Section 346 for approved design mixes. Perform sampling and testing using Quality Control technicians meeting the requirements of Section 105.

Test properties of materials for other cement based fillers allowed under 457-2.3.3 same as required for the FDOT approved design mixes. Test the materials at a frequency of one set of tests per load of the mixer. For each set of tests, cast three 4 inch by 8

inch cylinders for compressive strength testing at the required test date. The Engineer may adjust the frequency of testing based on consistency of the mixes. Conduct a field verification mix prior to commencing the jacket installation. Cure samples of cement based materials in accordance with ASTM C-31.

Hardened concrete or grout will be accepted on the basis of strength test results as defined in this Section. Test the laboratory cured samples for compressive strength at 28 days in a laboratory meeting and maintaining at all times the qualification requirements listed in 105-6.

457-3 Construction.

457-3.1 Shop Drawings: Submit shop drawings and obtain approval prior to field installation. Provide shop drawings showing locations of standoff spacers, method of fastening jacket form to piling, method of sealing the form after installation, and method for bracing during placement of filler. Include details of access holes, fiberglass caps, and methods for placing the filler and capping the pumping ports.

457-3.2 Surface Preparation: Remove all cracked or delaminated concrete and excavate to a depth of 3/4 to 1 inch behind the exposed reinforcement. Limit the size of chipping hammers to 20 pounds unless otherwise approved by the Engineer. Thoroughly clean all pile surfaces that the jackets will cover. Remove all oil, grease, dirt, broken concrete, marine growth and any other deleterious material that would prevent proper bonding. Sandblast all exposed reinforcing steel to SSPC-SP10, near white, per the Society of Protective Coatings, to remove all rust and scale before installing the pile jacket. Water blast or mechanically clean reinforcing steel exposed under water by methods and with equipment approved by the Engineer. Clean existing concrete surfaces by sandblasting, wet blasting, wire brushing, water laser, or other methods approved by the Engineer which will yield an equivalent result. Do not place the form until the surface preparation has been approved by the Engineer.

457-3.3 Cathodic Protection: Provide connection to the reinforcement for cathodic protection integral pile jackets inside the jacket limits unless otherwise specified in the Contract Documents. Use connection methods and materials in accordance with the Contract Documents.

457-3.4 Form Placement: Place the fiberglass form in position around the pile; secure and seal the interlocking joint(s), and seal the bottom of the form against the pile surface with the compressible seal and an approved epoxy adhesive meeting the requirements of Section 926. Adjust stand-offs as necessary to prevent misalignment and install temporary hard backing to prevent deformation.

457-3.5 Filler Placement: Wet to saturation the surface of the pile immediately prior to placing the filler. Place the filler in one continuous pour at no more than 72 hours after surface preparation. Fill the annulus between the pile and pile jacket form following the jacket manufacturer's instructions and the Contract Documents. Do not drop filler material into forms higher than five feet or into forms containing water. Prevent contamination of the filler during placement and provide internal or external vibration to ensure proper consolidation.

Cure filler for a minimum of 96 hours before removing any external bracing. Remove any filler or other extraneous material from the exterior surface of the form and clean the form without damaging the fiberglass or gel coat resin.

457-4 Method of Measurement.

The quantities to be paid for under this Section will be the total feet of Integral Pile Jacket furnished, installed, completed and accepted. Measure length from bottom of the form to top of the form.

457-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section. No separate payment will be made for reinforcing steel or filler material. Include payment for anode material and anode connection accessories in the price per foot for Cathodic Protection Integral Pile Jackets.

Payment will be made under:

- Item No. 457-1- Standard Integral Pile Jacket - per foot.
- Item No. 457-2- Cathodic Protection Integral Pile Jacket – per foot

TS-5.0 Articulated Concrete Block Mats

TS-5.1 The contractor will furnish all labor, materials, equipment, and incidentals required and perform all operations in connection with the installation of articulated concrete block mats in accordance with the lines, grades, design and dimensions shown on the Construction Drawings and as specified herein.

