

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION



BID PROPOSAL

CONTRACT T201907601

BR 3-155N&S ON SR1 OVER BROADKILL RIVER

Federal Aid No. EBHN-S014(22)
CFDA: 20.205

Advertisement Date: August 6, 2020

INCLUDED IN THIS DOCUMENT:

BID PROPOSAL:

GENERAL DESCRIPTION
PROSPECTIVE BIDDERS NOTES
GENERAL NOTICES
PREVAILING WAGES
SPECIAL PROVISIONS
STATEMENTS
QUANTITY SHEET SUMMARY

ADDITIONAL BID PROPOSAL ITEMS:

ATTACHED OR POSTED DOCUMENTS:

PROJECT PLANS
QUESTIONS & ANSWERS (if posted)
GUARDRAIL END-TREATMENT INFO
OJT GUIDELINES

**PAPER BIDDERS CONTACT DELDOT
FOR BID SUBMITTAL DOCUMENTS:**

DRUG TESTING AFFIDAVIT
CERTIFICATION FORM
BID BOND FORM
CD FOR BID PRICE ENTRY & PRINTING

This Bid Proposal and related documents can be viewed on bids.delaware.gov and bidx.com/de/

Internet Bids for Bidders with Bid Express® accounts can be submitted at [BIDX.com/de](https://bidx.com/de/); **OR**;

Paper Bids with CD will be received in the Bidder's Room at the DelDOT Administration Building, Dover, DE;

ALL BIDS DUE PRIOR TO 2:00 P.M. Local Time, September 15, 2020

GENERAL DESCRIPTION

- A. BIDS DUE:** **September 15, 2020** **PRIOR TO 2:00 P.M. Local Time** – unless changed via Addendum.
LOCATION: Bidder's Room, DelDOT Administration Building, 800 South Bay Road, Dover, DE 19901.
OR; Bidders with Bid Express® accounts can submit bids at BIDX.com/de.
- B. PRE-BID MEETING:** No
- C. DBE GOAL:** 9% Disadvantaged Business Enterprise Percent
- D. OJT TRAINEES:** Two (2) **See Prospective Bidder's Notes and posted OJT Manual for details.**
- E. LOCATION:** Sussex County
 These improvements are more specifically shown on the Location Map(s) of the attached Plans.
- F. DESCRIPTION:** The improvements consist of furnishing all labor and materials for the rehabilitation of BR 3-155N&S. This project involves replacement of the existing concrete deck with a new concrete deck and barriers, replacement of bearings, constructing new bearing pedestals, cleaning and painting of steel members, repair of cracks and spalls in the concrete piers and abutments, replacement of pile jackets, and placement of riprap for scour protection. Some of the additional work includes minor approach roadway reconstruction. The crossovers will be constructed prior to the project.
- G. COMPLETION TIME:** All work on this contract must be complete within 521 Calendar Days.
 The Contract Time includes an allowance for 94 Weather Days.
 The Department's intent is to issue a Notice to Proceed for work to start on or about October 1, 2020.
- H. SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DELAWARE DEPARTMENT OF TRANSPORTATION, AUGUST 2016** apply to this Bid Proposal and Project. The Contractor shall make himself aware of any revisions and corrections (Supplemental Specifications, if any) and apply them to the applicable item(s) of this contract. The Standard and Supplemental Specifications can be viewed [here](#). Units of Measure can be found at 101.04.
- I. ATTACHMENTS:** Included as part of this Bid Proposal are; *Project Plans; Questions & Answers* (if posted); *Addenda, Referenced Documents, Documents Posted with this Bid Proposal;* and *Bid documents mailed to contractors.*
- J. ADDENDA:** All Addenda are posted on the internet at bids.delaware.gov, and bidx.com/de/ and are included as part of the Bid Proposal. The Bidder is responsible to check the Website as needed to ensure that the Bidder is aware of Addenda that are included in the Bid Proposal. If Addenda are issued, the final Addendum will be posted no later than the end of the day two business days prior to the bid date. Each Addendum number and issue date must be entered on the submitted Certification Form. This original Bid Proposal will not be updated, you must refer to each Addendum.
- K. QUESTIONS:** E-MAIL TO; dot-ask@delaware.gov
 Questions regarding this project are to be e-mailed to the above address no less than **six business days** prior to the bid opening date in order to receive a posted response. Please include the Contract number in the subject line. Questions and responses are posted at bids.delaware.gov, and bidx.com/de/. The date of the final posted Questions and Answers document must be entered on the submitted Certification Form.
- L. Time is of the essence and is an essential element of this Contract.** The Contract Drawings and notes provide a sequence of construction for this Contract. Several temporary traffic conditions shown on the Plans and listed below will result in significant congestion, delay, and/or operational constraints to the traveling public.
- 1. Disincentives for Construction Phases**

The Maintenance of Traffic (MOT) shown on the plans for Phases 1 and 3 of this contract will result in significant congestion, delay, and/or operational constraints to the traveling public. For each Phase, a number of Calendar Days

allotted time are indicated. Disincentives in the amount of Twelve Thousand Dollars (\$12,000.00) per Calendar Day will be assessed for each Calendar Day the MOT is in place in excess of the number of Calendar Days indicated for that Phase. The amount of disincentives shall be deducted from any money due the Contractor, not as a penalty, but as a Liquidated Damage assessed to recover the cost of inconvenience to the public, the added cost of engineering and supervision, and the other extra expenditures of public funds caused by the Contractor's failure to complete the Work within an allotted time. Damages in excess of any monies due or retained percentage shall be paid to the Department by the Contractor.

- i. Phase 1 – Contraflow on the Existing Northbound Bridge [Starting no earlier than January 4, 2021 and finishing no later than March 11, 2021 (67 Calendar Days Allotted Time including 23 weather days)] – A lane reduction approaching the work area is required in each direction and southbound traffic will be crossed over to the northbound roadway (i.e. contraflow) using the temporary crossovers. The traffic control devices present in Phase 1 that implement the lane reductions and contraflow movement must be removed and two travel lanes must be restored in each direction of SR 1 as shown on the Phase 2 plans.
- ii. Phase 3 – Contraflow on the Existing Southbound Bridge [Starting no earlier than October 6, 2021 and finishing no later than December 9, 2021 (65 Calendar Days Allotted Time including 10 weather days)] – A lane reduction approaching the work area is required in each direction and northbound traffic will be crossed over to the southbound roadway (i.e. contraflow) using the temporary crossovers. The traffic control devices present in Phase 3 that implement the lane reductions and contraflow movement must be removed and two travel lanes must be restored in each direction of SR 1 as shown on the Phase 4 plans.

2. Updates and Other General Conditions

1. In order to minimize disruption and cost to the traveling public, the Contractor shall give his/her full attention to the project, such that work will be completed as soon as possible after “Notice to Proceed”.
2. The Disincentives specified in Paragraph A above do not alter or replace the liquidated damages as specified in Standard Specification Subsection 108.08 “Failure to Complete on Time”. Once the Contract Completion Date has been reached, liquidated damages will be assessed on the Contract as a whole.
3. The completeness of work shall be determined solely by the Engineer.
4. Calendar Days for the Disincentive shall be defined as the 24 hour period starting at the time the MOT measures (impacting traffic) are implemented for the Construction Phase. For example, if the MOT measures are implemented at 8:00 p.m., one Calendar Day will be reached by 8:00 p.m. the following day.
5. The Contractor may propose a different sequence of construction or modified construction phasing / MOT plan that does not exactly match the construction phasing / MOT shown on the plans. As part of the approval process, the Engineer shall impose similar Calendar Day restrictions on the modified construction phasing / MOT as appropriate. The Engineer may reject the Contractor’s modified construction phasing / MOT plan for any reason. The Contractor shall have no claim against the Department for costs or delays due to the Department’s rejection of a modified construction phasing / MOT plan, including, but not limited to, development costs, loss of anticipated profits, increased material cost, or increased labor costs.
6. In the event that contract changes affect the critical path for all work to be performed under the original proposal, contract time will be shortened or lengthened based on the Engineer’s approval. The Engineer shall be the sole judge as to what and whether a time reduction or extension shall be considered justifiable and each extension granted shall be documented in writing by the Engineer with reason for the extension. The Contractor is advised that in order to complete the work on or before the number of calendar days permitted by the contract, it may be necessary to provide multiple crews, work extended hours, overtime, and/or weekends and holidays without additional cost to the Department.

3. Definition of Phase 1 and Phase 3 Work

Phase 1 – Southbound Bridge

1. Removing portions of the bridge as shown on the Plans.
2. Constructing new concrete bearing pedestals.

3. Erecting the new superstructure and constructing the longitudinal closure pours and transverse expansion joint and link slabs.
4. Constructing the new shear blocks, backwalls, and cheekwalls.
5. Constructing the sleeper slabs and approach slabs.
6. Constructing the deck overs.
7. Constructing the cast-in-place portions of the parapets.
8. Diamond grinding the bridge deck and approach slabs.
9. Constructing the PPC overlay.
10. Removal of Phase 1 temporary traffic control devices. Installation of Phase 2 temporary traffic control devices and opening the roadway to traffic as shown on the Phase 2 plans.

Phase 3 – Northbound Bridge

1. Removing portions of the bridge as shown on the Plans.
2. Constructing new concrete bearing pedestals.
3. Erecting the new superstructure and constructing the longitudinal closure pours and transverse expansion joint and link slabs.
4. Constructing the new shear blocks, backwalls, and cheekwalls.
5. Constructing the sleeper slabs and approach slabs.
6. Constructing the deck overs.
7. Constructing the cast-in-place portions of the parapets.
8. Diamond grinding the bridge deck and approach slabs.
9. Constructing the PPC overlay.
10. Removal of Phase 3 temporary traffic control devices. Installation of Phase 4 temporary traffic control devices and opening the roadway to traffic as shown on the Phase 4 plans.

4. Additional Disincentive Provisions

Disincentives for Lane Closures

The Contract permits the closure of SR 1 lanes to perform construction. Interim Road User Cost (RUC) disincentives for delays in opening lanes along SR 1 NB and SB will be enforced according to the tables below. RUC disincentives for lane closures will not be assessed during Phases 1 and 3 with 24/7 long term lane closures on SR 1 are permitted in conjunction with the contraflow operations.

Table 1a – Liquidated Damages for Failure to Reopen a Lane (AM)

Time All Lanes Reopened (“Verizon Time”)	Single Lane Closure
6:00 AM to 6:14 AM	\$300.00
6:15 AM to 6:29 AM	\$600.00
6:30 AM to 6:44 AM	\$900.00
6:45 AM to 6:59 AM	\$1,200.00
7:00 AM to 7:14 AM	\$1,500.00
7:15 AM to 7:29 AM	\$1,800.00
7:30 AM to 7:44 AM	\$2,100.00
7:45 AM to 7:59 AM	\$2,400.00
8:00 AM to 8:14 AM	\$2,700.00
8:15 AM to 8:29 AM	\$3,000.00
8:30 AM to 8:44 AM	\$3,300.00

8:45 AM to 8:59 AM	\$3,600.00
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For every hour, or portion thereof that a lane remains closed after 8:59 AM, \$1,200.00 will be assessed up to a **one day total of \$7,200.00**.

Table 1b – Liquidated Damages for Failure to Reopen a Lane (PM)

Time All Lanes Reopened (“Verizon Time”)	Single Lane Closure
3:00 PM to 3:14 PM	\$300.00
3:15 PM to 3:29 PM	\$600.00
3:30 PM to 3:44 PM	\$900.00
3:45 PM to 3:59 PM	\$1,200.00
4:00 PM to 4:14 PM	\$1,500.00
4:15 PM to 4:29 PM	\$1,800.00
4:30 PM to 4:44 PM	\$2,100.00
4:45 PM to 4:59 PM	\$2,400.00
5:00 PM to 5:14 PM	\$2,700.00
5:15 PM to 5:29 PM	\$3,000.00
5:30 PM to 5:44 PM	\$3,300.00
5:45 PM to 5:59 PM	\$3,600.00
6:00 PM to 6:14 PM	\$3,900.00
6:15 PM to 6:29 PM	\$4,200.00
6:30 PM to 6:44 PM	\$4,500.00
6:45 PM to 6:59 PM	\$4,800.00

For every hour, or portion thereof that a lane remains closed after 6:59 PM, \$1,200.00 will be assessed up to a **one day total of \$7,200.00**.

Disincentives for Roadway Closures and Detours

The Contract permits the closure and detour of SR 1 NB and SB to perform bridge construction. Interim Road User Cost (RUC) disincentives for delays in opening the roadway following a roadway closure and detour along SR 1 NB and SB will be enforced according to the table below:

Table 2 – Liquidated Damages for Failure to Reopen the Roadway

Time All Lanes Reopened (“Verizon Time”)	Road Closure
6:00 AM to 6:14 AM	\$2,500.00
6:15 AM to 6:29 AM	\$5,000.00
6:30 AM to 6:44 AM	\$7,500.00
6:45 AM to 6:59 AM	\$10,000.00
7:00 AM to 7:14 AM	\$15,000.00
7:15 AM to 7:29 AM	\$20,000.00
7:30 AM to 7:44 AM	\$25,000.00
7:45 AM to 7:59 AM	\$30,000.00
8:00 AM to 8:14 AM	\$34,500.00
8:15 AM to 8:29 AM	\$39,000.00
8:30 AM to 8:44 AM	\$43,500.00

8:45 AM to 8:59 AM	\$48,000.00
Not Open by 9:59 AM	\$68,000.00

For every hour, or portion thereof that a direction of the roadway remains closed after 9:59 AM, \$20,000.00 will be assessed up to a **one day total of \$100,000.00**.

Assessment of Road User Costs (RUCs) and Liquidated Damages will be made by change order. There is no limit on the number of hours or days that RUCs can be assessed. The Engineer will be the sole approving authority as to when road closures, lane closures, lane width restrictions, and shoulder width restrictions are complete after traffic is returned to the ultimate alignment. The Contractor will be assessed the RUCs for failure to open the roadway on time per the Contract.

5. Additional Notes

Liquidated Damages from these notices shall be combined when multiple requirements are not met. For example, if SR 1 remains in contraflow beyond the number of calendar days permitted by the Contract and a lane closure extends beyond the allowable closure time, liquidated damages from both infractions will be added together and deducted from any monies due to the Contractor as a cumulative liquidated damage.

M. PROSPECTIVE BIDDERS NOTES:

- BIDDERS MUST BE REGISTERED** with DelDOT in order to submit a bid. E-Mail dot-ask@delaware.gov or call (302) 760-2031 to request registration information.

- BIDS MUST BE SUBMITTED VIA:**

(a) **Internet** - Bidders with Bid Express® accounts can submit bids at www.bidx.com/de/.

OR:

(b) **Paper Bid** with supplied CD and printout of Bid Item prices and all required documents and forms.

For paper bids, contact DelDOT at dot-ask@delaware.gov or (302) 760-2031 to request a CD for bidding, required forms, and instructions. Bidders enter their Bid Item prices onto the supplied CD then print the form and submit the form along with the CD and other required documents prior to the Bid due date and time.

(CD's cannot be used to submit bids to bidx.com)

Do not submit both Internet and Paper Bids. If so, the Internet bid will be rejected.

- SURETY BOND** - Each proposal must be accompanied by a deposit of either surety bond or security for a sum equal to at least 10% of the amount bid.
- DRUG TESTING** - Regulation 4104; The state Office of Management and Budget has developed regulations that require Contractors and Subcontractors to implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds pursuant to 29 Del.C. §6908(a)(6). **Refer to the full requirements at the following link:**

<http://regulations.delaware.gov/register/december2017/final/21%20DE%20Reg%20503%2012-01-17.htm>

Note a few of the requirements;

- * **At bid submission** - Each bidder must submit with the bid a single signed affidavit certifying that the bidder and its subcontractors has in place or will implement during the entire term of the contract a Mandatory Drug Testing Program that complies with the regulation (*a blank affidavit form is attached*);
- * **At least two business days prior to contract execution** - The awarded Contractor shall provide to DelDOT copies of the Employee Drug Testing Program for the Contractor, each participating DBE firm, and all other listed Subcontractors;
- * **Subcontractors** - Contractors that employ Subcontractors on the job site may do so only after submitting a copy of the Subcontractor's Employee Drug Testing Program along with the standard required subcontractor information. A Subcontractor shall not commence work until **DelDOT** has approved the program in writing.

5. **PERFORMANCE-BASED RATING SYSTEM** - 29 Del.C. §6962 (c)(12)(a) requires DelDOT to include a performance-based rating system for contractors. The Performance Rating for each Contractor shall be used as a prequalification to bid at the time of bid. Refer to '*General Notices*' for details.
6. **NO RETAINAGE** will be withheld on this contract unless through the Performance-Based Rating System.
7. **EXTERNAL COMPLAINT PROCEDURE** can be viewed on DelDOT's Website, https://deldot.gov/Business/cr/index.shtml?dc=civil_rights_eeo or request a copy by calling (302) 760-2555.
8. **DBE PROGRAM REQUIREMENTS** (49CFR §26.53(b)(3)(i)(B)) require submission of DBE participation information from the apparent low bidder no later than five (5) calendar days after bid opening,
9. **FLATWORK CONCRETE TECHNICIAN CERTIFICATION TRAINING:**
Section 501.03, 503.03, 505.03, 610.03, 701.03 and 702.03 of the 2016 Standard Specifications require contractors to provide an American Concrete Institute (ACI) or National Ready-Mix Concrete Association (NRMCA) certified concrete flatwork technician to supervise all finishing of flatwork concrete.
10. On The Job Trainee(s). The program(s) must be submitted online as soon as possible by the apparent low bidder at <https://deldotojt.com>. Award of the Contract will not take place until acceptable On-the-Job (OJT) program plans are received and approved by the Department's Civil Rights Section. Failure of the apparent low bidder to submit acceptable OJT Trainee Programs within ten (10) calendar days of bid opening shall create a rebuttable presumption that the bid is not responsive.

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GENERAL NOTICES

SPECIFICATIONS :

The Delaware specifications entitled "*Standard Specifications for Road and Bridge Construction August, 2016*", hereinafter referred to as the *Standard Specifications*; the *Supplemental Specifications* to the Standard Specifications effective as of the advertisement date of this Bid Proposal and hereby included by reference; the *Special Provisions*; *Notes on the Plans*; this *Bid Proposal* including referenced documents; any *Addenda* thereto; and any posted *Questions and Answers*; shall govern the work to be performed under this contract. The Contractor shall make itself aware of these specifications, revisions and corrections, and apply them to the applicable item(s) of this contract.

CLARIFICATIONS :

Under any Section or Item included in the Contract, the Contractor shall be aware that when requirements, responsibilities, and furnishing of materials are outlined in the details and notes on the Plans and in the paragraphs preceding the "Basis of Payment" paragraph in the Standard Specifications or Special Provisions, no interpretation shall be made that such stipulations are excluded because reiteration is not made in the "Basis of Payment" paragraph.

ATTESTING TO NON-COLLUSION :

The Department requires as a condition precedent to acceptance of bids a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with such contract. The form for this sworn statement is included in the proposal and must be properly executed in order to have the bid considered.

QUANTITIES :

The quantities shown are for comparison of bids only. The Department may increase or decrease any quantity or quantities without penalty or change in the bid price.

PERFORMANCE-BASED RATING SYSTEM

29 Del.C. §6962 (c)(12)(a) requires a Department of Transportation project, excluding a Community Transportation Fund or municipal street aid contract, to include a performance-based rating system. At the time of bid, the Performance Rating for each Contractor shall be used as a prequalification to bid.

Bidders with Performance Rating scores equal to or greater than 85% shall be permitted to bid. Bidders with scores of less than 85% who comply with the retainage requirements of 29 Del.C. §6962 shall be permitted to bid provided the *Agreement to Accept Retainage* (located on the Certification Page) is executed and submitted with the bid. Lack of an executed *Agreement to Accept Retainage* will result in the rejection of the bid by the Department. Successful bidders awarded Department contracts who have no performance history within the last five (5) years will be assigned a provisional Performance Rating of 85% at the date of advertisement.

Notification of Performance Rating. The Department shall post publicly the Performance Rating for all Contractors on the Department's [website](#). DelDOT will complete performance-based evaluations on the construction company contracted by the Department to build the project (the "Contractor"). Provisions to appeal Performance Ratings are described in the regulations. The regulations are set forth in Section 2408 of Title 2, Delaware Administrative Code, found [here](#).

EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS :

Delaware Code, Title 29, Chapter 69, Section 6962, Paragraph (d), Subsection (7) states;

- a. As a condition of the awarding of any contract for public works financed in whole or in part by State appropriation, such contracts shall include the following provisions:

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, sexual orientation, gender identity or national origin. The contractor will take positive steps to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, color, sex, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.
2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, sexual orientation, gender identity or national origin.
3. The contractor will ensure employees receive equal pay for equal work, without regard to sex. Employee pay differential is acceptable if pursuant to a seniority system, a merit system, a system which measures earnings by quantity or quality of production, or if the differential is based on any other factor other than sex.

TAX CLEARANCE :

As payments to each vendor or contractor aggregate \$2,000, the Division of Accounting will report such vendor or contractor to the Division of Revenue, who will then check the vendor or contractor's compliance with tax requirements and take such further action as may be necessary to ensure compliance.

LICENSE :

A person desiring to engage in business in this State as a contractor on a project designated to include federal funds, shall obtain a Delaware business license upon making application to the Division of Revenue. Proof of said license compliance to be made prior to, or in conjunction with, the execution of a contract to which he has been named.

SUBCONTRACTOR LICENSE: 29 DEL. C. §6967:

- (c) Any contractor that enters a public works contract must provide to the agency to which it is contracting, within 30 days of entering such public works contract, copies of all occupational and business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the contractor entered the public works contract the occupational or business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

DIFFERING SITE CONDITIONS:

SUSPENSIONS OF WORK and SIGNIFICANT CHANGES IN THE CHARACTER OF WORK:

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 they are disturbed and before the affected work is performed.

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

No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has provided the required written notice. No contract adjustment will be allowed under their clause for any effects caused on unchanged work.

Suspensions of work ordered by the engineer: If the performance of all or any portion of the work is suspended or delayed by the engineer in writing for an unreasonable period of time (not originally anticipated, customary or inherent to the construction industry) and the contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, the contractor shall submit to the engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

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

No contract adjustment will be allowed unless the contractor has submitted the request for adjustment within the time prescribed. No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any other term or condition of this contract.

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

If the alterations or changes in quantities significantly change the character of the work under the contract, whether or not changed by any such different quantities or alterations, an adjustment, excluding loss of anticipated profits, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the contractor in such amount as the engineer may determine to be fair and equitable.