TS-5.2 The articulated concrete blocks cellular concrete blocks will have the following nominal characteristics:

Class: 45

Type: Closed

Block Weight: 72 – 78 Lbs

Block Size: 17.4 x 15.5 x 4.75

Open Area: 10

TS-5.3 The CONTRACTOR may submit an alternative material for consideration. Such materials must be pre-approved in writing by the ENGINEER prior to bid date. Alternative material packages must be submitted to the ENGINEER a minimum of fifteen (15) days prior to bid date. Submittal packages must include, as a minimum, the following:

1. Full-scale laboratory testing performed by the submitting manufacturer and associated engineered calculations quantifying the hydraulic capacity of the proposed cellular concrete mat system in similar conditions to the specific project.
2. A list of 5 comparable projects, in terms of size and applications, in the United States, where the results of the specific alternate revetment system use can be verified after a minimum of five (5) year of service life.

TS-5.4 The Contractor will submit to the ENGINEER all manufacturers' hydraulic testing and calculations in support of the proposed cellular concrete mat system and geotextile. The Contractor will furnish the manufacturer's certificates of compliance for cellular concrete blocks/mats, revetment cable, and any revetment cable fittings and connectors. The Contractor will also furnish the manufacturer's specifications, literature, shop drawings for the layout of the mats, and any recommendations, if applicable, that are specifically related to the project.

TS-5.5 All cellular concrete mats will be prefabricated as an assembly of concrete blocks, with specific hydraulic capacities, laced with revetment cables. Cellular concrete mats may be assembled on-site by hand-placing the individual units either with or without subsequent insertion of cables.

TS-5.6 Individual units in the system will be staggered and interlocked for enhanced stability. The mats will be constructed of open and/or closed cell units as shown on the contract drawings. Parallel strands of cable will extend through two (2) cable ducts in each block allowing for longitudinal binding of the units within a mat. Each row of units will be laterally offset by one-half of a block width from the adjacent row so that any given block is cabled to four other blocks (two in the row above and two in the row below).

TS-5.7 Each block will incorporate interlocking surfaces that minimize lateral displacement of the blocks within the mats when they are lifted by the longitudinal revetment cables. The interlocking surfaces must not protrude beyond the perimeter of the blocks to such an extent that they reduce the flexibility or articulation capability of the cellular mats or become damaged or broken when the mats are lifted during shipment or placement. Once the mats are in place, the interlocking surfaces will minimize the lateral displacement of the blocks even if the cables should become damaged or removed. The mats must be able to flex a minimum of 18° between any given row or column of blocks in the uplift direction and a minimum of 45° in the downward direction.

TS-5.8 All units will be sound and free of defects that would interfere with either the proper placement of the unit or impair the performance of the system. Surface cracks incidental to the usual methods of manufacture, or surface chipping resulting from customary methods of handling in shipment and delivery, will not be deemed grounds for rejection. Cracks exceeding 0.25 inches (.635 cm) in width and/or 1.0 inch (2.54 cm) in depth will be deemed grounds for rejection. Chipping resulting in a weight loss exceeding 10% of the average weight of a concrete unit will be deemed grounds for rejection. Blocks rejected prior to delivery from the point of manufacture will be replaced at the manufacturer's expense. Blocks rejected at the job site will be repaired with structural grout or replaced at the expense of the contractor.

TS-5.9 Mattress cable will be constructed of high tenacity, low elongating, and continuous filament polyester fibers. Cable will consist of a core construction comprised of parallel fibers contained within an outer jacket or cover. The weight of the parallel core will be between 65% to 70% of the total weight of the cable. The revetment cable will have the following physical properties:

Polyester Cable

Nominal Cable Dia: ¼ In

Approx. Ave. Strength: 3000 Lbs

Weight per Length: 2.2 Lbs/100Ft

Elongation requirements specified below are based upon stabilized new, dry cable. Stabilization refers to a process in which the cable is cycled fifty (50) times between a load corresponding to 200D₂ and a load equal to 10%, 20% or 30% of the cable's approximate average breaking strength. Relevant elongation values are as shown in the table below. The tolerance on these values is + 5%.