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

- (A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction, or
- (B) When a major item of work, as defined elsewhere in the contract, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed.

CONFLICT WITH FEDERAL STATUTES OR REGULATIONS:

Delaware Code, Title 29, Chapter 69, Section 6904, Paragraph (a):

"If any provision of this subchapter conflicts or is inconsistent with any statute, rule or regulation of the federal government applicable to a project or activity, the cost of which is to be paid or reimbursed in whole or in part by the federal government, and due to such conflict or inconsistency the availability of federal funds may be jeopardized, such provision shall not apply to such project or activity."

FEDERAL LABOR AND EMPLOYMENT REQUIREMENTS

Federal Regulation 23 CFR § 635.117(b) Labor and employment, states:

"No procedures or requirement shall be imposed by any State which will operate to discriminate against the employment of labor from any other State, possession or territory of the United States, in the construction of a Federal-aid project."

CONVICT PRODUCED MATERIALS:

(a) Materials produced after July 1, 1991, by convict labor may only be incorporated in a Federal-aid highway construction project if such materials have been:

- (1) Produced by convicts who are on parole, supervised release, or probation from a prison or
- (2) Produced in a qualified prison facility and the cumulative annual production amount of such materials for use in Federal-aid highway construction does not exceed the amount of such materials produced in such facility for use in Federal-aid highway construction during the 12-month period ending July 1, 1987.

(b) Qualified prison facility means any prison facility in which convicts, during the 12-month period ending July 1, 1987, produced materials for use in Federal-aid highway construction projects.

RIGHT TO AUDIT

The Department shall have the right to audit the books and records of the contractor or any subcontractor under this contract or subcontract to the extent that the books and records relate to the performance of the contract or subcontract. The books and records shall be maintained by the contractor for a period of 3 years from the date of final payment under the prime contract and by the subcontractor for a period of 3 years from the date of final payment under the subcontract (29 Del.C. §6930)

TO REPORT BID RIGGING ACTIVITIES:

The U. S. Department of Transportation (DOT) operates the below toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

TO REPORT BID RIGGING ACTIVITIES
CALL 1-800-424-9071

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(EXECUTIVE ORDER 11246)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

Goals for Minority Participation In
Each Trade

12.3% (New Castle County)
14.5% (Kent & Sussex Counties)

Goals for Female Participation In
Each Trade

6.9% (Entire State)

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the Executive Order and the regulations in CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is the County specified in the General Description section.

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

1. As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
 - d. "Minority" includes:
 - i. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - ii. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - iii. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - iv. American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Program Office or from the Federal procurement contracting offices. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
 - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
 - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
 - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
 - d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
 - e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
 - f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
 - g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
 - h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
 - i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
 - j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.
 - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

- l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
 - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
 - n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - o. Document and maintain a record of all solicitations of offers for subcontractors from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participating, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
 9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is under utilized).
 10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
 11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
 12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Order of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
 13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
 14. The Contractor shall designate a responsible official to monitor all employment-related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours

worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

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TRAINING SPECIAL PROVISIONS

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities", (Attachment 1), and is in implementation of 23 U.S.C. 140(a).

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 journeyman in the type of trade or job classification involved.

The number of trainees to be trained under the special provision will be as set forth in the General Description section of this document. In the event the contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year apprenticeship or training.

The number of trainees shall be distributed among the work classification on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Department of Highways and Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. 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 that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should 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 in the training program selected by the contractor and approved by the Department of Highways and Transportation and the Federal Highway Administration. The Department of Highways and Transportation and the Federal Highway Administration shall approve a program if 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 classification concerned by the end of the training period. 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 contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work the classification covered by the program. It is the intention of these provisions that the 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, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some off-site training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other sources does not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for off-site training indicated above may only be made to the contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training; provides the instruction of the trainee; or pays the trainee's wages during the off-site training period.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainees as a journeyman, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. A contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid a least 60 percent of the appropriate minimum journeymen's rate specified in the contract for the first half of the of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees is an approved existing program are enrolled as trainees on this project. In fact case, the appropriate rates approved by the Department of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provisions.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training.

The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

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INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT
& TRANSPORTATION EQUITY ACT

Recipients of Federal-aid highway funds authorized under Titles I (other than Part B) and V of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), or Titles I, III, and V of the Transportation Equity Act for the 21st Century (TEA-21) are required to comply with the regulations of 49 Code of Federal Regulations (CFR) Part 26 - Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM SPECIFICATION

The U.S. Department of Transportation (DOT) requires that the Delaware Department of Transportation continue the established Disadvantaged Business Enterprise (DBE) Program for participation in U.S. DOT programs and that the program follow the final rules as stated in 49 CFR Part 26 and the Department's approved DBE Program plan.

The following definitions apply to this subpart:

Disadvantaged Business Enterprise or DBE means a for-profit small business concern (1) that is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals; and, (2) whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

DOT-assisted contract means any contract between a recipient and a contractor (at any tier) funded in whole or in part with DOT financial assistance, including letters of credit or loan guarantees, except a contract solely for the purchase of land.

Good Faith Efforts means efforts to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement.

Joint Venture means an association of a DBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which the parties combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

Race-conscious measure or program is one that is focused specifically on assisting only DBEs, including women-owned DBEs.

Race-neutral measure or program is one that is, or can be, used to assist all small businesses. For the purposes of this part, race-neutral includes gender neutrality.

Small Business concern means, with respect to firms seeking to participate as DBEs in DOT-assisted contracts, a small business concern as defined pursuant to section 3 of the Small Business Act and Small Business Administration regulations implementing it (13 CFR part 121) that also does not exceed the cap on average annual gross receipts specified in 49 CFR §26.65(b).

Socially and economically disadvantaged individuals means any individual who is a citizen (or lawfully admitted permanent resident) of the United States and who is - (1) any individual who a recipient finds to be a socially and economically disadvantaged individual on a case-by-case basis; (2) any individual in the following groups, members of which are rebuttably presumed to be socially and economically disadvantaged:

- (i) Black Americans which includes persons having origins in any of the Black racial groups of Africa;
- (ii) Hispanic Americans which includes persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race;
- (iii) Native Americans which includes persons who are American Indians, Eskimos, Aluets, or Native Hawaiians;
- (iv) Asian-Pacific Americans which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Commonwealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kirbati, Juvalu, Nauru, Federated States of Micronesia, or Hong Kong;
- (v) Subcontinent Asian Americans which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka;
- (vi) Women;
- (vii) Any additional groups whose members are designated as socially and economically disadvantaged by the SBA, at such time as the SBA designation becomes effective.

DelDOT will establish specific goals for each particular DOT-assisted project which will be expressed as a percentage of the total dollar amount of contract bid. The specific contract goals for this contract are specified in the General Description section of this document.

DelDOT continues to reserve the right to approve DBE subcontractors and all substitutions of DBE subcontractors prior to award and during the time of the contract.

Bidders are required to submit with their bids the completed DBE Program Assurance portion of the Certification document which will state the bidders intent of meeting the goals established for this contract; or in the instance where a contractor cannot meet the assigned DBE Goals for this contract, he/she shall at the time of bid submit documentation required to verify that he/she has made a Good Faith Effort to meet the DBE Goals. Guidance for submitting a Good Faith Effort is identified in the next section and in the DBE Program Plan. Further, the apparent low bidder must submit to DelDOT within five (5) calendar days after the bid opening, executed originals of each and every DBE subcontract to satisfy contract goals consistent with the DBE Program Assurance submitted as part of the bid package.

No contract work shall be performed by a DBE subcontractor until the executed DBE subcontract is approved in writing by DelDOT and the Department has issued the required Notice to Proceed. Any DBE subcontract relating to work to be performed pursuant to this contract, which is submitted to DelDOT for approval, must contain all DBE subcontractor information, the requirements contained in this contract, and must be fully executed by the contractor and DBE subcontractor.

Each contract between the prime contractor and each DBE subcontractor shall at the minimum include the following:

1. All pertinent provisions and requirements of the prime contract.
2. Description of the work to be performed by the DBE subcontractor.
3. The dollar value of each item of work to be completed by the DBE subcontractor and the bid price of each item of work to be completed by the DBE subcontractor.

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CRITICAL DBE REQUIREMENTS

A bid may be held to be non-responsive and not considered if the required DBE information is not provided. In addition, the bidder may lose its bidding capability on Department projects and such other sanctions as the Department may impose. It is critical that the bidder understands:

1. In the event that the bidder cannot meet the DBE goal as set forth in this specification, he/she shall at the time of bid submit to the Department that percentage of the DBE Goal that will be met, if any, on the written and notarized assurance made a part of this contract. The contractor shall also at the time of bid submit all documentation that the contractor wishes to have the Department consider in determining that the contractor made a Good Faith Effort to meet contract DBE Goals. The Department will not accept Good Faith Effort documentation other than on the scheduled date and time of the bid opening. However, the Department may ask for clarification of information submitted should the need arise.
2. A bid which does not contain either a completely executed DBE Program Assurance and/or Good Faith Effort documentation, where appropriate, shall be declared non-responsive and shall not be considered by the Department.
3. Failure of the apparent low bidder to present originals of all DBE subcontracts to substantiate the volume of work to be performed by DBE's as indicated in the bid within five (5) calendar days after the bid opening shall create a rebuttable presumption that the bid is not responsive.
4. Bidders are advised that failure to meet DBE Goals during the term of the contract may subject them to Department sanctions as identified in the DBE Program Plan.

5. In the execution of this contract, the successful bidder agrees to comply with the following contract clauses:

Prompt Payment: The prime contractor/consultant receiving payments shall, within 30 days of receipt of any payment, file a statement with the Department on a form to be determined by the Department that all subcontractors furnishing labor or material have been paid the full sum due them at the stage of the contract, except any funds withheld under the terms of the contract as required by Chapter 8, Title 17 of the Delaware Code, annotated and as amended. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of DeIDOT. This clause applies to both DBE and non-DBE subcontractors.

Retainage: The prime contractor agrees to return retainage to each subcontractor within 15 calendar days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of DeIDOT. This clause covers both DBE and non-DBE subcontractors. As guidance, once a subcontractor has satisfactorily completed the physical work, and has given to the prime contractor a certified statement that all laborers, lower tier contractors, and materialmen who have furnished labor and materials to the subcontractor have been paid all monies due them, the prime contractor shall return retainage to the subcontractor within 15 calendar days.

6. In the execution of this contract, the successful bidder agrees to comply with the following contract assurance and will include this same language in each subcontractor contract:

"The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such remedy as the recipient deems appropriate." 49 CFR Section 26.13

7. In addition to this specification, bidders must comply with all provisions of the rules and regulations adopted by the U.S. Department of Transportation for DBE participation in U.S. DOT and DeIDOT Programs (49 CFR Part 26) and the Delaware Department of Transportation Disadvantaged Business Enterprise Program Plan; each of which is hereby incorporated and made part of this specification. Bidders are also reminded that they must be responsible and responsive bidders in all other aspects aside from the DBE Program in order to be awarded the contract.

8. In accordance with 49 CFR 26.53(f)(1), DeIDOT requires that a prime contractor not terminate a DBE subcontractor without prior written consent from the DeIDOT Civil Rights Office. This includes, but is not limited to, instances in which a prime contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

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GUIDANCE FOR GOOD FAITH EFFORT

When the DBE Goals established for a contract by DeIDOT are not met, the contractor shall demonstrate good faith efforts to meet the DBE contract goals. The contractor shall demonstrate that the efforts made were those that a contractor actively and aggressively seeking to meet the goals established by DeIDOT would make, given all relevant circumstances. Evidence of this good faith effort will be submitted with the bid at the time of the bid opening.

The contractor is expected to demonstrate good faith efforts by actively and aggressively seeking out DBE participation in the project to the maximum extent, given all relevant circumstances. Following are the kinds of efforts that may be taken but are not deemed to be exclusive or exhaustive and DeIDOT will consider other factors and types of efforts that may be relevant:

1. Efforts made to select portions of the work proposed to be performed by DBEs in order to increase the likelihood of achieving the stated goal. Selection of portions of work are required to at least equal the goal for DBE utilization specified in this contract.
2. Written notification at least ten (10) calendar days prior to the opening of a bid soliciting DBE interest in participating in the contract as a subcontractor or supplier and for specific items of work.

3. Efforts made to obtain and negotiate with DBE firms for specific items of work:
 - a. Description of the means by which firms were solicited (i.e. by telephone, e-mail, written notice, advertisement).
 - b. The names, addresses, telephone numbers of DBE's contacted, the dates of initial contact; and whether initial solicitations of interest were followed-up by contacting the DBEs to determine with certainty whether the DBEs were interested.
 - c. A description of the information provided to DBE firms regarding the plans, specifications and estimated quantities for portions of the work to be performed.
 - d. A statement of why additional agreements with DBE's were not reached in order to meet the projected goal.
 - e. Listing of each DBE contacted but not contracted and the reasons for not entering a contract.
4. Efforts made to assist DBEs that need assistance in obtaining bonding, insurance, or lines of credit required by the contractor.
5. Reasons why certified DBEs are not available or not interested.
6. Efforts to effectively use the services of available disadvantaged community organizations; disadvantaged contractor's groups; local, state and federal DBE assistance offices; and other organizations that provide assistance in recruitment and placement of DBEs.

The following are examples of actions that may not be used as justification by the contractor for failure to meet DBE contract goals:

1. Failure to contract with a DBE solely because the DBE was unable to provide performance and/or payment bonds.
2. Rejection of a DBE bid or quotation based on price alone.
3. Rejection of a DBE because of its union or non-union status.
4. Failure to contract with a DBE because the contractor normally would perform all or most of the work in the contract.

Administrative reconsideration:

Within five (5) days of being informed by DelDOT that it is not responsive because it has not documented sufficient good faith efforts, a bidder may request administrative reconsideration. Bidder should make this request in writing to the following reconsideration official: Director of Finance, DelDOT, 800 Bay Road, Dover, Delaware 19901, and Email a copy to dot-ask@delaware.gov. The reconsideration official will not have played any role in the original determination that the bidder did not document sufficient good faith efforts.

As part of this reconsideration, the bidder will have the opportunity to provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so. The bidder will have the opportunity to meet in person with the reconsideration official, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. The final decision made by the reconsideration official will be communicated to the bidder in writing. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

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**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

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

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

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

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

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

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

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

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

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

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

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

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

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

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

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

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

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

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

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

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

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

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

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

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

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

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

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

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

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

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

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

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

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

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

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

2. Withholding

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

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

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

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

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

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

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

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

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

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

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

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

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

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

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

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

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

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

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

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

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

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

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

Shall be fined under this title or imprisoned not more than 5 years or both."

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

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

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

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

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

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

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

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

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

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

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

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

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

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

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

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

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

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

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

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

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

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

this transaction originated may pursue available remedies, including suspension and/or debarment.

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

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

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

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

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

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

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

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

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

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

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

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

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

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

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

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

CARGO PREFERENCE ACT

Requirements in the Federal-aid Highway Program

(a) Agreement Clauses. "Use of United States-flag vessels:

(1) Pursuant to Pub. L. 664 (43 U.S.C. 1241(b)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.

(2) 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 (a)(1) of this section shall be furnished 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.

(b) Contractor and Subcontractor Clauses. "Use of United States-flag vessels: 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 (b) (1) of this section 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.

NOTE:

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

* * * * *

BUY AMERICA

Requirements in the Federal-aid Highway Program

By signing and submitting this proposal, the bidder certifies that:

In accordance with 23 U.S.C, 313 and 23 CFR 635.410, all iron and steel materials permanently incorporated into this project will be produced in the United States and that all manufacturing processes involving these materials will occur in the U.S, except that a minimal amount of foreign steel or iron materials may be used, provided the cost of the foreign materials does not exceed 0.1 percent of the total Contract cost or \$2,500.00, whichever is greater. If such minimal amount of foreign steel is used, the Contractor shall maintain a record of the costs to ensure that the allowable limit is not exceeded. This documentation shall be presented to the Department upon request.

At the Department's request, I/we will provide manufacturer's/supplier's documentation verifying domestic origin as defined in the Specifications. All Materials accepted on the basis of such Certificate of Compliance may be sampled by the Department and tested at any time. Use of Material on the basis of Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating Material in the Project conforming to the requirements of the Contract. Any Material not conforming to such requirements will be subject to rejection whether in place or not. The Department reserves the right to refuse to permit the use of Material on the basis of Certificate of Compliance.

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APPENDICES TO THE TITLE VI ASSURANCE

APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, (Federal Highway Administration (FHWA), or Federal Transit Authority (FTA)), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts and the Regulations, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration (FHWA), or Federal Transit Authority (FTA) to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the Federal Highway Administration (FHWA), or Federal Transit Authority (FTA), as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration (FHWA), or Federal Transit Authority (FTA) may determine to be appropriate, including, but not limited to:
 - withholding payments to the contractor under the contract until the contractor complies;
 - and/or cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through five in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts and the Regulations. The contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration (FHWA), or Federal Transit Authority (FTA) may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX E

During the performance of this contract, the contractor or consultant, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,(42 U.S.C. § 460 I), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);

Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);

Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part27;

The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);

Airport and Airway Improvement Act of 1982,(49 USC §471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);

The Civil Rights Restoration Act of 1987,(PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964,The Age Discrimination Act of 1975and Section 504 of the Rehabilitation Act of 1973,by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);

Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 - 12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;

The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. S 41123) (prohibits discrimination on the basis of race, color, national origin, and sex);

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs; policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

* * * * *

PREVAILING WAGES

Included in this proposal are the minimum wages to be paid various classes of laborers and mechanics as determined by the Department of Labor of the State of Delaware in accordance with Title 29 Del.C. §6960, relating to wages and the regulations implementing that Section.

REQUIREMENT BY DEPARTMENT OF LABOR FOR SWORN PAYROLL INFORMATION

Title 29 Del.C. §6960 stipulates;

- (b) Every contract based upon these specifications shall contain a stipulation that the employer shall pay all mechanics and laborers employed directly upon the site of the work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics. The specifications shall further stipulate that the scale of wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work, and that there may be withheld from the employer so much of accrued payments as may be considered necessary by the Department of Labor to pay to laborers and mechanics employed by the employer the difference between the rates of wages required by the contract to be paid laborers and mechanics on the work and rates of wages received by such laborers and mechanics to be remitted to the Department of Labor for distribution upon resolution of any claims.
- (c) **Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.**

Bidders are specifically directed to note the Department of Labor's prevailing wage regulations implementing §6960 relating to the effective date of the wage rates, at Part VI., Section C., which in relevant part states:

"Public agencies (covered by the provisions of 29 Del.C. §6960) are required to use the rates which are in effect on the date of the publication of specifications for a given project. In the event that a contract is not executed within one hundred twenty (120) days from the date the specifications were published, the rates in effect at the time of the execution of the contract shall be the applicable rates for the project."

PREVAILING WAGE REQUIREMENTS

It is DelDOT's understanding that the Davis-Bacon Act is not a preemptive statute in the broad sense, and does not preempt or displace State of Delaware prevailing wage requirements.

When a contract for a project contains both Federal Davis-Bacon and State of Delaware prevailing wage standards because of concurrent Federal and State coverage, the employer's minimum wage obligations are determined by whichever standards are higher.

Contractors with questions may contact:

Department of Labor, Division of Industrial Affairs, 4425 N. Market Street, Wilmington, DE 19802
Telephone (302) 761-8200

<https://dia.delawareworks.com/labor-law/>

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 761-8200

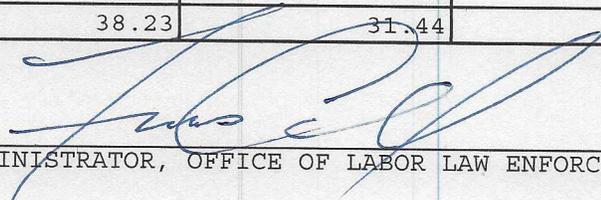
Mailing Address:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

Located at:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

PREVAILING WAGES FOR HIGHWAY CONSTRUCTION EFFECTIVE MARCH 13, 2020

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
BRICKLAYERS	57.94	57.94	57.94
CARPENTERS	57.07	56.46	44.83
CEMENT FINISHERS	59.27	36.35	28.90
ELECTRICAL LINE WORKERS	29.93	48.35	23.66
ELECTRICIANS	72.49	72.49	72.49
IRON WORKERS	72.84	26.57	28.22
LABORERS	46.12	42.45	41.67
MILLWRIGHTS	17.94	17.41	15.03
PAINTERS	73.29	73.29	73.29
PILEDRIVERS	79.62	26.45	30.00
POWER EQUIPMENT OPERATORS	69.07	44.10	40.40
SHEET METAL WORKERS	25.34	22.61	20.48
TRUCK DRIVERS	38.23	31.44	38.30

CERTIFIED: 07/08/2020

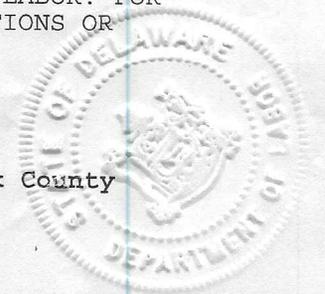
BY: 
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) ~~442-223~~ 761-8200

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: T201907601 BR 3-155N and S on SR1 over Broadkill River, Sussex County



ELECTRICIAN		
Electrician.....	\$ 70.49	0.00
Line Workers.....	\$ 23.24	0.00
IRONWORKER.....	\$ 27.27	0.00
LABORER.....	\$ 40.93	0.00
MILLWRIGHT.....	\$ 14.76	0.00
PAINTER.....	\$ 71.29	0.00
POWER EQUIPMENT OPERATOR		
Piledrivers.....	\$ 29.47	0.00
Power Equipment Operators...	\$ 39.68	0.00
SHEET METAL WORKER.....	\$ 20.12	0.00
TRUCK DRIVER.....	\$ 37.62	0.00

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

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

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

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

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

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

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor

200 Constitution Avenue, N.W.
Washington, DC 20210

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

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

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

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

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

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

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END OF GENERAL DECISION"

SPECIAL PROVISIONS

S.P. Code	SPECIAL PROVISION DESCRIPTION
401502-15	ASPHALT CEMENT COST ADJUSTMENT
401580-15	RIDE QUALITY OF HOT-MIX PAVEMENT
401699-15	QUALITY CONTROL/QUALITY ASSURANCE OF BITUMINOUS CONCRETE
602506-15	CONVERTING EXISTING JUNCTION BOX TO CATCH BASIN
605504-15	FRP JACKET AND EPOXY GROUT PILE ENCASEMENT, 18" ROUND PILE
605511-15	FRP JACKET AND EPOXY GROUT PILE ENCASEMENT, 16" ROUND PILE
610500-15	ULTRA HIGH PERFORMANCE CONCRETE
612504-15	PRECAST APPROACH SLAB PANELS AND SLEEPER SLAB UNITS
615501-15	PREFABRICATED SUPERSTRUCTURE MODULES
615510-15	NAVIGATION LIGHTS FOR FIXED BRIDGES
625501-15	POLYESTER POLYMER CONCRETE OVERLAY INSTALLATION
625502-15	FURNISHING POLYESTER POLYMER CONCRETE OVERLAY
701500-15	PORTLAND CEMENT CONCRETE CURB, TYPE 1, MODIFIED
763501-15	CONSTRUCTION ENGINEERING
763503-15	TRAINEE
763508-15	PROJECT CONTROL SYSTEM DEVELOPMENT PLAN
763509-15	CPM SCHEDULE UPDATES AND/OR REVISED UPDATES
763599-15	FIELD OFFICE, SPECIAL II
850532-15	TEMPORARY LIGHTING

Contract No. T201907601.01

401502 - ASPHALT CEMENT COST ADJUSTMENT

For Sections 304, 401, 402, 403, 404, and 405, payments to the Contractor shall be adjusted to reflect increases or decreases in the Delaware Posted Asphalt Cement Price when compared to the Project Asphalt Cement Base Price, as defined in these Special Provisions.