ELASTIC ELONGATION

at Percentage of Break Strength

10% 0.6

20% 1.4

30% 2.2

The materials used in the construction of the cable will not be affected by continuous immersion in fresh or salt water. Selection of cable and fittings will be made in a manner that insures a safe design factor for mats being lifted from both ends, thereby forming a catenary. Fittings such as sleeves and stops will be aluminum and washers will be galvanized steel.

TS-5.10 Cellular concrete blocks should be flush and develop intimate contact with the subgrade section, as approved by the ENGINEER. No individual block within the plane of placed cellular concrete blocks will protrude more than one-half inch or as otherwise approved by the ENGINEER.

Proposed hand placing only is to be used in areas immediately adjacent the piles and in between the pile clusters. Hand placement may also be acceptable in areas where construction equipment cannot access the area due to overhead constraints of the bridge and will be connected to the adjacent concrete blocks per manufacturer specifications.

If assembled and placed as large mattresses, the concrete block mats will be attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The equipment used should have adequate capacity to place the mats without bumping, dragging, tearing or otherwise damaging the underlying fabric. The mats will be placed side-by-side and/or end-to-end, so that the mats abut each other. Mat seams or openings between mats will be less than (2) inches.

TS-5.11 The concrete blocks, cables and fittings will be fabricated at the manufacturer or another approved location into mats with a width of up to eight (8) feet and a length up to forty (40) feet, which is approved by the ENGINEER. In order to properly install the concrete block mats it is expected various lengths and widths of mats will need to be constructed. The CONTRACTOR should additionally have onsite half block size both in the longitudinal and transverse direction in order to hand place the concrete block mats adjacent to the piles.

TS-6.0 Filter Fabric Materials and Construction

TS-6.1 The filter fabric will be either attached to the bottom of the articulated block mats or staked in place. The filter fabric will be a woven fabric with high tensile strength, which allows for passage of water with high soil containment. Fabric overlaps will not be less than 36". The geotextile will extend at least one (1) foot beyond the top and bottom revetment termination points. CONTRACTOR will submit, for approval by the ENGINEER, a physical sample (6"x6") and the product data sheets prior to installation.

TS-7.0 Sand Filled Geotextile Bags

TS-7.1 The Geotextile Bag will be placed around piles in order to fill in the existing scour hole around the piles to create a level platform prior to the installation of the Articulated Concrete Block and geotextile fabric. The CONTRACTOR is given flexibility with respect to the actual size of geotextile bags utilized, however we expect that numerous sizes may be required to ensure that relatively flat smooth surface is created prior to the installation of the Articulated Block Mat. Geotextile Bags will be hand placed by divers and there will be no more than a 1 inch vertical relief between geotextile bags.

Indications are that the scour hole is 2 feet or less however the CONTRACTOR will verify the actual conditions in the field. CONTRACTOR will submit, for approval by the ENGINEER, a physical sample of the Geotextile Bag, the product data sheets prior to installation, and size of bags proposed for construction. The Geotextile Fabric shall be a woven, geotextile made of 100% polypropylene yarns and meet the following M.A.R.V values below:

Physical Property	Test Procedure	Minimum Value
Tensile Strength	ASTM D-4632	500 x 560 lbs
Elongation @ Break	ASTM D-4632	15 x 20%
Puncture Strength	ASTM D-4833	290 lbs
Trapezoidal Tear	ASTM D-4533	300 x 315 lbs
Apparent Opening Size	ASTM D-4751	100 US Sieve
Permittivity	ASTM D-4491	0.10 Sec-1
Water Flow Rate	ASTM D-4491	14 g/min/sf
UV Resistance @ 1,200 Hrs	ASTM D-435	5 70%

TS-7.2 Sand used to fill the Geotextile Bags will come from an offsite source and be clean of debris and organic material. The mean grain size shall be greater than 25mm and no more than 2% fines passing the #200 sieve. The CONTRACTOR will submit to the ENGINEER for approval a small ziplock bag with sand sample and a granulometrics report showing the % fines, % percent gravel, % organics, and mean grain size characteristics.

TS-7.3 Contractor will be paid on a tonnage basis of material delivered to the site. Contractor shall provide weight tickets for each truck load of sand delivered to the site. Contractor shall submit with each payment request a summary sheet of all the weights of trucks delivered to the site each day and an original copy of each weight ticket. The CONTRACTOR may be required to provide weight tickets to County staff on a daily basis. Any unused sand on site will be removed by the CONTRACTOR at no cost to the Owner.

ELASTOMERIC BEARING PADS

SCOPE Provide elastomeric bearing pads for use in bridges and other structures.

REQUIREMENTS A General

The basis of design for all bearing pads is in conformance with Method A of the AASHTO LRFD Bridge Design Specifications. Use a bearing pad supplier listed on the "Approved/Qualified Products List for Bridge Products, Elastomeric Bearing Pads". Test and manufacture elastomeric bearing pads in accordance with AASHTO M 251 except as modified in this special provision. Provide bearing pads no greater than ½ in [13 mm] thick, fabricated of all elastomer. Plain elastomer pads may be cut from larger sheets cast to the thickness shown on the plans. Avoid heating or damaging the material when cutting. Ensure the cutting produces smooth edges at least meeting the requirements of ANSI 250 finish. Provide bearings of laminated construction when pads are greater than ½ in [13 mm] thick. Refer to AASHTO M 251 for tolerances, dimensions, and configurations, except provide elastomer to a thickness of ¼ in [6 mm] within a range from + 1 /8 inch to – 1 /16 inch [+3 mm to –2 mm] to cover the top and bottom steel plates. Provide laminated pads meeting the following requirements or characteristics: (1) Consisting of alternate layers of elastomer and metal reinforcement integrally bonded together, (2) Containing reinforcement spaced as shown on the plans, and parallel to the top and bottom surfaces of the pad, and (3) Including the manufacturer's name or trademark molded into the edge of the pad. Do not expose the finished laminated pad to temperatures greater than 400°F [205°C]. Cover the edges of metal reinforcement with ¼ in [6 mm] of elastomer.

B Physical Properties Substitute the requirements of sections 4.1 and 4.2 of AASHTO M 251; comply with B.1 & B.2 in this specification.

B.1 Elastomer Use elastomer compound containing only virgin crystallization resistant polychloroprene (neoprene) or virgin natural polyisoprene (natural rubber) as the raw polymer. Use only new material with no reclaimed material incorporated in the finished bearing. Provide elastomer for bearing pads meeting the requirements of AASHTO M 251 with durometer hardness of 60 on the Shore "A" scale. Provide elastomer compounds classified as Low-Temperature Zone D, Grade 4 or 5 meeting the requirements of AASHTO LRFD Bridge Design Specifications, Table 14.7.5.2-1, "Low-Temperature Zones and Minimum Grades of Elastomer". Utilize cotton duck bearing pads (CDP) where MnDOT Bridge Details Part 1 B310 and B354 are included in the plans or when MnDOT Bridge Details Part 1 B311 or B355 utilize plain (non-steel reinforced) elastomeric bearing pads. Test and manufacture CDP in accordance with Military Specification MIL-C-882E. For CDP, waive additional sampling and testing requirements listed in this specification.

B.2 Properties Test and accept sampled bearings in accordance with the following:

Material	Durometer	Physical properties	Hardness (ASTM D 2240)	Tensile strength (ASTM D 412)	Ultimate elongation (ASTM D 412)	Heat resistance (ASTM D 573)	Temperature / Aging Time	Hardness, maximum Shore "A" points change	Tensile strength, maximum percent change	Ultimate elongation, maximum percent change	Compression set (ASTM D 395, method B)
Natural Polyisoprene (Natural Rubber)	60±5	60±5	60±5	2250 psi [15.5 MPa]	2250 psi [15.5 MPa]	158°F [70°C]/168hrs	212°F [100°C]/70hrs	+10 +15	–25% –15%	–25% –40%	25 N.A. 22 hrs. at 158°F [70°C], maximum percent 22 hrs. at 212°F [100°C], maximum percent N.A.
Polychloroprene (Neoprene)	60±5	60±5	60±5	2250 psi [15.5 MPa]	2250 psi [15.5 MPa]	158°F [70°C]/168hrs	212°F [100°C]/70hrs	+10 +15	–25% –15%	–25% –40%	25 N.A. 22 hrs. at 158°F [70°C], maximum percent 22 hrs. at 212°F [100°C], maximum percent N.A.