The Delaware Posted Asphalt Cement Price will be issued monthly by the Department and will be the industry posted price for Asphalt Cement, F.O.B. Philadelphia, Pennsylvania.

The Project Asphalt Cement Base Price will be the anticipated Delaware Posted Asphalt Cement Price expected to be in effect at the time of receipt of bids.

All deviations of the Delaware Posted Asphalt Cement Price from the Project Asphalt Cement Base Price are eligible for cost adjustment. No minimum increases or decreases or corresponding percentages are required to qualify for cost adjustment.

Actual quantity of asphalt cement qualifying for any Asphalt Cement Cost Adjustment will be computed using the weight of eligible asphalt that is shown on the QA/QC pay sheets as a percentage for the delivered material.

If the mix was not inspected and no QA/QC pay sheet was generated, then the asphalt percentage will be obtained from the job mix formula for that mix ID.

The asphalt percentage eligible for cost adjustment shall only be the virgin asphalt cement added to the mix.

There shall be no separate payment per ton cost of asphalt cement. That cost shall be included in the various unit prices bid per ton for those bid items that contain asphalt cement (mentioned above).

The Asphalt cement cost adjustment will be calculated on grade PG 64-22 asphalt regardless of the actual grade of asphalt used. The Project Asphalt Cement Base Price for the project will be \$_____per ton (\$_____ per metric ton).

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If the Contractor exceeds the authorized allotted completion time, the price of asphalt cement on the last authorized allotted work day, shall be the prices used for cost adjustment during the time liquidated damages are assessed. However, if the industry posted price for asphalt cement goes down, the asphalt-cement cost shall be adjusted downward accordingly.

NOTE

Application of Asphalt Cement Cost Adjustment requirements as indicated above shall apply only to those contracts involving items related to bituminous base and pavements, and with bitumen, having a total of 1,000 tons or more of hot-mix bid quantity in case of Sections 401, 402 and 403; and 15,000 gallons or more in case of Sections 304, 404 and 405.

08/07/14

Contract No. T201907601.01

401580 - RIDE QUALITY OF BITUMINOUS PAVEMENT

Description:

This specification outlines requirements for an acceptable ride surface in addition to requirements established in DeDOT Standard Specifications. The Contractor is responsible for providing smoothness characteristics that meet these requirements. The Contractor is responsible for providing equipment, maintenance of traffic (MOT) as required by the Delaware MUTCD, and performing testing in accordance to this specification. All costs for testing and MOT are incidental to this item. Both the International Roughness Index (IRI) and deviations located within a 10' straightedge are used to characterize smoothness in this Special Provision.

Definitions:

Class 1 Project - a project that consists of full depth construction. Full depth construction is considered to be when contract documents or modifications provide opportunity for preparation of the subgrade prior to paving.

Class 2 Project - a project that consists of a minimum of two smoothness opportunities.

Class 3 Project - a project that consists of one smoothness opportunity.

Deviation - a hump or depression that exceeds defined tolerances.

Smoothness Opportunity - a smoothness opportunity is considered to be any of the following; roadway milling, placement of a leveling course, in-place recycling, or placement of a lift of bituminous concrete. The final wearing surface is considered one smoothness opportunity.

Equipment:

The Contractor must have a 10' straightedge available during all paving operations.

The Contractor must also have a high speed or lightweight inertial profiling system that meets requirements of AASHTO M328 capable of collecting data in both wheelpaths simultaneously.

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Prior to the start of corrective actions, the Contractor must provide to the Engineer:

1. Manufacturer, Make, and Model of the test system
2. Equipment Owner,
3. Relevant Certifications,
4. Manufacturer Calibration Procedures, and
5. Relevant Operator Training information.

Testing:

The Contractor is responsible for testing the pavement surface using an approved inertial profiler in accordance to manufacturer and AASHTO R57 from the start of paving limits to the end of pavement limits. Testing must be performed 3 times in each lane paved in the direction of traffic flow. Testing must be performed within seven (7) days of completion of project paving operations in each location.

The Contractor is responsible for providing information relative to locations that are to be excluded from calculation of the International Roughness Index. These areas must still meet 10' straightedge requirements.

Areas that are to be tested but will be removed prior to IRI analysis are:

1. 50 feet prior to the first bridge deck expansion joint and 50 feet after the last expansion joint if a bridge deck is excluded from smoothness operations.
2. 50' longitudinally from the center of an existing obstruction within the test area such as a manhole, water main, or catch basin that impedes paving operations.
3. 50' longitudinally from transverse joints that separate it from existing pavement not included on this contract.

Areas that are not to be profiled but are still subject to 10' straightedge requirements are:

1. Shoulder areas
2. Parking lots
3. Ramps, Streets, or Acceleration / Deceleration lanes less than 1000' in length.

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Submission Requirements:

Test results must be submitted to the Engineer within five working days of completion of testing. Results not received within the allotted time frame will be assessed a charge of \$1,000.00 per day at the discretion of the Engineer. The Contractor is required to submit summary table IRI reports from their test equipment for 1 run for each lane and direction of paving. This report must also include:

1. Profiling Company Name
2. Date of Test
3. Contract Number
4. Location Description
5. Testing Personnel

The Contractor is required to submit ERD files for each of the 3 tests run in each lane and direction of paving to the Engineer for analysis. The Contractor must provide to the Engineer written documentation indicating the start and end of bridges and the center of obstructions relative to the stationing used on the testing that are not subject to IRI analysis.

Acceptance and Payment:

Acceptance of the final pavement will be based on Engineer calculated IRI values using ProVAL software upon removal of allowable areas of exemption and the number of deviations found in the pavement surface. The IRI measurements will be calculated in 0.1 mile (528 foot) sections for payment purposes. The average value of the three test runs will be used and the average value will be rounded to the nearest tenth. Payments for each section will be based on estimated tonnage calculated from plan thickness and widths using the average maximum specific gravity ("Rice") for all surface mix used at that location.

Deviations equal to or in excess of 0.25" in 10' are to be corrected at the Contractor's expense or will have a discount charge of \$200.00 per deviation.

$$\text{Estimated Tonnage} = [L * W * T] * \text{Rice} * 62.4 \text{ (lb/ft}^3\text{)} * (0.0005 \text{ tons} / 12 \text{ in.})$$

Where: L = Length Segment (ft.)

W = Lane Width (ft.)

T = Plan Thickness (in.)

Contract No. T201907601.01

$$IRI \text{ Incentive / Disincentive} = \text{Estimated Tonnage} * UP * (PA-100)/100$$

Where: UP = Contract Unit Price (Dollars)

PA = Pay Adjustment (Table A)

The total pay adjustment for paving work performed on each location is:

$$(\sum IRI \text{ adj for each section}) - \text{Total Deviations} * 200$$

It is possible to receive incentive for IRI measurements and a discount charge for excessive deviations on the same project. If a 528' section has an IRI value resulting in a deduction of at least 84% of the section pay, the deviation discount charge for that section is disregarded and the IRI discount charge is the only action taken for that section.

Table A: Payment Adjustments for IRI	
Class 1	
IRI per 0.1 mile Segment (in./mi.)	Pay Adjustment
≤ 50	103%
> 50 and < 145	100+ 0.2(65- IRI)
≥ 145	84%
Class 2	
IRI per 0.1 mile Segment (in./mi.)	Pay Adjustment
≤ 60	106%
> 60 and < 170	100+ 0.2(90- IRI)
≥ 170	84%

Correction to the paving surface, such as diamond grinding with approved equipment, patching, or other measures may be taken at the Contractor's expense and at the Engineers discretion to correct pavement surfaces

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assessed a discount charge. The Engineer may require corrective actions including remove & replace if the deviation discount charge exceeds 50% of the cost of materials or the IRI pay adjustment is 84%. Deviations must be corrected if it is determined that they are at a height or depth that may create a safety concern.

4/10/2019

401699 - QUALITY CONTROL/QUALITY ASSURANCE OF BITUMINOUS CONCRETE

.01 Description

This item shall govern the Quality Assurance Testing for supplying bituminous asphalt plant materials and constructing bituminous asphalt pavements and the calculation for incentives and disincentives for materials and construction. The Engineer will evaluate all materials and construction for acceptance. The procedures for acceptance are described in this Section. Include the costs for all materials, labor, equipment, tools, and incidentals necessary to meet the requirements of this specification in the bid price per ton for the bituminous asphalt. Payment to the Contractor for the bituminous asphalt item(s) will be based on the Contract price per ton and the pay adjustments described in this specification.

.02 Bituminous Concrete Production – Quality Acceptance

(a) Material Production - Tests and Evaluations.

All acceptance tests shall be performed by qualified technicians at qualified laboratories following AASHTO or DeIDOT procedures, and shall be evaluated using Quality Level Analysis. The Engineer will conduct acceptance tests. The Engineer will directly base acceptance on the acceptance test results, the asphalt cement quality, the Contractor's QC Plan work, and the comparisons of the acceptance test results to the QC test results. The Engineer may elect to utilize test results of the Contractor in some situations toward judging acceptance.

Supply and capture samples, as directed by the Engineer under the purview of the Engineer from delivery trucks before the trucks leave the production plant. Hand samples to the Engineer to be marked accordingly. The sample shall represent the material produced by the Contractor, and shall be of sufficient size to allow the Engineer to complete all required acceptance tests. The Engineer will direct the Contractor when to capture these samples, on a statistically random, unbiased basis, established before production begins each day based upon the anticipated production tonnage. The captured sample shall be from the Engineer specified delivery truck. The Contractor may visually inspect the specified delivery load during sampling and elect to reject the load. If the contractor elects to reject the specified delivery truck, each subsequent load will be inspected until a visually acceptable load is produced for acceptance testing. All visually rejected loads shall not be sent to a Department project.

The first sample of the production day will be randomly generated by the Engineer between loads 0 and 12 (0-250 tons). Subsequent samples will be randomly generated by the Engineer on 500-ton sub-lots for the production day. Samples not retrieved in accordance with the Contractor's QC plan will be deemed unacceptable and may be a basis for rejection of material produced. Parallel tests or dispute resolution tests will only be performed on material captured at the same time and location as the acceptance test sample. Parallel test samples

Contract No. T201907601.01

or Dispute Resolution samples will be created by splitting a large sample or obtaining multiple samples that equally represent the material. The Engineer will perform all splitting and handling of material after it is obtained by the Contractor.

The Contractor may retain dispute resolution samples or perform parallel tests with the Engineer on any acceptance sample.

The Engineer will evaluate and accept the material on a lot basis. All the material within a lot shall have the same JMF (mixture ID). The lot size shall be targeted for 2000 tons or a maximum period of three days, whichever is reached first. If the 2000th ton target lot size is achieved during a production day, the lot size shall extend to the end of that production day. The Contractor may interrupt the production of one JMF in order to produce different material; this type of interruption will not alter the determination of the size or limits of material represented by a lot. The Engineer will evaluate each lot on a subplot basis. The size for each subplot shall be 100 to 500 tons and testing for the sub lots will be completed on a daily basis. For each subplot, the Engineer will evaluate one sample.

The target size of sub-lots within each lot, except for the first sample of the production day, is equal-sized 500 ton sub lots and will be based upon anticipated production, however, more or fewer sublots, with differing sizes, may result due to the production schedule and conditions. If the actual production is less than anticipated, and it's determined a sample will not be obtained (based upon the anticipated tonnage), a new sample location will be determined on a statistically random, unbiased basis based upon the new actual production. If the actual production is going to be 50 tons or greater over the anticipated sub lot production, a new sample location will be determined on a statistically random, unbiased basis based upon the new actual production. The Engineer will combine the evaluation and test results for all of the applicable sublots in order to evaluate each individual lot.

If the Engineer is present, and the quantity exceeds 25 tons, a statistically random sample will be used for analysis. When the anticipated production is less than 100 tons and greater than 25 tons, and the Engineer is not present, the contractor shall randomly select a sample using the Engineer's random location program. The captured sample shall be placed in a suitable box, marked to the attention of the Engineer, and submitted to the Engineer for testing. A box sample shall also be obtained by the contractor at the same time and will be used as the Dispute Resolution sample if requested by the Engineer. The Contractor shall also obtain one liquid asphalt sample (1 pint) per grade of asphalt used per day and properly label it with all pertinent information.

The Engineer will conduct the following tests in order to characterize the material for the pavement compaction quality and to judge acceptance and the pay adjustment for the material:

- AASHTO T312 - Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
- AASHTO T166, Method C (Rapid Method) - Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface Dry Specimens

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- AASHTO T308 - Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method
- AASHTO T30 - Mechanical Analysis of Extracted Aggregate
- AASHTO T209 - Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt (HMA)
- ASTM D7227 - Standard Practice for Rapid Drying of Compacted Asphalt Specimens using Vacuum Drying Apparatus

(b) Pavement Construction - Tests and Evaluations.

The Engineer will directly base acceptance on the compaction acceptance test results, and on the inspection of the construction, the Contractor's QC Plan work, ride smoothness as referenced in the contract documents, lift thickness as referenced in the contract documents, joint quality as referenced in the contract documents, surface texture as referenced in the contract documents, and possibly the comparisons of the acceptance test results to the independent test results. For the compaction acceptance testing, the Engineer will sample the work on a statistically random basis, and will test and evaluate the work based on daily production.

Notify the Engineer of any locations within that road segment that may not be suitable to achieve minimum (93%) compaction due to existing conditions prior to paving the road segment. Schedule and hold a meeting in the field with the Engineer in order to discuss all areas that may potentially be applicable to Table 5a before paving starts. Areas that will be considered for Table 5a will be investigated in accordance to the method described in Appendix B. If this meeting is not held prior to paving, no areas will be considered for Table 5a. Areas of allowable exemptions that will not be cored include the following: partial-depth patch areas, driveway entrances, paving locations of less than 100 tons, areas around manholes and driveway entrances, and areas of paving that are under 400 feet in continuous total length and/or 5 feet in width.

The exempt areas around manholes will be a maximum of 4 feet transversely on either side from the center of the manhole, and 20 feet longitudinally on either side from the center of the manhole. The exempt areas around driveway entrances shall be the entire width of the driveway, and 3 feet from the edge of the longitudinal joint next to the driveway. Areas of exemption that will be cored for informational purposes only include: areas where the mat thickness is less than three times the nominal maximum aggregate size as directed by the Engineer, violations of Section 401.08 in the Standard Specifications as directed by the Engineer, and areas shown to contain questionable subgrade properties as proven by substantial yielding under a fully legally loaded truck. Failure to obtain core samples in these areas will result in zero payment for compaction regardless of the exempt status.

The Engineer will evaluate and accept the compaction work on a daily basis. Payment for the compaction will be calculated by using the material production lots as referenced in **.02 Acceptance Plan (a) Material Production - B Tests and Evaluation** and analyzing the compaction results over the individual days covered in the material production lot. The compaction results will be combined with the material results to obtain a payment for this item.

Contract No. T201907601.01

The minimum size of a compaction lot shall be 100 tons. If the compaction lot is between 101 and 1000 tons, the Engineer shall randomly determine four compaction acceptance test locations. If the compaction lot is between 1001 and 1500 tons, the Engineer shall randomly determine six compaction acceptance test locations. If the compaction lot is between 1501 and 2000 tons, the Engineer shall randomly determine eight compaction acceptance test locations. If the compaction lot is greater than 2000 tons, the Engineer shall randomly determine two compaction acceptance test locations per 500 tons.

If a randomly selected area falls within an Engineer approved exemption area, the Engineer will select one more randomly generated location to be tested per the requirements of this Specification. If that cannot be accomplished, or if an entire location has been declared exempt, the compaction testing shall be performed as per these Specifications but a note will be added to the results that the location was an Engineer approved exempt location.

Testing locations will be a minimum of 1.0 feet from the newly placed longitudinal joint and 50 feet from a new transverse joint.

Cut one six (6) inch diameter core through the full lift depth at the exact location marked by the Engineer. Cores submitted that are not from the location designated by the Engineer will not be tested and will be paid at zero pay.

Notify the Engineer prior to starting paving operations with approximate tonnage to be placed. The Contractor is then responsible for notifying the appropriate Engineer test personnel within 12 hours of material placement. The Engineer will mark core locations within 24 hours of notification. After determination of locations, the Contractor shall complete testing within two operational days of the locations being marked. If the cores are not cut within two operational days, the area in question will be paid at zero pay for compaction testing.

Provide any traffic control required for the structural number investigation, sampling, and testing work at no additional cost to the Department.

Commence coring of the pavement after the pavement has cooled to a temperature of 140°F or less. Cut each core with care in order to prevent damaging the core. Damaged cores will not be tested. Label each core with contract number, date of construction, and number XX of XX upon removal from the roadway. Place cores in a 6-inch diameter plastic concrete cylinder mold or approved substitute for protection. Separate cores in the same cylinder mold with paper. Attach a completed QC test record for the represented area with the corresponding cores. The Engineer will also complete a test record for areas tested for the QA report and provide to Materials & Research. Deliver the cores to the Engineer for testing, processing, and report distribution at the end of each production day.

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Repair core holes per Appendix A, Repairing Core Holes in Bituminous Asphalt Pavements. Core holes shall be filled immediately. Failure to repair core holes at the time of coring will result in zero pay for compaction testing for the area in question.

The Engineer will conduct the following tests on the applicable portion of the cores in order to evaluate their quality:

- AASHTO T166, Method C (Rapid Method) B Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface Dry Specimens
- AASHTO T209 - Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt
- ASTM D7227 - Standard Practice for Rapid Drying of Compacted Asphalt Specimens using Vacuum Drying Apparatus

The Engineer will use the average of the last five test values of the same JMF (mixture ID) material at the production plant in order to calculate the average theoretical maximum specific gravity of the cores. The average will be based on the production days test results and as many test results needed from previous days production to have an average of five samples. If there are less than five values available, the Engineer will use the JMF design value in addition to the available values to calculate the average theoretical maximum specific gravity.

.03 Payment and Pay Adjustment Factors.

The Engineer will determine pay adjustments for the bituminous asphalt item(s) in accordance with this specification. The Engineer will determine a pay adjustment factor for the material produced and a pay adjustment factor for the pavement construction. Pay adjustments for material and construction will be calculated independently. When the pay adjustment calculation for either material or construction falls to zero payment per tables 4, 5, or 5a, the maximum pay adjustment for the other factor will not exceed 100.

Pay Adjustment factors will only be calculated on in place material. Removed material will not be used in payment adjustment calculations.

Material Production Pay Adjustments will be calculated based upon 70% of the contract unit price and calculated according to section .03(a) of this specification. Pavement construction Pay Adjustments will be calculated based upon 30% of the contract unit price and calculated according to section .03(b) of this specification.

(a) Material Production - Pay Adjustment.

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Calculate the material pay adjustment by evaluating the production material based on the following parameters:

Table 2 - Material Parameter Weight Factors		
Material Parameter	Single Test Tolerance (+/-)	Weight Factor
Asphalt Content	0.4	0.30
#8 Sieve (>=19.0 mm)	7.0	0.30
#8 Sieve (<=12.5 mm)	5.0	0.30
#200 Sieve (0.075mm Sieve)	2.0	0.30
Air Voids (4.0% Target)	2.0	0.10

Using the JMF target value, the single test tolerance (from Table 2), and the test values, the Engineer will use the following steps to determine the material pay adjustment factor for each lot of material:

1. For each parameter, calculate the mean value and the standard deviation of the test values for the lot to the nearest 0.1 unit.
2. For each parameter, calculate the Upper Quality Index (QU):
$$QU = ((JMF \text{ target}) + (\text{single test tolerance}) - (\text{mean value})) / (\text{standard deviation}).$$
3. For each parameter, calculate the Lower Quality Index (QL):
$$QL = ((\text{mean value}) - (JMF \text{ target}) + (\text{single test tolerance})) / (\text{standard deviation}).$$
4. For each parameter, locate the values for the Upper Payment Limit (PU) and the Lower Payment Limit (PL) from Table 3 - Quality Level Analysis by the Standard Deviation Method. (Use the column for "n" representing the number of sublots in the lot. Use the closest value on the table when the exact value is not listed).
5. Calculate the PWL for each parameter from the values located in the previous step:
$$PWL = PU + PL - 100.$$
6. Calculate each parameter's contribution to the payment adjustment by multiplying its PWL by the weight factor shown in Table 2 for that parameter.

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7. Add the calculated adjustments of all the parameters together to determine the Composite PWL for the lot.
8. From Table 4, locate the value of the Pay Adjustment Factor corresponding to the calculated PWL. When all properties of a single test are within the single test tolerance of Table 2, Pay Adjustment factors shall be determined by Column B. When any property of a single test is outside of the Single Test Tolerance parameters defined in Table 2, the Material Pay Adjustment factor shall be determined by Column C
9. For each lot, determine the final material price adjustment:

Final Material Pay Adjustment =

(Lot Quantity) x (Item Bid Price) x (Pay Adjustment Factor) x 70%. This final pay calculation will be paid to the cent.

In lieu of being assessed a pay adjustment penalty, the Contractor may choose to remove and replace the material at no additional cost to the Department. When the PWL of any material parameter in Table 2 is below 60, the Engineer may require the removal and replacement of the material at no additional cost to the Department. Test results on removed material shall not be used in calculation of future PWL calculations for Mixture ID.

The test results from the Engineer on production that is less than 100 tons will be combined with the two most recently completed Engineer tests with the same Mixture ID to calculate payment for the lot encompassing the single test. If that cannot be accomplished, the approved JMF will be used to calculate payment for the lot encompassing the single test. Payment for previously closed lots will not be affected by the analysis.

When a sample is outside of the allowable single test tolerance for any Materials criteria in Table 2, that sample will be isolated. For payment purposes, the test result of the out of acceptable tolerance sample will be combined with the two previous acceptable samples of the same JMF and analyzed per this specification. The material that is considered out of the acceptable tolerance will only include the material within the represented sub-lot (i.e., a maximum of 500 tons). If the previous acceptable test result is from the previous production day, only the material produced on the second production day will be considered out of tolerance. All future sub lots will not include the isolated test. The pay factors for the out of tolerance sample lot will be calculated using column C of table 4.

If, during production, a QA sample test result does not meet the acceptable tolerances and the Contractors QC sample duplicates the QA sample test result, the Contractor can make an appropriate change to the mixture (within the JMF boundaries), and request to have that sample further isolated. After the Contractor has made appropriate changes, the Contractor will visually inspect each produced load. The first visually acceptable load will be sampled and tested. If that sample test result shows compliance with the specifications, the material that is considered out of the acceptable tolerance will include the material from the previous acceptable test result to the third load after the initially sampled and tested sample. If the sample does not meet the specification requirements,

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the Engineer will no longer accept material. Production may resume when changes have been made and an acceptable sample and test result is obtained.

Table 3 B Quality Level Analysis by the Standard Deviation Method							
PU or PL	QU and QL for An@ Samples						
	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8	n = 9
100	1.16	1.50	1.79	2.03	2.23	2.39	2.53
99	-	1.47	1.67	1.80	1.89	1.95	2.00
98	1.15	1.44	1.60	1.70	1.76	1.81	1.84
97	-	1.41	1.54	1.62	1.67	1.70	1.72
96	1.14	1.38	1.49	1.55	1.59	1.61	1.63
95	-	1.35	1.44	1.49	1.52	1.54	1.55
94	1.13	1.32	1.39	1.43	1.46	1.47	1.48
93	-	1.29	1.35	1.38	1.40	1.41	1.42
92	1.12	1.26	1.31	1.33	1.35	1.36	1.36
91	1.11	1.23	1.27	1.29	1.30	1.30	1.31
90	1.10	1.20	1.23	1.24	1.25	1.25	1.26
89	1.09	1.17	1.19	1.20	1.20	1.21	1.21
88	1.07	1.14	1.15	1.16	1.16	1.16	1.17
87	1.06	1.11	1.12	1.12	1.12	1.12	1.12

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86	1.04	1.08	1.08	1.08	1.08	1.08	1.08
85	1.03	1.05	1.05	1.04	1.04	1.04	1.04
84	1.01	1.02	1.01	1.01	1.00	1.00	1.00
83	1.00	0.99	0.98	0.97	0.97	0.96	0.96
82	0.97	0.96	0.95	0.94	0.93	0.93	0.93
81	0.96	0.93	0.91	0.90	0.90	0.89	0.89
80	0.93	0.90	0.88	0.87	0.86	0.86	0.86
79	0.91	0.87	0.85	0.84	0.83	0.82	0.82
78	0.89	0.84	0.82	0.80	0.80	0.79	0.79
77	0.87	0.81	0.78	0.77	0.76	0.76	0.76
76	0.84	0.78	0.75	0.74	0.73	0.73	0.72
75	0.82	0.75	0.72	0.71	0.70	0.70	0.69
74	0.79	0.72	0.69	0.68	0.67	0.66	0.66
73	0.75	0.69	0.66	0.65	0.64	0.63	0.63
72	0.74	0.66	0.63	0.62	0.61	0.60	0.60
71	0.71	0.63	0.60	0.59	0.58	0.57	0.57
70	0.68	0.60	0.57	0.56	0.55	0.55	0.54
69	0.65	0.57	0.54	0.53	0.52	0.52	0.51

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68	0.62	0.54	0.51	0.50	0.49	0.49	0.48
67	0.59	0.51	0.47	0.47	0.46	0.46	0.46
66	0.56	0.48	0.45	0.44	0.44	0.43	0.43
65	0.52	0.45	0.43	0.41	0.41	0.40	0.40
64	0.49	0.42	0.40	0.39	0.38	0.38	0.37
63	0.46	0.39	0.37	0.36	0.35	0.35	0.35
62	0.43	0.36	0.34	0.33	0.32	0.32	0.32

Table 3 B Quality Level Analysis by the Standard Deviation Method

QU and QL for An@ Samples							
PU or PL	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8	n = 9
61	0.39	0.33	0.31	0.30	0.30	0.29	0.29
60	0.36	0.30	0.28	0.27	0.27	0.27	0.26
59	0.32	0.27	0.25	0.25	0.24	0.24	0.24

Table 4 - PWL Pay Adjustment Factors

PWL	Pay Adjustment Factor (%) Column B	Pay Adjustment Factor (%) Column C
100	+5	0
99	+4	-1

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98	+3	-2
97	+2	-3
96	+1	-4
95	0	-5
94	-1	-6
93	-2	-7
92	-3	-8
91	-4	-9
PWL<91	PWL - 100	PWL - 100

(b) Pavement Construction - Pay Adjustments.

The Engineer will determine the pavement construction pay adjustment by evaluating the construction of the pavement, based on the following parameter:

- Degree of compaction of the in-place material

Using the test values for the cores, the Engineer will use the following steps to determine the pavement construction pay adjustment for each lot of work.

1. Calculate the core bulk specific gravity values from the subplot tests values, to the nearest 0.001 unit. Obtain the Theoretical maximum Specific Gravity values from the corresponding laboratory subplot tests.

2. Calculate the Degree of Compaction:

Degree of Compaction =

$((\text{Core Bulk Specific Gravity}) / (\text{Theoretical Maximum Specific Gravity})) \times 100\%$ recorded to the nearest 0.1%.

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3. The average compaction for the sublots shall be averaged together for the compaction level of the lot. The lots compaction test level shall be averaged and recorded to the nearest whole percent.
4. Locate the value of the Payment Adjustment Factor corresponding to the calculated degree of compaction from Table 5 or Table 5a.
5. Determine the pavement construction price adjustment by using the following formula:

$$\text{Construction Pay adjustment} = (\text{Lot Quantity}) \times (\text{Bid Price}) \times (\text{Pay Adjustment Factor}) \times 30\%.$$

Table 5: Compaction Price Adjustment Highway Locations		
Degree of Compaction (%)	Range	Pay Adjustment Factor (%)
>= 97.0	>= 96.75	-100*
96.5	96.26 – 96.74	-5
96.0	95.75 – 96.25	-3
95.5	95.26 – 95.74	-2
95.0	94.75 – 95.25	0
94.5	94.26 – 94.74	0
94.0	93.75 – 94.25	1
93.5	93.26 – 93.74	3
93.0	92.75 – 93.25	5
92.5	92.26 – 92.74	3
92.0	91.75 – 92.25	0
91.5	91.26 – 91.74	0
91.0	90.75 – 91.25	-5
90.5	90.26 – 90.74	-15
90.0	89.75 – 90.25	-20
89.5	89.26 – 89.74	-25
89.0	88.75 – 89.25	-30
88.5	88.26 – 88.74	-50
=<88.0	=<88.25	-100*

* or remove and replace it at Engineer's discretion

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Table 5A: Compaction Price Adjustment Other¹ Locations		
Degree of Compaction	Range	Pay Adjustment Factor (%)
>= 97.0	>= 96.75	-100*
96.5	96.26 – 96.74	-5
96.0	95.75 – 96.25	-3
95.5	95.26 – 95.74	-2
95.0	94.75 – 95.25	0
94.5	94.26 – 94.74	0
94.0	93.75 – 94.25	0
93.5	93.26 – 93.74	1
93.0	92.75 – 93.25	3
92.5	92.26 – 92.74	1
92.0	91.75 – 92.25	0
91.5	91.26 – 91.74	0
91.0	90.75 – 91.25	0
90.5	90.26 – 90.74	0
90.0	89.75 – 90.25	0
89.5	89.26 – 89.74	0
89.0	88.75 – 89.25	-1
88.5	88.26 – 88.74	-3
88.0	87.75 – 88.25	-5
87.5	87.26 – 87.74	-10
87.0	86.75 – 87.25	-15
86.5	86.26 – 86.74	-20
86.0	85.75 – 86.25	-25
85.5	85.26 – 85.74	-30
85.0	84.75 – 85.25	-40
84.5	84.26 – 84.74	-50
=< 84.0	=<84.25	-100*

* or remove and replace at Engineer's discretion

¹ This chart is to be used for areas where the structural value of the area to be paved is less than 1.75 as determined by the Engineer. See Appendix B - Method for Obtaining Cores for Determination of Roadway Structure. This chart is applicable to rehabilitation work only; full depth construction will not be considered for Table 5a.

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.04 Dispute Resolution.

Disputes or questions about any test result shall be brought to the attention of the Contractor and the Engineer within two operational days of reported test results. The following dispute resolution procedures will be used.

The Engineer and the Contractor will review the sample quality, the test method, the laboratory equipment, and the laboratory technician. If these factors are not the cause of the dispute, a third party dispute resolution will be used.

Third party resolution testing can be performed at either another Contractor's laboratory, the Engineer's laboratory, or an independent accredited laboratory. Unless otherwise mutually agreed upon by DAPA and the Engineer, the Engineer's qualified laboratory in Dover and qualified personnel shall conduct the necessary testing for third party Dispute Resolution after the Engineer has provided reasonable notice to allow the Contractor to witness this testing.

When disputes over production testing occur, the samples used for Dispute Resolution testing will be those samples the properly captured, labeled, and stored, as described in the second paragraph of the section of these specifications titled **.02 Acceptance Plan, (a) Material Production - Tests and Evaluations**. If no samples are available, the original testing results will be used for payment calculations.

Dispute Resolution samples for air void content will be heated by a microwave oven.

If there is a discrepancy between the Engineer's acceptance test result and the Contractor's test result, the Contractor may ask for the Dispute Resolution sample to be tested. The Contractor may request up to two dispute resolution samples be tested per calendar year without charge. Any additional Dispute Resolution samples run at the Contractor's request where the results substantiate the acceptance test result will be assessed a fee of \$125. Any additional Dispute Resolution samples that substantiate the Contractor's test result will not be assessed the fee.

When disputes over compaction core test results occur, the Engineer's acceptance core will be used for the dispute resolution sample. The Contractor will be advised on when the testing will occur as referenced above to witness the testing.

The results of the dispute resolution testing shall replace all of the applicable disputed test results for payment purposes.

Appendix A - Repairing Core Holes in Bituminous Asphalt Pavement

Description.

This appendix describes the procedure required to repair core holes in a bituminous concrete pavement.

Materials and Equipment.

The following material shall be available to complete this work:

- Patch Material - DeIDOT approved High Performance Cold Patch material shall be used.

The following equipment shall be available to complete this work:

- Sponge or other absorbent material - Used to extract water from the hole.
- Compaction Hammer - mechanical (electrical, pneumatic, or gasoline driven) tamping device with a flat, circular tamping face smaller than 6 inches in diameter.

Construction Method.

After core removal from the hole, remove all excess water from within the hole, and prevent water from re-entering the hole.

Place the patch material in lifts no greater than 3 inches and compact with mechanical tamping device. If the hole is deeper than 3 inches, use two lifts of approximately equal depths so that optimum compaction is achieved. Make sure that the patch surface matches the grade of the existing roadway. Make every effort to achieve the greatest possible compaction

Performance Requirements.

The Engineer will judge the patch on the following basis:

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- The patch shall be well compacted
- The patch surface shall match the grade of the surrounding roadway surface.

Basis of Payment.

No measurement or payment will be made for the patching work. The Contractor must gain the Engineer's acceptance of the patching work before the Engineer will accept the material represented by the core.

Appendix B - Method for Obtaining Cores for Determination of Roadway Structure

The Contractor is responsible for obtaining cores in areas that they propose are eligible for compaction price adjustments according to Table 5a in this specification. Table 5a is not applicable for new full-depth pavement box construction. Cores submitted for this process shall be obtained according to the following process.

1. Contact Materials & Research (M&R) personnel to determine if information about the area is already available. If M&R has already obtained cores in the location that is being investigated, the contractor may opt to use the laboratory information for the investigation and not core the area on their own.
2. If M&R does not have information concerning the section of the roadway, the contractor needs to contact M&R to arrange for verification of coring operations. Arrangements shall be made to allow for an individual from M&R to be on the site when the cores are obtained. Cores will be turned over to M&R for evaluation.
3. The Contractor is responsible for providing all traffic control and repairing core holes in accordance to 401699 Appendix A - Repairing Core Holes in Bituminous Asphalt Pavements.
4. Cores are to be taken throughout the entire project for the area in question. Cores will be spaced, from the start of the project in increments determined based on field and project specifics. Cores will be evenly distributed throughout the project location. The cores will be taken in the center of the lane in question.
5. Additional cores may be taken at other locations, if surface conditions indicate that there may be a substantial difference in the underlying section. The location of these cores should be documented and submitted to M&R.

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6. Cores shall be full depth and include underlying materials. If there is a stone base included in the pavement section, at a minimum 1 core must have information concerning the thickness of the base. This is determined by augering to the subgrade surface.

7. The calculations used to determine the structural capacity of the roadway is as follows. If the contractor finds, upon starting the coring process, that the areas are of greater thickness than applicable to Table 5a, they may terminate the coring process on their own and retract the request.

Structural Number Calculations

Each pavement box material is assigned a structural coefficient based upon AASHTO design guides. The structural coefficient is used to determine the total strength of the pavement section.

Materials used in older pavement sections are assigned lower structural coefficients to compensate for aging of the materials. The coefficients used to determine the structural number of an existing pavement are:

Existing Material	Structural Coefficient
HMA	0.32
Asphalt Treated Base	0.26
Soil Cement	0.16
Surface Treatment (Tar & Chip)	0.10
GABC	0.14
Concrete	0 - 0.7*

* The Structural Coefficient of Concrete is dependent upon the condition of the concrete. Compressive strengths & ASR analysis are used to determine condition - contact the Engineer if this situation arises.

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For the Type C lift the calculation would be:

Newly Placed B	$2.25 * 0.4$	=	0.90
Existing HMA	$2 * 0.32$	=	0.64
GABC	$7 * 0.14$	=	0.98
			<u>2.52</u>

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602506 - CONVERTING EXISTING JUNCTION BOX TO CATCH BASIN

Description:

This work consist of furnishing all materials and constructing a catch basin from an existing junction box in accordance with the locations, notes and details shown on the Plans, and as directed by the Engineer.

Materials and Construction Methods:

Materials and construction methods shall conform to the applicable requirements of Section 602 of the Standard Specifications, and as specified on the Plans.

Portland Cement Concrete shall meet the requirements of Class B, Section 1022 of the Standard Specifications.

Method of Measurement:

The quantity of junction boxes converted to catch basins will be measured as the number of junction boxes converted to catch basins and accepted.

Basis of Payment:

The quantity of junction boxes converted to catch basins will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for constructing the catch basins from the existing junction box, for all materials including reinforcing steel, frames & grates, cover slabs, top units and for all labor, equipment, tools, and incidentals necessary to complete the item. The cost for salvaging shall be included in the unit price bid for the item.

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605504 - FRP JACKET AND EPOXY GROUT PILE ENCASEMENT, 18" ROUND PILE

605511 - FRP JACKET AND EPOXY GROUT PILE ENCASEMENT, 16" ROUND PILE

Description:

This work consists of furnishing all materials and constructing a protective pile encasement. The encasement shall consist of a fiber reinforced plastic (FRP) outer jacket with the space between the jacket and pile filled with a pourable epoxy grout.

NOTE:

If piles to be encased were coated with coal tar epoxy when originally installed, cleaning the piles will require special attention as noted under Construction Methods.

Materials:

1. Jackets - The FRP jackets shall have interlocking joints. The jackets shall be fabricated from fiberglass and polyester resins and shall be a minimum thickness of 1/8 inch, unless otherwise shown on the Plans. The inside face of the jacket shall be textured similar to a sandblasted surface and the surface shall have no bond-inhibiting agents that will come into contact with the epoxy grout. The jackets shall be provided with non-corrosive standoffs, which will maintain the jackets in the required positions (away from the face of the pile) to provide the specified void. The jacket shall be capable of being opened, placed around a pile and then returned to its original shape without damaging the jacket. Compressible sealing strips shall be installed at the bottoms of the jackets to seal the annular space between the pile and the jacket.

The jacket shall meet the following physical-characteristics:

- (a) Water Absorption (ASTM D570) 1% Max.
- (b) Ultimate Tensile Strength (ASTM D638)
Longitudinal, transverse and diagonal . .15,000 psi Min.
- (c) Flexural Strength (ASTM D796) 25,000 psi Min.
- (d) Flexural Modulus of Elasticity
(ASTM D7790) 700,000 psi Min.

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(e) Barcol Hardness (ASTM D2583) 45 ± 5

(f) Color Grey or Brown as

*noted in the Plans

2. Pourable Epoxy Grout - The epoxy grout shall be a 100% solids pourable epoxy grout. The epoxy grout shall consist of an epoxy binder and epoxy extender as follows:

Binder - The binder shall be a two (2) component 2:1 ratio 100% solids pourable epoxy material. It shall be moisture insensitive for application both above and below water and it shall adhere to wet wood, steel, concrete and the FRP jacket.

Epoxy Extender - The filler shall be an epoxy extender compatible with and supplied by the manufacturer of the epoxy.

Mixing - The binder shall be mechanically mixed in strict accordance with manufacturer's instructions. One 3 gallon unit of the mixed binder shall be combined with the designated volume of epoxy extender to achieve the following consistencies:

Pourable. .(3) gallons (11.36 liters) epoxy plus (3) - 48# bags epoxy extender

Mortar Strength - When mixed on a ratio of one part binder to one part epoxy extender, 2 inch cubes of this material at seven (7) days [curing at 66°F to 74°F] shall be 8,000 psi when tested according to ASTM C 109 Modified.

3. Trowelable Epoxy Mortar - The trowel grade epoxy shall be composed of 100% solids trowel grade epoxy binder and epoxy extender as follows:

Binder - The binder shall be a two (2) component 2:1 ratio trowel grade epoxy material. It shall be moisture insensitive for application both above and below water. It shall adhere to wet concrete, steel and the FRP jacket.

Epoxy Extender - The epoxy extender shall be an epoxy extender compatible with and supplied by the manufacturer of the epoxy.

Mixing - The binder shall be machine mixed in strict accordance with manufacturer's instructions. One part of binder shall be combined with a maximum of one part of epoxy extender.

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Mortar Strength - When mixed on a ratio of one part binder to one part filler, 2 inch cubes of this material at seven (7) days [curing at 60°F to 74°F] shall be 8,000 psi when tested according to ASTM C 109 Modified.

All materials shall be compatible and shall be supplied from a single source.

Construction Methods:

Shop drawings, showing location of stand-off spacers, method of fastening jacket form to piling, sealing the jacket after installation and bracing during placement of materials in the annular space between the jacket and the pile, shall be prepared by the Contractor and submitted for approval prior to any field installations.

The surface of the piles shall be cleaned to remove all marine growth, loose rust, scale and old loose coating. Existing tight coating does not require removing. Any sharp edges or metal burrs must be removed. If present, coal tar epoxy coating is classified as a hazardous waste under the USEPA Comprehensive Environmental Response, Compensation and Liability Act.

The Contractor shall submit, for approval, a method for cleaning the piles (as per manufacturer's recommendations) and for the collection and proper disposal of all material removed. If coal tar epoxy is present, include in the submitted method the disposal facility to be used. Cleaning the piles may be done under wet or dry conditions. If under wet conditions, the area must be contained to collect all removed materials. Under dry conditions, all removed materials shall be collected prior to entering the stream or soil.

Disposal of all coal tar epoxy waste shall be in accordance with Federal, state and local regulations including but not limited to:

DRGHW

Delaware Regulations Governing Hazardous Waste

40 CFR Part 261	Identification and Listing of Hazardous Waste
40 CFR Part 262	Standards Applicable to Generators of Hazardous Waste
40 CFR Part 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
29 CFR Part 1910	Occupational Safety and Health Regulations
20 CFR Part 1926	Safety and Health regulations for Construction

To dispose of hazardous waste, the Contractor shall obtain a hazardous waste generator identification number from DNREC Hazardous Waste Management Branch. When disposing of hazardous waste, the Contractor is responsible for preparing all notification and shipping/disposal manifests including, but not limited to, submittal of EPA Form 8700-12, Notification of Regulated Waste Activity to DNREC Hazardous Waste Management Branch.

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The pile jacket shall be spread open by disengaging the interlocking joint. Then placed in position around the pile and fitted together and the bottom of the jacket form shall be sealed against the pile surface. Filling of the annular void between the pile and the pile jacket shall be done in accordance with the material manufacturer's instructions. External bracing materials shall be removed after completion of the work and the exterior surfaces of the jackets shall be cleaned of any filler material or other extraneous material deposited on the pile jackets. Around the top of the jacket a bevel shall be constructed with the trowel grade epoxy mortar to prevent water from ponding on the pile jacket tops.

Method of Measurement:

The quantity of FRP jacket and epoxy grout pile encasement will be field measured as the total number of linear feet of piling encased and accepted. Measurement will be made parallel to the axis of the pile from bottom of FRP jacket to top of FRP jacket.

Basis of Payment:

The quantity of FRP jacket and epoxy grout pile encasement will be paid for at the Contract unit price per linear foot. Price and payment will constitute full compensation for furnishing and placing all materials as described in this specification, for cleaning and preparing the piles, collecting and disposing of material removed during the pile cleaning process, for excavating and backfilling streambed material, and for all labor, equipment, tools and incidentals required to complete the work.

10/21/2019

610500 - ULTRA HIGH-PERFORMANCE CONCRETE

Description:

This specification consists of mixing, transporting, placing, finishing, curing and grinding of Ultra High Performance Concrete (UHPC) for use in connections between precast structural elements in accordance with the details and notes in the Contract Documents and as directed by the Engineer. UHPC is a cementitious composite material composed of an optimized gradation of granular constituents, a water-to-cementitious materials ratio less than 0.25 and a high percentage of discontinuous internal fiber reinforcement.