35 Low Temperature Test (ASTM D

746, procedure B) No Failure No Failure Brittleness at -54.4°F [-48°C] Laminated Pad Adhesion Test (ASTM D 429, method B) 40 psi [0.276 MPa] 40 psi [0.276 MPa] Bond Strength (Peel Test) Compressive Strain of Laminated Bearings Test each sampled laminated pad for compressive strain. The compressive strain in any layer of a laminated pad shall not exceed 9 percent at 1250 pounds per in² [8.62 MPa] average unit pressure for the full size laminated pad. Proof Load Testing Proof load each bearing pad per AASHTO M 251, Section 8.8.2. Use a compressive load of 1800 pounds per in² [12.41 MPa] for laminated pads and 1200 pounds per in² [8.27 MPa] for plain elastomeric pads. Reject bearing pads if bulging patterns imply laminate placement does not satisfy design criteria and manufacturing tolerances, or if bulging suggests inadequate laminate bond. Also reject bearing pads if there are three separate surface cracks greater than 1/16 in [1.5 mm] wide by 1/16 in [1.5 mm] deep. B.3 Metal Reinforcement Provide mild steel plates at least 1/8 in [3 mm] thick for use as metal reinforcement. C Certification Submit to the Engineer a manufacturer's Certificate of Compliance. 3741.3 SAMPLING AND TESTING A Manufacturer Sampling and Testing Sample and test in accordance with AASHTO M 251, Section 8 except as modified in this special provision. Destructive test finished laminated and plain bearing pads at a rate of two full size bearing pads per lot (produced from the same raw material utilizing the same processes and procedures). A lot shall not exceed 100 pads and is not limited to finished sizes or thickness. Destructive testing is defined as any test that renders the product not usable for its intended purpose. Provide bearing pad test data and certification prior to shipping. Test results of samples must verify compliance to product specifications. Any bearing tested that does not meet the specifications will result in the rejection of the entire lot. When applicable, the supplier shall retain a copy of the passing test results for one year and supply the document with subsequent jobs. The cost of all bearing pad testing is incidental to the bearing pads.

EXHIBIT N
FDOT AND LEE COUNTY DESIGN STANDARDS

The following design standards are expressly agreed to be incorporated by reference and made a part of this Agreement:

1. Florida Department of Transportation FY 2019 Standard Plans as published at the following link:

<http://www.fdot.gov/design/standardplans/current/default.shtm>

2. Lee County Department of Transportation Plan Specifications for Sign Installation, **March 2015** edition as published at the following link:

<http://www.leegov.com/dot/traffic/trafficsigninstallation>

3. Lee County Department of Transportation Plan Specifications for Signal & Street Lighting, April 15, 2014 edition as published at the following link:

<http://www.leegov.com/dot/traffic/trafficstandard>

4. Lee County Utilities Design Manual, the latest edition as published at the following link:

<http://www.leegov.com/utilities/design-manual>

In the event of discrepancies between the Lee County and FDOT design standards, Lee County Standards shall govern.

EXHIBIT O
DEVELOPMENTAL SPECIFICATIONS

I hereby certify that these Developmental Specifications have been properly prepared by me, or under my responsible charge:

Developmental Specifications Section(s): Reserved		
Signature:		
Date:		
Engineer of Record:		
Florida License No.:		
Firm Name:		
Firm Address:		
City, State, Zip Code:		
Cert. of Authorization No:		

EXHIBIT P
OTHER RELEVANT FORMS