Materials:

Commonly used materials are as follows. All materials must come from the same batch or lot.

- (a) *Fine Aggregate* - Crushed Quartz with 100 % passing the No. 30 sieve and a maximum of 3% passing the No. 200 sieve.
- (b) *Cementitious Material* - Section 801 - Portland Cement and Blended Hydraulic Cements.
- (c) *Steel Fibers* - ASTM A 820, Type 1, cold drawn high-carbon steel with a minimum tensile strength of 300 ksi. Minimum steel fiber content shall be 2% of the mix's dry volume.
- (d) *Water* - Section 803 - Water for Mixing Portland Cement.
- (e) *Admixtures* - Only as directed by the manufactures representative.

The UHPC mixture shall meet the conditions listed in Table 1: UHPC Material Properties after 28 days, unless otherwise noted in the Contract Documents or as directed by the Engineer. Material properties listed below shall be verified by the manufacturer and submitted for approval in the Placement Plan.

Table 1: UHPC Material Properties		
Description	Test Method	Acceptance Criteria
Compressive Strength <i>Ends of cylinders must be ground flush prior to testing. Saw cutting, capping, and use</i>	AASHTO T 22 (3"x6" cylinders) (150 psi/sec loading rate)	≥ 22 ksi after 28 days

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<i>of neoprene pads are not permitted.</i>		
Shrinkage	AASHTO T 160 / ASTM C 157	≤ 800 micro-strain
Rapid Chloride Ion Penetrability or Surface Resistivity Testing	AASHTO T 277 / ASTM C 1202 or AASHTO TP 95	≤ 350 coulombs
Chloride Ion Penetrability	AASHTO T 259 (1/2" depth)	< 0.1183 lbs/yd ³
Scaling Resistance	ASTM C 672	Y < 3
Freeze-Thaw Resistance	AASHTO T 161 / ASTM C 666A (300 cycles)	Relative Dynamic Modulus of Elasticity > 95%
Alkali-Silica Reaction	ASTM C 1567 (Modified)	≤ 0.08% at 28 days
Slump Flow and Visual Stability	ASTM C1437 / ASTM C 1611	7 inches (Minimum) 10 inches (Maximum) No bleed water Consistent fiber distribution

At least 60 days prior to the placement of UHPC, submit a prepackaged batch of dry ingredients and admixtures sufficient for the Department to make a one cubic foot trial batch of UHPC. Any testing for alkali-silica reaction or permeability will be performed on specimens without steel reinforcement. Batch proportions shall otherwise remain the same per the prepackaged blend and water to cementitious materials ratio (w/cm).

Construction Methods:

(A) Storage: Assure proper storage of all materials including but not limited to cement, aggregate, steel reinforcement and additives, as required by the supplier's recommendation in order to protect the integrity of the materials against the loss of physical and mechanical properties.

(B) Placement Plan: Submit a Placement Plan with a detailed construction work schedule to the Engineer for review at least 10 days prior to the scheduled UHPC placement pour. The Placement Plan shall address at a minimum:

The following list is intended as a guide and may not address all of the means and methods the Contractor may elect to use. The Contractor is expected to assemble a comprehensive list of all necessary items for executing the placement of UHPC.

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- Responsible personnel and hierarchy.
- Equipment – including but not limited to pumps, hoses, mixers, holding tanks, wheelbarrows, scales, meters, thermometers, floats, screeds, burlap, plastic, heaters, blankets, etc.
- Quality Control of batch proportions - including dry ingredients, steel fibers, water and admixtures.
- Quality Control of mixing time and batch times.
- Batch procedure sequence.
- Form work – including materials and removal.
- Placement procedure – including but not limited to surface preparation (comprising of exposed aggregate surface finish along precast elements and pre-wetting the precast concrete interface to a saturated-surface-dry (SSD) condition before the placement of UHPC), spreading, finishing, and curing protection. Include provisions for acceptable ambient conditions and batch temperatures and corrective measures as appropriate. Include means and methods to ensure all air is displaced by the UHPC and the void is completely filled.
- Threshold limits for ambient temperature, ambient relative humidity, batch consistency, batch temperature, batch times and related corrective actions.
- Construction joints, if needed, within the UHPC should be detailed and approved by the Engineer.
- Means and methods for water containment and clean up, for pre-wetting and for watertight integrity testing.

Arrange for a meeting between the UHPC manufacturer's representative, the Contractor's staff, and representatives from DelDOT Bridge Design, Construction, and Materials and Research to review the Contractor's Placement Plan. No UHPC pour will be permitted until the aforementioned Placement Plan has been submitted by the Contractor and approved by the Engineer.

Pumping of UHPC is not allowed.

Submit calculations and detailed drawings of the formwork, signed and sealed by a Professional Engineer registered in the State of Delaware. The design and fabrication of forms shall be consistent with the installation drawings and shall follow the recommendations of the UHPC manufacturer. Refer to Section C of the Construction Methods for additional requirements.

Construction loads applied to the bridge during UHPC placement and curing are the responsibility of the Contractor. Submit the weight and placement of concrete buggies, grinding equipment or other significant construction loads for review as part of the proposed Placement Plan.

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(C) Forming, Mixing, Transporting, Placing and Curing: Design and fabricate formwork to adhere to Section 604.03.2 of the Delaware Standard Construction Specifications and the recommendations of the UHPC manufacturer. Construct forms from nonabsorbent material that are properly sealed and capable of resisting the hydrostatic pressures from UHPC in the unhardened state. Do not remove formwork until a compressive strength of 10 ksi is achieved. Internal vibration of the UHPC is not acceptable. However, rodding may be satisfactory to achieve a suitable blended connection where two successive pours meet.

All UHPC joints shall be covered by a top form with a moisture barrier. Supplemental heat can be provided to the UHPC and surrounding prefabricated elements to reduce initial set times and accelerate strength gain. The proposed method of artificial heating the precast concrete element shall be included in the installation drawings. Follow the UHPC manufacturer's recommendations for curing to attain the required strength to meet the project schedule.

Once the UHPC reaches a compressive strength of 10 ksi, the top forms of the joint may be removed to facilitate grinding of the joint to be even with the top surface of precast concrete element.

Forming, batching, placing, and curing shall be in accordance with the UHPC manufacturer's recommendations and as submitted and accepted by the Engineer.

Representatives of the UHPC manufacturer knowledgeable in supplying, mixing, transporting, placing, finishing and curing of the UHPC material must be present during mixing, transporting and placing of the UHPC. The Contractor shall arrange for two manufacturer's representatives to be on site for the duration of the UHPC construction; one representative will remain with the mixing operations and the second representative will remain with the placement operations. Do not start mixing or placing UHPC until the manufacturer's representatives are on-site. Place UHPC in accordance with the approved Placement Plan using one continuous pour unless otherwise detailed in the Contract Documents or as approved per the Placement Plan. UHPC should not freeze before attaining a compressive strength of 10 ksi.

Provide a minimum of two portable batching units for mixing of the UHPC. Mixing equipment which is not supplied by the UHPC manufacturer, must be reviewed by the UHPC manufacturer for adequacy. During batching keep the temperature of the UHPC below 90 degrees F; ice may be added to the mix as recommended by the UHPC manufacturer's representative.

The Contractor shall arrange for an on-site meeting with the UHPC manufacturer's representative one day before the start of the actual UHPC placement. The Contractor's staff and representatives from DelDOT Bridge Design, Construction, and Materials and Research, shall attend the meeting. The objective of the meeting will be to clearly outline the procedures for mixing, transporting, finishing and curing of the UHPC.

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(D) Acceptance Testing: DeIDOT Materials and Research will be on site during the placement of UHPC. To schedule a representative, contact DeIDOT Materials and Research a minimum of 48 hours prior to the anticipated UHPC placement. A representative from the Materials and Research section will perform a slump flow test according to ASTM C 1437 / ASTM C 1611 on each batch of UHPC. DeIDOT Materials and Research will cast 3"x6" cylinders according to AASHTO T 23 at a minimum of once per day. Cylinders shall be cast in a single lift. Compressive strength testing will be performed at 1, 2, 3, 4 and 28 day cure times. Final acceptance will be based upon 4 day and 28 day strengths. Field coring of UHPC for dispute resolution will not be allowed. Additional specimens will be cast for permeability testing. A minimum of two lots will be selected at random from the permeability specimens and tested in accordance with AASHTO T 277 / ASTM C 1202 and AASHTO TP 95. In the event of a discrepancy between the two methods, results from ASTM C 1202 shall supersede. If one specimen from either lot exceeds the maximum permeability, two additional specimens will be selected and tested in accordance with AASHTO T 277 / ASTM C 1202, the average of which will replace the failed specimen result.

The Contractor is responsible for providing an adequate location to place acceptance specimens for initial curing prior to transport to the lab. Curing boxes will be equipped with supplemental heat or cooling as necessary to cure specimens in accordance with ASTM C 31. Testing performed by the DeIDOT Materials and Research has been summarized in Table 2: DeIDOT M&R UHPC Acceptance Testing. Performance frequencies of each test listed in Table 2, are a minimum value. Tests may be performed at more frequent intervals than described in Table 2, at the discretion of the Engineer or DeIDOT Materials and Research division.

Table 2: DeIDOT M&R UHPC Acceptance Testing			
Description	Test Method	Acceptance Criteria	Frequency
Compressive Strength	AASHTO T 22	≥ 22 ksi after 28 days ≥ 14 ksi after 4 days (3"x6" cylinders) (150 psi/sec loading rate)	At least once per 25 CY or once per 12 hour shift
Rapid Chloride Ion Penetrability or Surface Resistivity Testing	AASHTO T 277 / ASTM C 1202 or AASHTO TP 95	≤ 350 coulombs after 28 days	1 per job (Performed prior to field placement)
Slump Flow and Visual Stability	ASTM C1437 / ASTM C 1611	7 inches (Min.) 10 inches (Max.) No bleed water Consistent fiber distribution	1 per batch

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(E) Surface Preparation: An exposed aggregate finish shall be created on all surfaces of the precast concrete element in contact with UHPC to facilitate bond. The exposed aggregate finish shall have a 0.25-inch amplitude. In addition, the concrete contact areas shall be wetted to achieve a saturated surface dry (SSD) condition before UHPC placement. Keep wet and remove all surface water just prior to UHPC placement. Submit the procedures for achieving SSD condition as part of the proposed Placement Plan. The procedures may include: continuously wetted burlap in all joints for 12 hours prior to placement of UHPC; supplemental misting of concrete surfaces after burlap is removed if UHPC placement is delayed; etcetera.

(F) Surface Profile: The finished surface of the UHPC field joints shall be flush with adjacent precast elements to within a tolerance of plus $\frac{1}{4}$ inch and minus 0 inches. After curing, grind the UHPC surface smooth with adjacent concrete elements in order to match the profile of the structural elements that are being connected within the acceptable surface tolerance. Grinding of the UHPC surface can be performed when a minimum strength of 10 ksi is achieved. During grinding operations, if steel fiber pullout is observed, grinding shall be suspended and not resumed until approved by the Engineer.

If deemed as necessary by the Engineer, a watertight integrity test shall be performed on 10% of the joints after grinding has been completed. The test shall consist of continuously applying running water at an approximate rate of 300 gallons per hour along the length of the joints to be tested, for a duration of 30 minutes. The underside of the joint shall be inspected for water leakage at 30 minutes and at 1 hour. The joint shall be considered watertight if no dripping water or water droplets are visible underneath precast concrete element areas along the full length of the joint. If the results of the watertight integrity test are not satisfactory, the Engineer will determine the required corrective action.

Traffic shall not be permitted on the bridge until the UHPC has achieved a minimum compressive strength of 14 ksi or unless otherwise approved by the Engineer.

Method of Measurement:

The quantity of Ultra High Performance Concrete will be measured as the number of cubic feet of UHPC placed and accepted. The volume will be computed using the dimensions shown on the plans. The quantity of grinding will not be measured.

Basis of Payment:

The quantity of UHPC will be paid at the Contract unit price per cubic foot. Price and payment will constitute full compensation for mixing, transporting, placing, finishing, curing, testing and grinding and for furnishing all equipment, tools, labor, and incidentals required to complete the work.

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Additional quantity of material used in the determination of material properties and for acceptance testing as described herein will be furnished at no additional cost to the Department. No additional payment will be made for joint surface preparation or for grinding procedures.

If the UHPC does not meet the minimal material properties as described herein, the UHPC shall be removed and replaced or remediated to the satisfaction of the Engineer at the Contractor's expense. If watertight integrity tests are required by the Engineer, such tests will be performed no additional cost to the Department. No additional payment will be made for remedial solutions to insufficient bonding of joints.

4/7/2017

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612504 - PRECAST APPROACH SLAB PANELS AND SLEEPER SLAB UNITS

Description:

This work consists of furnishing, erecting, and installing full-depth precast concrete approach slab panels and precast sleeper slab units including all necessary materials and equipment to complete the work as shown on the Plans and as directed by the Engineer for Contract T201707403. The use of site cast-in-place concrete for approach slab panels and/or sleeper slab units will be considered as an acceptable alternative subject to receipt of written authorization from the Engineer.

Submittals:

Submit the following to the Engineer for written approval or acceptance.

A. Shop Drawings

Prepare shop drawings for each panel and unit sealed by a Professional Engineer registered in the State of Delaware. Design, detail, and locate all lifting inserts, loops or other lifting devices. Design lifting hardware according to the provisions of Chapter 5 of the PCI Design Handbook. Provide a Certificate of Compliance for non-shrink grout (refer to Materials subsection below). Provide sample of calculations for determining haunch depths for setting support angles. Calculations shall show that principal tensile stresses on both surface, especially along underside shear troughs do not exceed the modulus of rupture during the fabrication, stripping, handling, shipping, and erection of the panel or unit. Calculations shall conform to Chapter 5 of the PCI Design Handbook requirements. Do not order materials or begin work until receiving final approval of the shop detail drawings.

B. Erection Plans

The Contractor shall prepare erection drawings and supporting calculations sealed by a Professional Engineer registered in the State of Delaware and shall include the following at a minimum on the erection plans:

1. Minimum clearances of exposed reinforcing to adjacent panel and unit edges.
2. Locations and details of lifting devices.

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3. Type and amount of any additional reinforcing, if required.
4. Minimum compressive strength attained prior to handling the panels or units.
5. Table showing predicted stresses and loadings encountered during all stages of panel and unit life up to installation.
6. Cables and lifting equipment needed.
7. Crane positions, pick locations, and crane charts
8. Material laydown areas
9. Details for any subgrade improvements required underneath the proposed locations of the sleeper slab units and equipment used to achieve the required grade and compaction requirements
10. Detailed procedures for lifting, moving, lowering, and adjusting panels and units into place.
11. Approach slab panel and sleeper slab unit number designation and sequence of erection.

C. Ultra-High-Performance Concrete (UHPC) Closure Pours

The Contractor shall submit to the Engineer for review the proposed method and equipment for forming the closure pours and placing UHPC for making all panel-to-panel connections plans.

Materials:

A. Concrete

Use Class D Portland Cement Concrete (PCC) for precast concrete approach slab panels and precast concrete sleeper slab units as specified in Section 1022 of the Standard Specifications except that the minimum 28-day compressive strength shall be 5000 psi. Use . inch maximum size aggregate. Place nonferrous reinforcement fibers.

B. Reinforcing Steel

Reinforcing steel shall meet AASHTO M31 Grade 60. Bars shall be epoxy-coated in conformance with ASTM A775. Reinforcement within a panel or unit shall be full-length, single bars. Do not use lap splices within a panel or unit. Fabrication and handling of bars shall conform to ASTM D3963.

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C. Vent Tubes

Use 2" PVC pipe for UHPC grout ports and vents.

D. Lifting Devices

Lifting devices shall safely support the required vertical and horizontal forces with the applicable safety factors as specified in the PCI Design Handbook, Chapter 5. Lifting devices shall have 2 inches top cover and 1 inch bottom cover after installation. This may require partial removal of the device after installation. The lifting device shall be galvanized after fabrication in conformance with AASHTO M111.

E. Non-shrink Grout

Use non-shrink grout for patching concrete after removing all lifting devices. Non-shrink grout shall meet ASTM C1107 grade C

F. Grout Dams

Grout dams shall be foam strips fabricated from rigid high-density extruded polystyrene (XPS) conforming to ASTM C578 Type VII or approved equal. Grout dams shall be sized appropriately to prevent leakage during all under-panel grouting.

G. Grout

Grout for grout-supported bedding material may be proportioned under ASTM C938 or use prepackaged grout complying with ASTM C1107. Fine aggregate if used must meet grading two (2) in ASTM C637. Proportion the ingredients of the grout to meet the properties in Table 1.

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TABLE 1		
Cementitious Bedding Material Properties		
Quality Characteristic	Test method	Requirement
Compressive Strength at 1 hour	ASTM C942	500 PSI Min.
Compressive Strength at 7 days	ASTM C942	2,500 PSI Min.
Expansion	ASTM C940	0 to 3.0%
Bleeding at 30 minutes	ASTM C940	0.10% Max.
Eflux Time	ASTM C939	15 to 30 seconds
Shrinkage at 28 days	ASTM C157	< 0.04% dry
Flowability	ASTM C939	≤ 30 seconds - ½" flow cone

Grout for encasement and fill material shall meet the requirements shown in Table 2.

TABLE 2		
ENCASEMENT AND GROUT FILL MATERIAL REQUIREMENTS FOR MORTARS		
Property	Test Method	Requirement
Compressive Strength, 28-day min.	ASTM C109	5,000 psi min
Compressive Strength, open to traffic	ASTM C109	2,500 psi
Maximum Expansion	ASTM C1090	0.40%
Maximum Shrinkage	ASTM C1090	0.050%
Freeze-Thaw, min.	ASTM C666	95.0% @ 300 cycles
Initial Set Time, min.	ASTM C266	15 min.

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Chloride Content, max.	ASTM C1152	0.050%
Sulfate Content, max.	ASTM C1038	0.01%

Grout will be tested for compressive strength by the Department at intervals determined by the Engineer.

H. Granular Bedding for Grade-Support of Sleeper Slab Units

Bedding material for grade-support of the precast sleeper slab units shall be crushed stone meeting the gradation shown in Table 3 below. The material shall be free of deleterious material and shall be supplied at the optimum moisture to facilitate compaction and consolidation.

Table 3 Granular Bedding Course Gradation	
Sieve Size	Percent Passing
3/8 inch	100%
#4	85-100%
#10	55 - 75%
#40	10 - 40%
#200	0 - 10%

Quality Control and Assurance.

Precast deck panels shall be manufactured in a PCI Certified plant facility capable of producing Category B2 or higher bridge products. Quality Control (QC) is the responsibility of the Contractor. The person in charge of the QC Department shall have completed Level II or Level III segments of the PCI Plant Quality Personnel Certification Program (PQPC) unless otherwise agreed to by the Engineer. All technicians performing concrete testing shall hold a current ACI Concrete Field Testing Technician Certification Grade I, or equivalent, or work under the direct supervision of an ACI certified technician.

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Quality Assurance (QA) is the prerogative of the Department. The role of the QA Inspector includes but is not limited to:

1. Witnessing, documenting, and reporting on the performance of the QC Department
2. Collecting all certifications, calibrations, and reports necessary to assure that the product meets the specified requirements
3. Witnessing the testing of all freshly mixed concrete
4. Witnessing the placement of all concrete
5. Witnessing the testing of process control cylinders for release and design strength
6. Determining the acceptability of the finished product

The Contractor shall give adequate notice to the Department prior to beginning any of the above operations. The presence of the QA Inspector does not relieve the Contractor of the responsibility of meeting all the requirements of the Plans and Specifications herein.

Permanently mark each precast approach slab panel and sleeper slab unit with date of casting and Manufacturer's identification. Stamp markings in fresh concrete.

Prevent cracking or damage during handling and storage of the precast panels or units. Panels or units that sustain damage or surface defects during fabrication, handling, storage, transporting, or erection are subject to review and rejection.

Any of the following conditions shall be cause for rejection of precast panels:

1. Any cracks transverse or diagonal to the reinforcement pattern and crossing more than one reinforcing bar with crack widths greater than 0.15 mm.
2. Any crack parallel to a reinforcing bar and longer than 1/3 of the panel length with crack widths greater than 0.15 mm.
3. Cracks shorter than 1/3 of the panel length and occurring at more than 25% of the total number of bars in the panel.
4. Voids or honeycombed areas with exposed reinforcing bars.

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All proposed repair procedures shall be in writing. Approval shall be obtained from the Engineer before performing any repairs. Repair work must reestablish the panel fs/unit fs structural integrity, durability, and aesthetics to the satisfaction of the Engineer. Failure to take corrective action to eliminate repetitive damage is cause for rejection of the additional damaged panels or units whether repaired or not. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection. Full depth cracking and breakage greater than 12 inches in length are cause for rejection.

Precast approach slab panel and sleeper slab unit dimensional tolerances shall comply with Table 4 - Dimensional Tolerances for Precast Panels/Units:

Table 4 Dimensional Tolerances for Precast Panels/Units	
Panel Dimensions: Length & Width	± 1/4"
Panel Dimensions: Nominal Thickness	± 1/8"
Panel Dimensions: Squareness (diagonal difference @ top of panel)	± 3/16"
Horizontal Alignment	± 1/4"
Deviation from straightness of mating edge of panels Vertical Alignment - Camber, Horizontal Skew, and Vertical Batter	± 1/8"
Position of lifting anchors (horizontal location)	± 6.0"
Position of reinforcement (horizontal & vertical)	± 1/2"
Position of dowel bar inserts (horizontal & vertical)	± 1/4"
Dimensions of block outs & UHPC joint pockets	± 1/4"

Construction Methods:

A. Field Verification

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The Contractor shall verify dimensions shown on the Plans by field measurements. All necessary field information required for the fabrication and the installation of precast approach slab panels and sleeper slab units shall be obtained before any preparation of the shop drawings or the erection plans. Any significant variation from the Plans shall be reported to the Engineer.

B. Fabrication

Do not place concrete in the forms until the Engineer has inspected and approved the placement of all materials in the precast approach slab panels and sleeper slab units. The top surface of the as-installed precast approach slab panels and sleeper slab units shall have a smooth, flat float finish. The surface of the precast approach slab panels shall later be blast cleaned after installation prior to placing the UHPC overlay and final diamond grinding. Place reinforcing steel in the approach slab panels so that only non-contact lap splices will result between individual panels. Wet cure the approach slab panels and sleeper slab units for 14 consecutive days. This cure is to begin immediately after performing the final finish. Wet cure the approach slab panels and sleeper slab units by covering all exposed surfaces with wet burlap, cotton mats, or both, and plastic sheets. Maintain a saturated condition for the burlap and cotton for the entire duration of the 14 days. Do not strip the forms before the approach slab panels and sleeper slab units have obtained a minimum compressive strength of 1000 psi. All concrete surfaces which are intended to bond with the UHPC shall have an exposed aggregate finish. The surface may be created by applying a gelatinous retarder to the formwork followed by removal (washing) of un-hydrated paste from the hardened concrete after removal of the formwork.

C. Placing Precast Approach Slab Panels and Sleeper Slab Units

The Contractor shall place the precast panels and units as shown in his approved erection plan. Comply with the precast approach slab panel and sleeper slab placement tolerances in Table 5 unless noted otherwise in the Contract Documents or accepted pre-installation Submittals.

Table 5	
Precast Approach Slab Panels and Sleeper Slab Units Placement Tolerances	
Horizontal Alignment: Longitudinal centerline to surveyed centerline marked on the surface of the base and adjacent panels.	½" maximum
Transverse centerline to surveyed marks on adjacent panels	½" maximum
Vertical alignment: Top surface of precast panel with respect to top surface of adjacent panels at any point	1/4" maximum
Gap width at top surface between adjoining panels Note: Maintaining variable longitudinal joint width in excess of 1/2 inch will be cause for stoppage of panel installation operations until the Contractor states in writing how he plans to correct this deficiency.	½" maximum transverse ½" maximum longitudinal

D. Preparation and Installation of UHPC Joints

Refer to the special provisions for Item 610500 . Ultra-High-Performance Concrete for additional information related to work under this subsection. The Contractor shall visually inspect the shear lugs and reinforcing steel for proper clearances prior to placing UHPC joint material. Immediately before placing the UHPC joint material, the precast approach slab panel surfaces to be bonded shall be wetted to obtain a saturated surface dry (SSD) condition. The bonded surfaces shall be kept free from laitance, dirt, dust, paint, grease, oil, rust, or any contaminant other than water. Conduct a pre-test of the UHPC material prior to field installation using mock-ups of the joints to determine flowability, sealing and whether or not subsequent cracking will occur. Include mock-ups to match the same configuration as the joint details shown on the Plans. The pre-test shall include a water-tightness test to assess the UHPC-to-concrete bond performance. If results are unsatisfactory in the opinion of the Department, the Engineer will determine the required corrective action. The mockup will be included in the cost for Item 610500 . Ultra-High-Performance Concrete. The onsite manufacturer’s representative shall advise the Contractor on how to reduce the heat of hydration such as wet curing or adding retarding admixture if the heat is excessive.

E. Placement of Bedding Grout and Encasement Grout: The Contractor shall place all grout as shown in the approved installation plan.

The Contractor shall verify that in-place panels that have been subjected to traffic loading are at correct grade and in compliance with the panel placement tolerances in Table 5 prior to grout placement.

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Placement of dowel bar grout shall be completed within 48-hours of initial panel placement. If adverse weather delays grouting operations, complete as soon as weather permits. Place bedding grout after dowel bar grout and in the same work shift. Construction traffic shall be kept off of panels after grouting and prior to opening to traffic.

F. Diamond Grinding

Grind the top of the precast approach slab panels to correct any uneven surfaces across the panel joints. Profile grind up to . inch maximum only after all panels are in place, grouting completed, and UHPC design strength has been achieved. Diamond grind the top of the completed approach slab panels to achieve the required finish.

Method of Measurement:

The quantity of Precast Concrete Approach Slab Panels and Precast Sleeper Slab Units will be measured using Plan quantities.

Basis of Payment:

The payment for Precast Concrete Approach Slab Panels and Precast Sleeper Slab Units will be at the Contract unit price bid per cubic yard. Price and payment will constitute full compensation for fabricating, transporting and placing of the approach slab panels and sleeper slab units; survey; forming, curing and testing of UHPC joints; mechanical grooving; and for furnishing all equipment, tools, labor, and incidentals required to complete the work.

Additional quantities of material used for the determination of material properties or for acceptance testing as described herein will be furnished at no additional cost to the Department.

Quantities of reinforcing steel incorporated into the precast concrete approach slab panels and precast sleeper slab units and extending into panel joints will be incidental to this item. Furnishing and placing UHPC joint material will be paid for under Item 610500 . Ultra-High Performance Concrete. Placement of the UHPC Overlay on precast approach slabs will be paid for under Item 6255XX . Ultra-High Performance Concrete Overlay. Diamond grinding of the entire completed approach slab to the required finish, will be measured and paid for according to Item 501502 - Diamond Grinding for P.C.C. Pavement and Precast Pavement.

10/3/2018

615501 – PREFABRICATED SUPERSTRUCTURE MODULES

Description:

Furnish, fabricate, handle, transport, erect, and grind prefabricated superstructure modules. Each prefabricated superstructure module consists of two steel beams constructed with a reinforced lightweight concrete deck made composite with both beams, assembled prior to erection. The exterior modules are also prefabricated with a reinforced lightweight concrete parapet. Prefabricated modules are then erected adjacent to each other to form a complete superstructure.

Materials:

Provide Materials as specified in:

Concrete Structures	Section 610, Section 1022
Steel Structures	Section 615
Steel Coatings	Section 616

Construction:

A. Submittals and Working Drawings

Submittals and Working Drawings must be signed and sealed by a registered Professional Engineer in the State of Delaware. Submit Working Drawings a minimum of 30 days prior to the commencement of superstructure module fabrication.

The Contractor has the option to use built-up plate girders in lieu of rolled W-beams provided it is at no additional cost to the department. Any and all substitutions shall be approved by the Engineer. The Department makes no guarantees that the submittal of an alternate built-up plate girder will be accepted. At a minimum, the Contractor must demonstrate the plate girder has similar section properties and that procurement and fabrication will not delay the project. If exercised, the overall depth and the bottom flange width of the alternative built-up plate girder shall match the corresponding W-beam as prescribed in the Plans.

The Contractor shall provide a Camber Analysis that reflects the means and methods in the Module Fabrication Plan and the Assembly Plan and as detailed in the Fabrication Drawings. The Camber Analysis, Module Fabrication Plan, Assembly Plan, and Fabrication Drawings shall be submitted jointly for review and approval by the Engineer.

The Contractor shall not order Materials or begin work until approval of all Submittals and Working Drawings by the Engineer. The Contractor shall distribute approved Camber Analysis, Module Fabrication Plan and Assembly Plans to all parties involved in the fabrication process of the Prefabricated Superstructure Models prior to the start of work or associated material orders.

Include the following in the Submittals and Working Drawings at a minimum:

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1. Camber Analysis

The camber tables provided in the Plans are approximate; values provided are based on design, fabrication and assembly assumptions. The Contractor is responsible for providing camber calculations to reflect fabrication and assembly with consideration of approved beam section properties, concrete strength and unit weight, temporary concrete formwork, diaphragm installation, and all other means and methods. Communication amongst all parties involved in fabrication is imperative.

The Camber Analysis shall provide camber values of the steel beams at the tenth-points at various check-points throughout the superstructure module fabrication process. These values shall be verified with survey and provided to the Engineer for review and approval prior to beginning the next stage of work in accordance with B. Quality Assurance herein. The check-points will be dependent on the fabricators means and methods and will be established by the Engineer upon reviewing and accepting the Submittals and Working Drawings. All camber values are to be computed and surveyed with the beams in the vertical position.

At a minimum, the Contractor shall provide a Camber Analysis and associated fabrication survey for the following check-points:

- i. After the beams have been cambered.
- ii. After the module diaphragms have been placed.
- iii. After the deck forms have been placed.
- iv. After the concrete deck has been poured and the forms removed.
- v. After the concrete barrier has been placed.

2. Module Fabrication Plan

The Module Fabrication Plan pertains to construction operations during framing of the steel beams and construction of the concrete deck. Include the following:

- i. Name of the firm(s) and associated personnel that will be supervising and/or performing module fabrication.
- ii. Location and description of fabrication site. Include confirmation of an agreement between Contractor and property owner to allow use of property.
- iii. Details of all Equipment that will be employed for the construction of the modules.
- iv. Details of temporary supports and bracing used during framing and deck placement.
- v. Methods and details of temporary support system used to fabricate modules. Contractor is responsible for the design and stability of the temporary support system during all construction operations. Include details and calculations for temporary support system used to construct modules and how elevations of temporary support will be controlled to match proposed substructure conditions.
- vi. Proposed Critical Path Method (CPM) schedule for module fabrication including: detailed sequence of construction for all module framing and deck placement operations and minimum waiting periods for curing and form stripping.
- vii. Quality control plan pertinent to module fabrication.
- viii. Develop 3D model of modules detailing all reinforcing steel to ensure there are no conflicts between adjacent module's or approach slab reinforcing steel that extend into longitudinal joints or closure pours at supports.

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3. Assembly Plan

The Assembly Plan pertains to construction operations related to lifting, handling, transporting, placing, supporting, and securing the prefabricated superstructure modules. Include the following:

- i. A work area plan depicting temporary and permanent structures, haul roads, site access, Material staging areas, utilities, and other temporary or permanent site features relevant to module assembly. The work area will be restored according to agreeable terms between the awarded Contractor and the owner of the property where work occurs.
- ii. Means and methods for lifting, handling, storing, transporting, and erecting modules.
- iii. Details of lifting devices and attachment points, with computations to demonstrate that all lifting devices have adequate capacity to resist lifting stresses. Provide details of any auxiliary concrete reinforcing required for lifting operations to prevent damage to the concrete deck due to lifting stresses.
- iv. Details of all Equipment to be used to lift modules including: cranes, rigging, blocks, swivels, lifting slings, sling hooks, jacks, etc. Include locations of cranes and pick radii used to erect modules at the bridge site.
- v. Construction load analyses including computations to indicate the magnitude of stress in the modules during lifting operations. The Contractor is responsible for demonstrating that all module components to be lifted have adequate capacity to resist lifting stresses, and therefore cracking and damage due to lifting, and the erection equipment has adequate capacity for the work to be performed.
- vi. Minimum concrete compressive strength achieved prior to handling of the modules.
- vii. Proposed CPM schedule for all assembly operations including: lifting, handling, pre-assembly, transporting, and erecting modules. Account for setting and cure time of substructure and superstructure components.
- viii. Traffic management plan if impacts to traffic occur during transporting or erecting modules. Adhere to Contract Documents for lane closure restrictions and traffic impact limitations.
- ix. Available route to transport modules from the casting site to the bridge site for erection. If load permits are required to cross existing bridges along the transportation route, it is the responsibility of the Contractor to obtain the necessary load permits.
- x. Methods and details of temporary support of the modules during lifting, handling and final placement of the modules, if needed. Include methods of adjusting, bracing, and securing the modules after placement on the proposed substructure.
- xi. Methods and procedures for removing and patching lifting devices, attachment points, leveling devices and other inserts/blockouts, as applicable.
- xii. Procedures for controlling horizontal and vertical tolerance limits. Include details of any alignment brackets, jigs, templates, shims, etc.
- xiii. Methods for leveling any differential camber between adjacent modules prior to placing closure pour.

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- xiv. Methods and details of grinding the top deck surface after module erection and closure pours are complete.

4. Fabrication Drawings

Fabrication Drawings pertain to documentation of Material data, Material testing, quantities, and other pertinent information related to the fabrication of superstructure modules. Include the following at a minimum:

- i. Structural steel in accordance with Section 615.03.B.1 including shear connectors.
- ii. Concrete Quality Control Plan in accordance with Section 610.03.A.3.
- iii. Reinforcing bar list. Provide all reinforcing steel bar bends and bar lengths for each precast unit in a reinforcement schedule. Use CRSI or ACI tables as applicable. Where bars are to be bent more accurately than standard bending tolerances, bending dimensions requiring closer fabrication should have limits indicated on the shop drawings
- iv. Bill of Materials including all accessories.

B. Quality Assurance

1. Prefabricated superstructure modules will be inspected by the Engineer or a representative of the Engineer, for condition and quality assurance. Inspections will occur as desired by the Engineer, but at a minimum will include: during fabrication, storage, handling, and erection.
 - i. As requested, allow site access of the Engineer or a representative of the Engineer to inspect the modules.
 - ii. Survey during fabrication and otherwise shall be provided by the Contractor.
2. Mark each module with a unique identification system, date of fabrication, and if applicable supplier identification. Markings will be readily visible for purposes of inspection and erection.
3. Repair defects and/or damage to precast concrete deck of the module in accordance with the following:
 - i. Notify the Engineer of suspected defects and/or damage. Modules that exhibit defects and/or damage may be subject to review or rejection by the Engineer.
 - ii. Submit repair procedures to the Engineer for review and approval. Do not proceed with repair without written approval from the Engineer.
 - iii. Concrete repair work must reestablish the module's structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
 - iv. Determine cause of defects/damage and establish corrective action plan to prevent similar repetitive defects/damage.
 - v. Additional compensation or a time extension will not be approved for the repair or removal and replacement of defected/damaged modules when the Engineer determines the cause to be the responsibility of the Contractor.
4. Modules may be rejected for any of the following reasons:
 - i. Fabrication not in conformance with the Contract Documents.

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- ii. Dimensions not within the allowable tolerances specified in the Contract Documents.
- iii. Camber that does not meet the requirements specified in the Contract Documents, including the approved Camber Analysis submittal.
- iv. Defects indicating concrete proportioning, placement, and/or consolidation not in conformance with the Contract Documents.
- v. Damaged, cracked, or spalled ends or edges preventing satisfactory construction, and/or performance of deck joints.
 - 1. Module rejection due to damaged, cracked, or spalled ends or edges may occur at any time including during fabrications, storage, transport, assembly, or erection.

5. Tolerances

- i. Permissible tolerances for steel beams in accordance with Section 615.03.C.
- ii. Finished concrete deck module surface, after grinding, must not contain variations that exceed 1/4 inch from a 10 foot straightedge in the longitudinal and transverse directions.
- iii. Differential camber between adjacent modules must not exceed 1/2 inch before transport to the bridge site. Control of camber during fabrication is required to achieve ride quality. Establish the differential camber by pre-assembling the modules as required herein.

6. Document test results for module concrete with the following information:

- i. Module identification corresponding to the location of tested concrete material.
- ii. Date and time of concrete placement.
- iii. Concrete cylinder test results.
- iv. Quantity of placed concrete.
- v. Date of form-stripping.
- vi. Temperature and moisture conditions during curing period.
- vii. Repairs, if applicable.

C. Fabrication

- 1. Furnish and fabricate steel beams in accordance with Section 615.
- 2. Furnish, construct, and cure concrete deck with concrete parapets, as applicable, on top of steel beams in accordance with Section 610.
 - i. The use of stay-in-place deck forms will not be permitted.
 - ii. Do not use form support systems that will cause unacceptable overstress or deformation to permanent bridge members.
 - iii. Fabricate longitudinal connection joints of each module unit in accordance with the Special Provision for Item 610500 – Ultra High-Performance Concrete (UHPC).
- 3. Fabricate the concrete portions of the superstructure modules at a National Precast Concrete Association (NPCA) or Precast/Prestressed Concrete Institute (PCI) certified pre-cast concrete fabrication facility.

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4. For the purpose of developing the design dead load deflection, support prefabricated superstructure modules only at the permanent bearing points during the deck casting operation. For module fabrication arrange steel beams to match proposed beam spacing and relative difference between bearing elevations of the final bearing configuration.
 - i. Temporary bracing for lateral stability is acceptable during beam set-up, before the cross-frames/diaphragms are installed. Remove temporary bracing prior to the placement of the concrete deck. During the deck pour, no bracing systems will be in place for lateral stability (with the exception of the cross frames/diaphragms) unless approved by the Engineer.
 - ii. Shored construction to vertically support the beams along their length will not be permitted.
5. Achieve a minimum concrete compressive strength of 30% of the required 28-day design strength as specified in the Contract Documents, before removing formwork used for concrete deck construction.
6. Pre-assemble (dry-fit) adjacent prefabricated superstructure modules to ensure alignment and tolerance limits are met between modules to the satisfaction of the Engineer, before transport to the job site. The approved procedure in the Assembly Plan for leveling any differential camber will be re-evaluated during pre-assembly and verified by the Engineer. Relative bearing seat elevations shall be re-established after successful module pre-assembly and shall be compared to the substructure bearing seat elevations in place. Vertically adjust bearing seat elevations, if required, according to the methods approved in the Assembly Plan. Do not pour transverse or longitudinal connection joints during pre-assembly.
 - i. Evaluate modules for proper fit and placement on the substructure units. Relative placement of the modules shall be verified and reviewed against the substructure elements to ensure compatibility with the substructure pedestals and shear blocks as shown on the Plans.

D. Painting

Provide the paint system in accordance with Section 616 – Steel Coatings. The Contractor has the option of shop painting the superstructure modules or field painting. No additional compensation will be provided for whichever option is selected.

E. Handling and Storing

1. Lifting and handling devices are the responsibility of the Contractor and shall be in accordance with Chapter 5 of the PCI Design Handbook.
2. Modules damaged during handling and/or storage shall be repaired or replaced as described herein and as directed by the Engineer.
3. Lift modules, at the approved designated points and by approved lifting devices properly attached to the module, utilizing proper hoisting procedures. The Contractor is responsible for design of the lifting devices and all necessary precast concrete modifications to accommodate handling stresses in the modules.
 - i. The angle between the top surface of the deck and the lifting line shall not be less than 60 degrees, when measured from the top surface of the deck to the lifting line. If two cranes are used the lifting lines should be vertical.

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4. Do not place additional loading on the module units that will cause unanticipated deflection or creep-induced deformation.
5. Do not subject modules to damaging torsional, dynamic, or impact stresses at any point during handling or storage.
6. Lift and store modules in the upright orientation with steel beams on the bottom side for support, as shown by the final placement of the modules in the Contract Documents.
7. Support prefabricated superstructure modules at the permanent bearing points during storage, with no additional supports provided along the span of the module. Provide adequate support during storage to prevent damage due to differential settlement.
8. Achieve the minimum concrete compressive strength approved in the Assembly Plan prior to moving prefabricated modules.
9. Superstructure modules will be inspected by the Engineer or a representative of the Engineer, for condition and quality assurance during and after handling of the units. If modules are stored for long periods of time they should be inspected once per month by the Engineer and Contractor to ensure continued integrity of the units.

F. Transportation

1. Provide 48-hours of notice to the Engineer prior to transporting modules to the bridge site.
2. Do not transport modules from the casting site until the concrete deck has reached a minimum age of 14 days and the concrete deck attains the minimum compressive design strength specified in the Contract Documents.
3. Transport modules in the upright orientation with steel beams on the bottom side for support, as shown by the final placement of the modules in the Contract Documents. Primary vertical support for the modules shall be provided at the permanent bearing locations, with auxiliary support, bracing, and/or blocking provided as required and as noted in the approved Assembly Plan.
 - i. Modules may be loaded on a trailer that is capable of supporting the modules during transport without inducing damaging axial, torsional, or dynamic stresses to the module.
 - ii. Devices used to secure the modules in place during transportation must extend around the top of the module (over the concrete deck) and not solely attach to the bottom flanges of the beam.
 - iii. Provide shock-absorbing cushioning material at all bearing locations during transportation. Tie-down straps or other means of securing shall be positioned only at designated locations of sufficient bracing and/or blocking.
4. Superstructure modules will be inspected by the Engineer or a representative of the Engineer, for condition and quality assurance after transport of the module to the project site. Material, quality, and condition of the modules will be inspected after transport to the project site.

G. Module Erection

1. Do not erect modules into their final position until the concrete deck has reached a minimum age of 14 days and attains the minimum compressive design strength specified in the Contract Documents.

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2. Do not place modules on substructure components until the substructure components have achieved minimum design strength and, if required, sufficient bracing has been provided at the substructure components to facilitate the Contractor's intended module placement procedures.
 3. Survey the top elevation of the substructure units. Check for proper alignment and that elevations are within specified tolerances. Establish working points, working lines, and benchmark elevations prior to the placement of superstructure modules.
 4. Clean bearing surfaces of the substructure and beams before modules are erected. Ensure substructure bearing area is level and true within acceptable construction tolerances, allowing for proper performance of vertical adjustment methods and elastomeric bearing pads in accordance with the manufacturer's recommendations. Localized smoothing of the substructure bearing area may be performed by grinding or other methods necessary as approved by the Engineer.
 5. Place bearing devices in accordance with Section 623.
 6. Erect modules using lifting devices and/or attachment points as approved by the Working Drawings and as per Section D – Handling and Storing, of this Special Provision.
 7. Set modules in the designated permanent bearing locations of the substructure. Do not allow modules to bear at any location on the substructure not designated on the plans as a bearing location.
 8. Depending on the magnitude, differential camber may be leveled by applying dead load to the nearest beam on the higher module to bring it within the connection tolerance, utilizing a leveling beam to equalize camber, or allowing a blanket grind of the deck to accommodate differences. The leveling procedure shall be demonstrated during the pre-assembly process prior to shipping to the site. The Assembly Plan shall indicate the leveling process to be applied in the field.
 9. Temporarily support, anchor, and brace all erected modules as necessary for stability and to resist gravity loads, wind loads or other loads until they are permanently secured to the substructure, as required and as detailed in the approved Assembly Plan.
 10. Complete installation of bearing devices, etc. in accordance with Section 623.
 11. Patch holes occupied by lifting devices and/or inserts according to approved Working Drawings.
 12. Module units will be inspected by the Engineer or a representative of the Engineer, for condition and quality assurance prior to and after erection of the units.
- H. Closure Pour
1. Level differential camber according to the approved Assembly Plan prior to pouring transverse and longitudinal closure pour. Methods to level differential camber will remain in place until both adjacent joints are filled entirely and the UHPC reaches a minimum compressive strength of 14 ksi.
 2. Do not apply traffic or other loading until the UHPC connection achieves a minimum compressive strength of 14 ksi, unless otherwise approved by the Engineer.
 3. Follow the Special Provision for Item 610500 – Ultra High-Performance Concrete (UHPC) for furnishing and placing UHPC used in the deck closure pour connections.

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I. Grinding and Texturizing

1. Diamond grind the top surface of prefabricated superstructure modules and the UHPC joints to create a smooth transition across each UHPC joint. Profile grind up to ¼” maximum. If diamond grinding is anticipated to be greater than ¼”, the engineer shall be notified immediately. Do not grind the deck surface until UHPC connection pours of the transverse and longitudinal joints have reached a minimum compressive strength of 10 ksi. During grinding operations, if steel fiber pullout is observed in the UHPC, grinding shall be suspended and not resumed until approved by the Engineer.
2. Provide mechanical texturing of top of modules, approach slabs, and UHPC joints if final wearing surface cannot be applied prior to re-opening the bridge to traffic. Do not begin grooving operations until the surface tolerance has been checked and any high points are removed as specified above. Terminate grooves 12 inches from curb lines and scuppers. Terminate grooves within 5 inches, but no closer than 3 inches, of bridge joints. Do not overlap sawed grooves or leave more than 1 inch of the surface without sawed grooves between passes or where a single pass of the grooving machine cannot be made. Remove and collect debris and slurry resulting from the grooving operations concurrently with the grooving operations. Surfaces are to be immediately left in a washed and clean condition, free from slurry and debris. Do not open to traffic until mechanical texturing is complete. Texturing the deck surface with transverse sawed grooves shall meet the following characteristics:
 - i. Perpendicular with centerline
 - ii. Rectangular in shape
 - iii. 1/8 inch (± 1/32 inch) in width
 - iv. 1/8 inch to 3/16 inch in depth
 - v. Random groove pattern of 1.5 inches, 1.75 inches and 2 inches nominal center-to-center sawed groove spacing

Method of Measurement:

The quantity of prefabricated superstructure modules placed and accepted will not be measured.

Basis of Payment:

- A. Payment will be made at the lump sum bid price for all modules per bridge.

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
615501	PREFABRICATED SUPERSTRUCTURE MODULES	LS

- B. Price and payment will constitute full compensation for furnishing all Materials related to the prefabricated superstructure units including: beams, stiffeners, connections plates, diaphragms, shear studs, sole plates, bolts, nuts, washers, reinforcing bar, concrete, scuppers, lifting devices, vertical adjustment shims, concrete inserts, camber adjustment devices; all engineering, administrative services and meetings associated with the preparation of the Submittals and Working Drawings; fabricating, survey, painting, providing parapet control joints, handling, pre-assembling, storing, transporting, erecting, and grinding; and for all labor, equipment and incidentals required to complete the Work.
- C. The repair or removal and replacement of prefabricated superstructure modules due to defective construction, improper fabrication, storing, handling, transporting, or erecting will not be paid.

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- D. The Department will not make separate payment for temporary structures used to fabricate superstructure modules, for acquiring, maintaining, and restoring a temporary fabrication site, or to install, maintain, and remove haul roads that are needed for site access to fabricate and transport superstructure modules.
- E. Price and Payment for furnishing, placing, and curing UHPC for transverse and longitudinal deck closure pours will be paid and specified by Item 610500 – Ultra High-Performance Concrete.
- F. Price and Payment for preparing the deck surface, furnishing, placing, curing, and texturing the proposed final bridge deck overlay surface will be paid and specified by Item 625501 – Polyester Polymer Concrete Overlay Installation and Item 625502 - Furnishing Polyester Polymer Concrete Overlay.
- G. Price and Payment for furnishing and installing conduit, junction boxes, polyethylene drain tube, and other accessories for the navigational lighting system that are embedded within the superstructure modules will be paid and specified by Item 615510 - Navigation Lights System for Fixed Bridges.
- H. No additional compensation will be made by the Department for a proposed built-up plate girder alternative to fabricate the modules, regardless of approval status or selection for use. All costs, including additional analysis, working drawing revisions, etc. as requested by the Engineer will be incidental to Item 615501 – Prefabrication Superstructure Modules.

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615510 - NAVIGATION LIGHTS FOR FIXED BRIDGES

Description:

Furnish and install navigation lighting systems, including all wiring, junction boxes, conduit, wiring devices, lights, attachments to the bridge structure, 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.

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. Meet NEC, NESC, local utility company requirements, and State and local laws and ordinances governing the work.

Schedule and arrange electrical work in a neat, well-organized manner without interference with the work scheduling of other trades.

Catalog Cuts. Submit catalog cuts and shop drawings for approval.

Materials:

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.

Navigation Lights:

Location: The upstream and downstream sides of the channel margins shall be marked with 180 degree bridge mounted red channel margin marker lights. The lights shall be securely mounted on the bridge to show 90

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degrees on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

The upstream and downstream sides of the center of the channel shall be marked with 360 degree bridge mounted green channel center marker lights. The lights shall be in line with the axis of the center of the channel so as to be visible from an approaching vessel.

Housing:

The housing shall be suitable for a marine environment. Furnish unpainted housings of heavy duty cast aluminum or bronze construction with a 1 1/2 to 2 inch threaded conduit opening on the bottom. Construction shall be rain tight and fully gasketed. The light assembly shall be designed for heavy duty, long life service. The design shall provide ready access for lamp service.

Lens: 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.

Lamps:

Lamps shall be 120V AC, 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. In the event of failure of one or more individual LEDs, the remaining LEDs shall continue to operate.

Swivel:

Provide a 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. The swivel design shall provide for all wiring to be completely contained inside the light assembly. The dimension from the center of swivel to focal plane of lens shall allow for visibility of the luminaire below the bridge girder in accordance with Coast Guard requirements.

Stem:

Use a 1 1/2- or 2-inch galvanized pipe or stainless steel pipe as a hanger stem. Furnish and install a 60% counterweight if stem exceeds 5 feet in length.

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Latch:

An automatic latch shall hold the luminaire securely in normal operations and service positions. A firm pull on the service chain shall automatically release the latch, allowing the fixture to pivot. As the luminaire is raised, the latch shall automatically engage to hold the light in the service position.

Mounting:

The base shall be cast of the same material as the fixture head. The light assembly shall be mounted via four inch diameter bolts through the base and junction box.

Service Chain:

A stainless steel, #24 sash type service chain shall be provided to facilitate raising and lowering the luminaire for service. The grab-loop on the chain shall be securely mounted to the bridge as shown on the plans so that it is easily accessible by maintenance personnel for service.

Junction Box:

The assembly shall be equipped with a junction box and a gasketed access cover. The junction box shall be of the same material as the fixture assembly and shall match the navigation light base footprint. Orientation of the junction box shall be capable of rotation in 90 degree increments.

Conduit:

Conduit shall be as specified elsewhere in these Contract Documents.

Junction Wells:

P.C.C. Barrier Junction Wells shall be as specified in Item 830500 -P.C.C. Barrier, Junction Well. Junction Box On Structure shall be as specified in Item 830501 - Junction Box On Structure.

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Wiring:

Cable shall be as specified elsewhere in these Contract Documents.

Construction Methods:

Store navigational lights and appurtenances in a manner which will prevent damage until such time as they are actually installed. Immediately prior to installation, navigation lights and appurtenances shall be inspected for damage by the Engineer. All material which the Engineer determines is damaged or otherwise unusable shall be repaired by the Contractor or replaced in-kind by the Contractor. The Engineer shall make the final determination as to whether damaged material shall be repaired or replaced. Material which the Engineer has determined is not usable shall be removed from the work site by the contractor.

Installation:

Install conduit and barrier junction wells in the bridge parapet walls and bridge deck as shown on the plans. Route conduit and wiring to the navigational lights as shown on the plans.

Navigation lights shall be installed in the manner indicated on the contract plans and per the manufacturer's recommendations. Location and color shall be in accordance with the U.S. Coast Guard requirement and the contract plans.

Testing:

Testing of the navigation lighting system shall be in accordance with Item 843001 - Electrical Testing.

Method of Measurement:

The quantity of Navigation Lights for Fixed Bridges will be paid for will be lump sum.

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Basis of Payment:

Price and payment will be full compensation for all work specified in this Section. Payment will be made under: "Navigation Lights for Fixed Bridges" - lump sum. Conduit, cable and barrier junction wells will be paid under separate pay items as listed elsewhere in the Contract Documents.

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625501 - POLYESTER POLYMER CONCRETE OVERLAY INSTALLATION

625502 - FURNISHING POLYESTER POLYMER CONCRETE OVERLAY

625.01 Description.

Furnish materials and construct concrete overlay on concrete deck surfaces where shown in the Contract Documents or as directed by the Engineer.

625.02 Materials.

- A. Furnish a high molecular weight methacrylate primer in accordance with Section 1045.04.
- B. Furnish aggregate and finishing sand in accordance with Section 1003 and the following:
 - 1. Use the following gradation requirements:

Combined Aggregate		
Sieve Size	3/8" Max. Percent Passing	#4 Sieve Max. Percent Passing
1/2"	100	100
3/8"	83-100	100
#4	65-82	62-85
#8	45-64	45-67
#16	27-48	29-50
#30	12-30	16-36
#50	6-17	5-20
#100	0-7	0-7
#200	0-3	0-3

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2. Aggregate retained on the #8 sieve must have a maximum of 45 percent crushed particles when tested in accordance with AASHTO Test Method T27.

3. Fine aggregate must consist of natural sand only.

4. Aggregate absorption must not exceed one percent as determined by AASHTO Test Methods T84 and T85.

5. At the time of mixing with the resin, the moisture content of the aggregate, as determined by AASHTO Test Method T 255, must not exceed one half of the aggregate absorption.

6. Finish sand must be a dry No. 8/20 commercial quality blast sand.

C. Furnish a polyester binder consisting of polyester resin binder and dry aggregate.

1. The resin must be an unsaturated isophthalic polyester-styrene co-polymer conforming to the following:

Polyester Resin Binder		
Property	Requirement**	Test Method
Viscosity* (RVT No. 1 Spindle, 20 RPM at 77°F)	0.075 to 0.20 Pa•s	ASTM D 2196
Specific Gravity*	1.05 to 1.10 at 77°F	ASTM D 2196
Elongation	35 percent minimum Type I at 0.45"/min. Thickness = 1/4" ± 0.04"	ASTM D 638
		ASTM D 618

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	Sample Conditioning: 18/25/50 + 5/70	
Tensile Strength	17.5 Mpa Minimum Type I at 0.45"/min. Thickness = 1/4" ± 0.04"	ASTM 638
	Sample Conditioning: 18/25/50 ± 5/70	ASTM 618
Styrene Content*	40 percent to 50 percent (by weight)	ASTM D 2369
Silane Coupler	1.0 percent, minimum (by weight of polyester styrene resin)	
PCC Saturated Surface Dry Bond Strength	3.5 Mpa, minimum at 24 hours and 70±1°C	
*Tested prior to adding initiator		
**Values are based on specimens or samples cured or aged at 77°F unless otherwise indicated.		

2. The silane coupler must be an organosilane ester, gammamethacryloxypropyltrimethoxysilane. The promoter shall be compatible with methyl ethyl ketone peroxide (MEKP) and cumene hydroperoxide (CHP) initiators.

D. Submit samples of materials for all components of the overlay system to the Materials and Research Section a minimum of sixty (60) days prior to the overlay application. Samples shall be representative of the materials to be used in the overlay application and shall consist of one four-liter sample for each liquid component and a 5 pound sample for each dry component.

E. Furnish a Material Safety Data Sheet prior to use for each shipment of polyester resin binder and high molecular weight methacrylate resin. All components shall be shipped in strong, substantial containers, bearing the manufacturer's label specifying date of manufacture, batch number, brand name, quantity, and date of expiration or shelf life. In addition, the mixing ratio shall be printed on the label of at least one of the system components. If bulk resin is to be used, the Contractor shall notify the Engineer in writing 10 days prior to the delivery of the bulk resin to the job site. Bulk resin is any resin that is stored in containers in excess of 55 gallons.

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- F. **Basis of Acceptance.** Project acceptance of the polyester overlay materials will be based on the following:
1. Delivery of the overlay materials to the project site in acceptable containers bearing all the label information as required in 1045.04[©].
 2. Receipt of a manufacturer's certification stating the primer, aggregate and polyester binder meet the material requirements found above.
 3. Approval by the Materials and Research Section based on conformance with the material requirements above.

625.03 Construction.

1. General.
 - a. At least ten (10) days before start of work, provide the Engineer with two (2) copies of the manufacturer's written instructions for the installation of the overlay system.
 - b. Ensure that the manufacturer's technical representative is available for up to three (3) working days to make recommendations to facilitate the overlay installation, including surface preparation, overlay application, and overlay cure.
 - c. During surface preparation and overlay application, take precautions to assure that traffic is protected from rebound, dust, and construction activities. Provide appropriate shielding as required and directed by the Engineer.
 - d. During overlay application, provide suitable coverings (e.g. heavy duty drop cloths) to protect all exposed areas not to be overlaid, such as curbs, sidewalks, parapets, etc. Clean and/or repair all damage or defacement resulting from this application to the Engineer's satisfaction at no additional cost.

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2. Storage of Materials.
 - a. Store all materials in accordance with the manufacturer's recommendation to ensure their preservation until used in the work. Applicable fire codes may require special storage facilities for some components of the overlay system.

3. Equipment.
 - a. Surface Preparation.
 - i. Use only equipment for surface preparation that is specified by the overlay manufacturer and approved by the Engineer. Unless otherwise specified, use automatic shot blasting units to clean pavement surfaces. The automatic shot blasting units are to be self propelled and include a vacuum to recover spent abrasives, and the abrasives are to be steel shot. In those areas not accessible to this machinery, the surface may, with the Engineer's approval, be cleaned with blast cleaning equipment. Use magnetic rollers to remove any spent shot remaining on the deck after vacuuming.

 - b. Application.
 - i. Mix polyester concrete in mechanically operated mixers no larger than 9 cubic feet in capacity. A continuous mixer employing an auger screw/chute device may be approved by the Engineer if a demonstration shows its ability to produce a satisfactory product. The continuous mixer must 1) be equipped with a metering device that automatically measures and records the aggregate volumes and the corresponding resin volumes and 2) have a readout gage, visible to the Engineer at all times, that displays the volumes being recorded. Record the volumes at no greater than five (5) minute intervals along with the time and date of each recording. Furnish a printout of the recordings to the Engineer at the end of each work shift.

 - c. Finishing and Texturing.
 - i. Use an approved finishing machine complying with Section 610.03(E)(4)(c)(i) and having a vibrating pan to properly consolidate the mix.

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4. Surface Preparation.

- a. Prepare all structural slab surfaces that will be in contact with the overlay as follows:
- i. Determine the size of shot, flow of shot, forward speed of shot blast machine and number of passes necessary to provide a surface capable of a tensile bond strength greater than or equal to 250 psi or a failure area, at a depth of 1/8" or more into the base concrete, no greater than 50% of the test area. Perform the testing in accordance with ACI 503R-93, Appendix A. The Engineer will designate the location of the test patches.
 - ii. Before application of the primer, clean the entire deck area by shot blasting and other means using the approved cleaning practice to remove asphaltic material, oils, dirt, rubber, curing compounds, paint, carbonation, laitance, weak surface mortar and other potentially detrimental materials that may interfere with the bonding or curing of the overlay. Acceptable cleaning is usually achieved by significantly changing the color of the concrete and mortar and beginning to expose coarse aggregate particles. Mortar which is sound and firmly bonded to the coarse aggregate must have open pores due to cleaning to be considered adequate for bond. Remove areas of asphalt larger than 1 inch in diameter or smaller areas spaced 6 inches apart. Traffic paint lines will be considered clean when the concrete has exposed aggregate showing through the paint stripe. Use a vacuum cleaner to remove all dust and other loose material.
 - iii. If the Engineer determines that an approved cleaning practice has changed prior to the completion of the overlay application, the Contractor must return to the approved cleaning methods and re-clean the suspect areas or verify through tests at no additional cost to the Department that the practice is acceptable.
 - iv. Do not place the overlay until all patching and cleaning operations have been inspected and approved. Remove any contamination of the deck after initial cleaning. The entire overlay system may only be applied following the cleaning and prior to opening the area to traffic.
 - v. Do not expose cleaned pavement surfaces to vehicular or pedestrian traffic other than that required by the overlay operation. If the pavement is contaminated before being overlaid, re-clean the contaminated area by abrasive blasting to the satisfaction of the Engineer. No additional payment will be made for re-cleaning work.

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- vi. Ensure that the concrete is dry at the time of application of the overlay.
 - vii. Clean all steel surfaces that will be in contact with the overlay in accordance with SSPC-SP No. 10, Near-White Blast Cleaning, except that wet blasting methods shall not be allowed.
 - viii. After the cleaning operation is completed, ensure that there is no visible evidence of oil, grease, dirt, rust, loose particles, spent abrasives, or other foreign material on any of the surfaces to be overlaid.
5. Application.
- a. Prime Coat
 - i. Prior to applying the prime coat, ensure the area is dry and blow the area clean with oil-free compressed air. The surface temperature must be at least 50°F.
 - ii. Uniformly apply the prime coat to completely cover the surface to receive the polyester concrete. Use a rate of spread of approximately 2.3 ounces per square foot of deck surface or as recommended by the manufacturer. Allow the prime coat to cure a minimum of 15 minutes before placing polyester concrete.
 - iii. When magnesium phosphate concrete is placed prior to the deck overlay, place the magnesium phosphate concrete at least 72 hours prior to placing the prime coat.
 - iv. When modified high alumina based concrete is placed prior to the deck overlay, do not place the prime coat on said concrete until at least 30 minutes after final set.
 - b. Polyester Concrete
 - i. Test Patches
 - 1.) Prior to constructing the overlay, place one or more trial overlays on a previously constructed concrete base to determine initial set time and to demonstrate the effectiveness of the mixing, placing, and finishing equipment proposed as well as curing period. Each trial overlay must be

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12' wide, at least 6' long, and the same thickness as the overlay to be constructed, and the conditions during the construction of the overlay and equipment used should be similar to those expected and to be used for the construction of the polyester concrete overlay. If the cleaning practice, materials, and installation procedure are not acceptable, the Contractor must remove the failed test patches and make the necessary adjustments and test all test areas at no additional cost to the Department until satisfactory test results are obtained.

- 2.) The test patch must have a minimum bond strength of 250 psi as determined by ACI 503R-93, Appendix A to assure that the overlay adheres to the prepared surface.
 - 3.) If required, remove and dispose of all material used in the trial overlay, including the concrete test patch.
- ii. Place the polyester concrete at least 30 minutes but not more than 120 minutes after the prime coat has been applied.
 - iii. Ensure that the polyester concrete contains approximately 12 percent polyester resin by weight of dry aggregate; the exact percentage will be determined by the Engineer during placement to enable proper finishing and texturing of the overlay surface.
 - iv. Place the polyester overlay at a minimum thickness of $\frac{3}{4}$ ".
 - v. Termination edges of the overlay may require application and finishing by hand trowel due to obstructions such as a curb. Follow all hand troweling by broadcasting aggregate or surface texturing while the resin is still wet to provide acceptable surface friction characteristics.
 - vi. Adequately isolate expansion joints prior to overlaying or they may be sawed within four hours after overlay placement, as approved by the Engineer. The exact time of sawing will be determined by the Engineer.
 - vii. The amount of initiator used in polyester concrete must be sufficient to produce an initial set time between 30 and 120 minutes during placement. The initial set time will be determined by using an initial-setting time Gillmore needle in

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accordance with the requirements of ASTM C266. Use accelerators or inhibitors as recommended by the resin supplier to achieve proper set times.

- viii. Initiate and thoroughly blend the resin binder just prior to mixing with aggregate.
Mix the polyester concrete a minimum of 2 minutes prior to placing.
- ix. Place polyester concrete prior to gelling and within 15 minutes following addition of initiator, whichever occurs first. Discard polyester concrete that is not placed within this time.
- x. The surface temperature of the area to receive polyester concrete must be the same as specified above for the prime coat, a minimum of 50°F.
- xi. Use the finishing and texturing equipment to strike off the polyester concrete to the established grade and cross section. Finishing and texturing equipment must be fitted with vibrators and tines or other means of consolidating and texturing the polyester concrete to the required compaction.
- xii. Apply the finish sand by either mechanical means or hand broadcasting immediately after strike-off, before gelling occurs, and at a minimum rate of 2.75 ounces per square foot.

6. Surface and Thickness Requirements.

- a. The overlay surface will be checked at random by the Engineer immediately after it has hardened to assure that no depressions exist that will pond water. The smoothness of the polyester concrete surface will be tested with a straightedge.
- b. The surface must not vary more than 1/4" from the lower edge of a 12' ±0.2' long straight edge placed in any direction. Remove any surfaces which fail to conform to the above tolerance by grinding with an approved grinding tool.
- c. To ensure adequate pavement friction, the completed overlay surface must be free of any smooth or "glassy" areas such as those resulting from insufficient quantities of surface aggregate. Repair any such surface defects in the manner recommended by the manufacturer and approved by the Engineer.

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- d. Check the thickness of the overlay prior to its initial set using a ruler. If the Engineer determines that the minimum thickness has not been attained, apply an additional layer with a minimum thickness of 1/4" after the overlay hardens at no additional cost to the Department.

7. Finishing.

- a. Texture the surface in accordance with Subsection 610.03(E)(4)(c)(iv).

8. Curing.

- a. Do not permit traffic and equipment on the overlay for a minimum of four (4) hours following final finishing. Protect overlay from moisture for a minimum of four (4) hours after finishing. Allow the polyester overlay to reach final cure before subjecting it to traffic loads. Cure time is dependent upon the ambient and deck temperatures. Actual degree of cure and suitability of the overlay for traffic will be determined by the Engineer.

625.04 Method of Measurement.

Polyester polymer concrete overlay will be paid separately at the Contract Unit Price for furnishing and installation of the overlay.

625.05 Basis of Payment.

- A. Payment will be made for accepted quantities at the contract unit price as follows:

Item No.	Item Description	Unit
625501	POLYESTER POLYMER CONCRETE OVERLAY INSTALLATION	SY-IN
625502	FURNISHING POLYESTER POLYMER CONCRETE OVERLAY	CY

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- B. Price and payment for furnishing overlay constitutes full compensation for furnishing all materials, including the technical representative, needed to construct the overlay.

- C. Price and payment for constructing overlay constitutes full compensation for the preparation of the area to receive overlay including scarifying, shot or grit blasting, removal of rust, oil and other contaminants, protecting the area, placing the bonding grout or primer coat, placing of concrete overlay, consolidating, curing, texturing, constructing and removing test patches, and for all labor, equipment, tools, and incidentals necessary to complete the work.

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701500 - P.C.C. CURB, TYPE 1, MODIFIED

In accordance with Section 701 and as indicated for variable height curb.

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
701500	P.C.C. CURB, TYPE 1, MODIFIED	LF

8/31/2018

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763501 - CONSTRUCTION ENGINEERING

Description:

This work consists of construction lay out including; stakes, lines and grades as specified below. Subsection 105.10 Construction Stakes, Lines and Grades of the Standard Specifications is voided.

Based on contract plans and information provided by the Engineer, the Contractor shall stake out right-of-way and easements lines, limits of construction and wetlands, slopes, profile grades, drainage system, centerline or offset lines, benchmarks, structure working points and any additional points to complete the project.

The Engineer will only establish the following:

- (a) Original and final cross-sections for borrow pits.
- (b) Final cross-sections: Top and bottom pay limit elevations for all excavation bid items that are not field measured by Construction inspection personnel. The Contractor shall notify the Engineer when these pay limit elevations are ready and allow for a minimum of two calendar days for the Engineer to obtain the information.
- (c) Line and grade for extra work added on to the project plans.

Equipment. The Contractor shall use adequate equipment/instruments in a good working order.

He/she shall provide written certification that the equipment/instrument has been calibrated and is within manufacturer's tolerance. The certification shall be dated a maximum of 9 months before the start of construction. The Contractor shall renew the certification a minimum of every 9 months. The equipment/instrument shall have a minimum measuring accuracy of $[3\text{mm}+2\text{ppmxD}]$ and an angle accuracy of up to 2.0 arc seconds or 0.6 milligons. If the Contractor chooses to use GPS technology in construction stakeout, the Contractor shall provide the Engineer with a GPS rover and Automatic Level for the duration of the contract. The GPS rover shall be in good working condition and of similar make and model used by the Contractor. The Contractor shall provide up to 8 hours of formal training on the Contractor's GPS system to a maximum of four Engineer's appointees (DELDOT Construction Inspectors). At the end of the contract, the Engineer will return the GPS rover to the Contractor. If any of the equipment/instruments are found to be out of adjustment or inadequate to perform its function, such instrument or equipment shall be immediately replaced by the Contractor to the satisfaction of the Engineer. Choosing to use GPS technology does not give the contractor authority to use machine control.- Construction Engineering (GPS) Machine Control Grading shall only be used if noted in the General Notes in the plan set outlining the available files that will be provided to the Contractor and "the Release for delivery of documents in electronic form to a contractor" are signed by all parties prior to delivery of any electronic files. Only files designated in the General Notes shall be provided to the contractor. If

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machine control grading is allowed on the project see the "machine control" section of this specification. GPS technology and machine control technology shall not be used in the construction of bridges.

Engineering/Survey Staff. The Contractor shall provide and have available for the project an adequate engineering staff that is competent and experienced to set lines and grades needed to construct the project. The engineering personnel required to perform the work outlined herein shall have experience and ability compatible with the magnitude and scope of the project. Additionally, the Contractor shall employ an engineer or surveyor licensed in the State of Delaware to be responsible for the quality and accuracy of the work done by the engineering staff. When individuals or firms other than the Contractor perform any professional services under this item, that work shall not be subject to the sub contracting requirements of Subsection 108.01 of the Standard Specifications. The Contractor shall assume full responsibility for any errors and/or omissions in the work of the engineering staff described herein. If construction errors are caused due to erroneous work done under Construction Engineering the Contractor accepts full responsibility, no matter when the error is discovered. Consideration will not be given for any extension of contract time or additional compensation due to delays, corrective work, or additional work that may result from faulty and erroneous construction stakeout, surveying, and engineering required by this specification.

Construction Methods:

Performance Requirements:

- (a) Construction Engineering shall include establishing the survey points and survey centerlines; finding, referencing, offsetting the project control points; running a horizontal and vertical circuit to verify the precision of given control points. Establishing plan coordinates and elevation marks for culverts, slopes, subbase, subsurface drains, paving, subgrade, retaining walls, and any other stakes required for control lines and grades; and setting vertical control elevations, such as footings, caps, bridge seats and deck screed. The Contractor shall be responsible for the preservation of the Department's project control points and benchmarks. The Contractor shall establish and preserve any temporary control points (traverse points or benchmarks) needed for construction. Any project control points (traverse points) or benchmarks conflicting with construction of the project shall be relocated by the Contractor. The Contractor as directed by the Engineer must replace any or all stakes that are destroyed at any time during the life of the contract. The Contractor shall re-establish centerline points and stationing prior to final cross-sections by the Engineer. The Vertical Control error of closure shall not exceed 0.035 ft times. The Horizontal Control precision ratio shall have a minimum precision of 1:20,000 feet of distance traversed prior to adjustment.
- (b) The Contractor shall perform construction centerline layout of all roadways, ramps and connections, etc. from project control points set by the Engineer. The Contractor using the profiles and typical sections provided in the plans shall calculate proposed grades at the edge of pavement or verify information shown on Grades and Geometric sheets.

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- (c) The Contractor shall advise the Engineer of any horizontal or vertical alignment revisions needed to establish smooth transitions to existing facilities. The Contractor must immediately bring to the attention of the Engineer any potential drainage problem within the project limits. The Engineer must approve any proposed variation in profile, width or cross slope.

- (d) The Contractor shall establish the working points, centerlines of bearings on bridge abutments and on piers, mark the location of anchor bolts to be installed, check the elevation of bearing surfaces before and after they are ground and set anchor bolts at their exact elevation and alignment as per Contract Plans. Before completion of the fabrication of beams for bridge superstructures, the Contractor shall verify by accurate field measurements the locations both vertically and horizontally of all bearings and shall assume full responsibility for fabricated beams fitting and bearing as constructed. After beam erection and concurrently with the Department project surveyors or their designated representative, the Contractor shall survey top of beam elevations at a maximum of 10-ft stations and compute screed grades. These shall be submitted to the Engineer for review and approval before the stay in place forms are set. Construction stakes and other reference control marks shall be set at sufficiently frequent intervals to assure that all components of the structure are constructed in accordance with the lines and grades shown on the plans. The Contractor will be responsible for all structure alignment control, grade control and all necessary calculations to establish and set these controls.

- (e) The Contractor, using contract plans, shall investigate proposed construction for possible conflicts with existing and proposed utilities. The Contractor shall then report such conflicts to the Engineer for resolution. All stakes for utility relocations, which will be performed by others, after the Notice to Proceed has been given to the Contractor, shall be paid for under item 763597

- Utility Construction Engineering.

- (f) The Contractor shall be responsible for the staking of all sidewalk and curb ramp grades in accordance with the plans and the Departments Standard Construction Details. The Contractor shall review the stakeout with the Engineer prior to construction. The Engineer must approve any deviation from plans, Department Standard Construction Details and Specifications in writing. The Contractor shall be responsible for any corrective actions resulting from problems created by adjustments if they fail to obtain such approval.

- (g) The Contractor shall be responsible for the staking of all drainage inlets in accordance with the plans and the Department Standard Construction Details. The offsets and top of grate elevations need to be calculated for each type of drainage inlet specified in the contract plans by the Contractor in order to line up the drainage inlet's flow line with the specified curb or ditch flow line as shown in the Contract Documents. The Engineer must approve any deviations from plans, Department Standard Construction Details and Specifications in writing. The Contractor shall be responsible for any corrective actions resulting from problems created by adjustments if they fail to obtain such approval.

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- (h) If wetland areas are involved and specifically defined on the Plans the following shall apply:
- i. It is the intent of these provisions to alert the Contractor, that he/she shall not damage or destroy wetland areas, which exist beyond the construction limits. These provisions will be strictly enforced and the Contractor shall advise his/her personnel and those of any Subcontractor of the importance of these provisions.
 - ii. All clearing operations and delineation of wetlands areas shall be performed in accordance with these Special Provisions. Before any clearing operation commences the Contractor shall demarcate wetlands at the Limits of Construction throughout the entire project as shown on the Plans labeled as Limits of Construction or Wetland Delineation to the satisfaction of the Engineer.
 - iii. The material to be used for flagging the limits of construction shall be orange vinyl material with the wording "Wetland Boundary" printed thereon. In wooded areas, the flagging shall be tied on the trees, at approximate 20-foot intervals through wetland areas. In open field and yard areas that have been identified as wetlands, 6 foot posts shall be driven into the ground at approximate 50-foot intervals and tied with the flagging. The flagging shall extend approximately 12 inches in length beyond the post. Posts shall be oak with cross sectional dimensions of 1 ½ inches to 2 inches by 1 ½ inches to 2 inches or ¼ inch rebar.
 - iv. If the flagging has been destroyed and the Engineer determines that its use is still required, the Contractor shall reflag the area at no cost to the Department. If the Contractor, after notification by the Engineer that replacement flagging is needed, does not replace the destroyed flagging within 48 hours, the Engineer may proceed to have the area reflagged. The cost of the reflagging by the Engineer will be charged to the Contractor and deducted from any monies due under the Contract.
 - v. At the completion of construction, the Contractor shall remove all posts and flagging.
 - vi. The Contractor shall be responsible for any damages to wetlands located beyond the construction limits, which occurs from his/her operations during the life of the Contract. The Contractor shall restore all temporarily disturbed wetland areas to their preconstruction conditions. This includes restoring bank elevations, streambed and wetland surface contours and wetlands vegetation disturbed or destroyed. The expense for this restoration shall be borne solely by the Contractor.
- (i) Whenever the Engineer will be recording data for establishment of pay limits, the Contractor will be invited to obtain the data jointly with the Engineer's Survey Crew(s) in order to agree with the information. If the Contractor's representative is not able to obtain the same data, then the information

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obtained by the Engineer shall be considered the information to be used in computing the quantities in question.

Submittals. All computations necessary to establish the exact position of all work from the control points shall be made and preserved by the Contractor. All computations, survey notes, electronic files, and other records necessary to accomplish the work shall be made available to the Department in a neat and organized manner at any time as directed by the Engineer. The Engineer may check all or any portion of the stakeout survey work or notes made by the Contractor and any necessary correction to the work shall be made as soon as possible. The Contractor shall furnish the Engineer with such assistance as may be required for checking all lines, grades, and measurements established by the Contractor and necessary for the execution of the work. Such checking by the Engineer shall not relieve the Contractor of his/her responsibility for the accuracy or completeness of the work. Copies of all notes must be furnished to the engineer at the completion of the project.

The Contractor shall submit any of the following at the Engineer's request:

- (a) Proposed method of recording information in field books to ensure clarity and adequacy.
- (b) A printout of horizontal control verification, as well as coordinates, differences and error of closure for all reestablished or temporary Control Points.
- (c) A printout of vertical control verification, with benchmark location elevation and differences from plan elevation.
- (d) Sketch of location of newly referenced horizontal control, with text printout of coordinates, method of reference and field notes associated with referencing control - traverse closure report.
- (e) Description of newly established benchmarks with location, elevation and closed loop survey field notes - bench closure report
- (f) All updated electronic and manuscript survey records.
- (g) Stakeout plan for each structure and culvert.
- (h) Computations for buildups over beams, screed grades and overhang form elevations.
- (i) A report showing differences between supplied baseline coordinates and field obtained coordinates, including a list of preliminary input data.
- (j) Any proposed plan alteration to rectify a construction stakeout error, including design calculations, narrative and sealed drawings.
- (k) Baseline for each borrows pit location.
- (l) Detailed sketch of proposed overhead ground mounted signs or signals showing obstructions that may interfere with their installation.
- (m) Copies of cut sheets.

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Machine Control Grading

This Section of the specification shall only be used if machine control is authorized for use on the project.

Description:

This specification contains the requirements for grading operations utilizing Global Positioning Systems (GPS).

Use of this procedure and equipment is intended for grading the subgrade surface; it is not intended for the use in constructing final surface grades.

The Contractor may use any manufacturer's GPS machine control equipment and system that results in achieving the grading requirements outlined in section 202 of the standard specifications. The Contractor shall convert the electronic data provided by the Department into the format required by their system. The Department will only provide the information outlined in this document and no additional electronic data will be provided.

The Contractor shall perform at least one 500 foot test section with the selected GPS system to demonstrate that the Contractor has the capabilities, knowledge, equipment, and experience to properly operate the system and meet acceptable tolerances. The engineer will evaluate and make the determination as to whether additional 500 foot test sections are required. If the Contractor fails to demonstrate this ability to the satisfaction of the Department, the Contractor shall construct the project using conventional surveying and staking methods.

Materials:

All equipment required to perform GPS machine control grading, including equipment needed by DelDOT to verify the work, shall be provided by the Contractor and shall be able to generate end results that are in accordance with the requirements of Division 200 - EARTHWORK of the Standard Specifications.

Construction:

A. DelDOT Responsibilities:

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1. The Department will set initial vertical and horizontal control points in the field for the project as indicated in the contract documents, (plans set). If the Contractor needs to establish new control points they shall be traversed from existing control points and verified to be accurate by conventional surveying techniques.
2. The Department will provide the project specific localized coordinate system.
3. The Department will provide data in an electronic format to the Contractor as indicated in the General Notes.
 - a. The information provided shall not be considered a representation of actual conditions to be encountered during construction. Furnishing this information does not relieve the Contractor from the responsibility of making an investigation of conditions to be encountered including, but not limited to site visits, and basing the bid on information obtained from these investigations, and the professional interpretations and judgments of the Contractor. The Contractor shall assume the risk of error if the information is used for any purpose for which the information is not intended.
 - b. Any assumption the Contractor makes from this electronic information shall be at their risk. If the Contractor chooses to develop their own digital terrain model the Contractor shall be fully responsible for all cost, liability, accuracy and delays.
 - c. The Department will develop and provide electronic data to the Contractor for their use as part of the contract documents in a format as indicated in the General

Notes. The Contractor shall independently ensure that the electronic data will function in their machine control grading system.

4. The Files that are provided were originally created with the computer software applications MicroStation (CADD software) and INROADS (civil engineering software). The data files will be provided in the native formats and other software

formats described below. The contractor shall perform necessary conversion of the files for their selected grade control equipment. The Department will furnish the Contractor with the following electronic files:

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- a. CAD files
 - i. Inroads -Existing digital terrain model (.DTM)
 - ii. Inroads -Proposed digital terrain model (.DTM)
 - iii. Microstation -Proposed surface elements - triangles
 - b. Alignment Data Files:
 - i. ASCII Format
5. The Engineer shall perform spot checks of the Contractor's machine control grading results, surveying calculations, records, field procedures, and actual staking. If the Engineer determines that the work is not being performed in a manner that will assure accurate results, the Engineer may order the Contractor to redo such work to the requirements of the contract documents, and in addition, may require the Contractor to use conventional surveying and staking, both at no additional cost to the Department.

B . Contractor's Responsibilities

1. The Contractor shall provide the Engineer with a GPS rover and Automatic Level, for use during the duration of the contract. At the end of the contract, the GPS rover and Automatic Level will be returned to the Contractor. The Contractor shall provide a total of 8 hours of formal training on the Contractor's GPS machine control system to the Engineer and up to three additional Department appointees per rover.
2. The Contractor shall review and apply the data provided by the Department to perform GPS machine control grading.
3. The Contractor shall bear all costs, including but not limited to the cost of actual reconstruction of work, that may be incurred due to application of GPS machine control grading techniques. Grade elevation errors and associated corrections including quantity adjustments resulting from the contractor's use of GPS machine control shall be at no cost to the Department.
4. The Contractor shall convert the electronic data provided by the Department into a format compatible with their system.

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5. The Contractor's manipulation of the electronic data provided by the Department shall be performed at their own risk.
6. The Contractor shall check and if necessary, recalibrate their GPS machine control system at the beginning of each workday in accordance with the manufacturer's recommendations, or more frequently as needed to meet the requirements of the project.
7. The Contractor shall meet the accuracy requirements as detailed in the Standard Specifications.
8. The Contractor shall establish secondary control points at appropriate intervals and at locations along the length of the project. These points shall be outside the project limits and/or where work is performed. These points shall be at intervals not to exceed 1000 feet. The horizontal position of these points shall be determined by conventional survey traverse and adjustments from the original baseline control points. The conventional traverse shall meet or exceed the Department's Standards. The elevation of these control points shall be established using differential leveling from the project benchmarks, forming a closed loop. A copy of all new control point information including closure report shall be provided and approved by the Engineer prior to construction activities. The Contractor shall be responsible for all errors resulting from their efforts and shall correct deficiencies to the satisfaction of the Engineer and at no additional cost to the Department.
9. The Contractor shall provide stakes at all alignment control points, at every 500 foot stationing, and where required for coordination activities involving environmental agencies and utility companies at the Contractor's expense. Work that is done solely for utility companies and that is beyond the work performed under item 763501 - Construction shall follow and be paid for under item 763597 -Utility Construction Engineering.
10. The Contractor shall at a minimum set hubs at the top of finished grade at all hinge points on the cross section at 500 foot intervals on the main line and at least 4 cross sections on side roads and ramps as directed by the engineer or as shown on the plans. Placement of a minimum of 4 control points outside the limits of disturbance for the excavation of borrow pits, Stormwater Management Ponds, wetland mitigation sites etc. These control points shall be established using conventional survey methods for use by the Engineer to check the accuracy of the construction.
11. The Contractor shall preserve all reference points and monuments that are identified and established by the Engineer for the project. If the Contractor fails to preserve these items the Contractor shall reestablish them at no additional cost to the Department.

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12. The Contractor shall provide control points and conventional grades stakes at critical points such as, but not limited to, PC's, PT's, superelevation points, and other critical points required for the construction of drainage and roadway structures.

13. No less than 2 weeks before the scheduled preconstruction meeting, the Contractor shall submit to the Engineer for review a written machine control grading work plan which shall include the equipment type, control software manufacturer and version, and proposed location of the local GPS base station used for broadcasting differential correction data to rover units.

14. The Contractor shall follow the guidelines set forth in the "Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques" and follow a minimum of Second Order Class 1, (2-I) classification standards.

Automated equipment operations have a high reliance on accurate control networks from which to take measurements, establish positions, and verify locations and features. Therefore, a strong contract control network in the field which is the same or is strongly integrated with the project control used during the design of the contract is essential to the successful use of this technology with the proposed Digital Terrain Model (DTM). Consistent and well designed site calibration for all machine control operations (as described below under Contract Control Plan) are required to ensure the quality of the contract deliverables. The Contract Control Plan is intended to document which horizontal and vertical control will be held for these operations. Continued incorporation of the Base Station(s) as identified in the Contract Control Plan is essential to maintaining the integrity of positional locations and elevations of features. The Contract Control Plan shall be submitted to the Department for review and approval by the Departments Survey Section 3 weeks prior to the start of any machine control work. The Contractor shall operate and maintain all elements of the Machine Grade Control continuously once the operations begin until otherwise approved by the Engineer.

Contract Control Plan:

The Contractor shall develop and submit a Contract Control Plan for all contracts which use Machine Control Grading. Contract control includes all primary and secondary horizontal and vertical control which will be used for the construction contract. Upon the Contractor's completion of the initial survey reconnaissance and control verification, but prior to beginning primary field operations, the Contractor shall submit a Contract Control Plan document (signed and sealed by the Delaware licensed Land Surveyor or Delaware Professional Engineer who oversees its preparation) for acceptance by the

Engineer, which shall include the following:

1. A control network diagram of all existing horizontal and vertical control recovered in the field as contract control.

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2. Include a summary of the calculated closures of the existing control network, and which control has been determined to have been disturbed or out of tolerance from its original positioning.
3. An explanation of which horizontal and vertical control points will be held for construction purposes. If necessary include all adjustments which may have been made to achieve required closures.
4. An explanation of what horizontal and vertical control (including base stations) was set to accomplish the required stakeout or automated machine operation. Include how the position of these new control points was determined.
5. Describe the proposed method and technique (technology and quality control) for utilizing the control to establish the existing and/or proposed feature location and to verify the completed feature location and/or measured quantity.
6. A listing of the horizontal and vertical datums to be used and the combined factor to be used to account for ellipsoidal reduction factor and grid scale factor.
7. If the Contractor chooses to use machine control as a method of measuring and controlling excavation, fill, material placement or grading operations as a method of measuring and controlling excavation, fill, material placement or grading operations, the Contractor Control Plan shall include the method by which the automated machine guidance system will initially be site calibrated to both the horizontal and vertical contract control, and shall describe the method and frequency of the calibration to ensure consistent positional results.
8. Issues with equipment including inconsistent satellite reception of signals to operate the GPS machine control system will not result in adjustment to the "Basis of Payment" for any construction items or be justification for granting contract time extension.

Method of Measurement:

The quantity of Construction Engineering will not be measured.

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Basis of Payment:

Payment will be made at the Lump Sum price bid for the item "Construction Engineering". The price bid shall include the cost of furnishing all labor, equipment, instruments, stakes and other material necessary to satisfactorily complete the work as herein described under this item for all roads and structures that are a part of the contract. Adjustment in payment will be made for the deletion or addition of work not shown in the contract documents.

Monthly payment will be made under this item in proportion to the amount of work done as determined by the Engineer.

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763503 - TRAINEE

Description:

The item shall consist of providing training in the construction crafts in accordance with the requirements stated in the General Notices of this proposal under the Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246).

Basis of Payment:

The payment for the item shall be made at a fixed rate of \$.80 per hour toward the hourly rate of the trainee.

8/15/17

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763508 - PROJECT CONTROL SYSTEM DEVELOPMENT PLAN

763509 - CPM SCHEDULE UPDATES AND/OR REVISED UPDATES

Description:

The Contractor shall plan, schedule and construct the Project by using a Critical Path Method Project Schedule (CPM) meeting the requirements of these specifications. Use the CPM for coordinating and monitoring the Work specified in the Contract Documents including all activities of Subcontractors, vendors, suppliers, utilities, railroads, the Department, and all other parties associated with the construction of the Contract. Include all Work in the CPM; including but not limited to submittals, major procurement, delivery, and construction activities. Include all activities, including bid items, quantified in the Contract Documents. Base the CPM upon the entirety of the Contract Documents. Utilize CPM software that generates files compatible with Primavera P6 Project Management Release: 7.0.0.

Scheduling Representative:

Designate a scheduling representative prior to submission of the Original Critical Path Method Project Schedule (OCPM). The scheduling representative is the person primarily responsible for development and maintenance of the CPM schedule; the Contractor's representative in all matters regarding the schedule; and the Contractor's designated attendee for all schedule related meetings. The scheduling representative shall also be knowledgeable of the status of all parts of the Work throughout the duration of the Project. Replacement of the scheduling representative will require written approval from the Engineer.

Submit the qualifications of the scheduling representative to the Engineer for approval. This approval is required before the OCPM will be accepted. The scheduling representative shall have at least three years of verifiable experience for preparing and maintaining CPM project schedules on Contracts of similar size and complexity.

Critical Path, Project Completion Date, and Float:

The critical path is defined as the series of activities in a CPM that has the longest path in time. The submitted activity sequence and durations must generate a CPM with only one critical path. Divide Project wide activities such as Maintenance of Traffic, Construction Engineering, or Temporary Erosion Control that, by their nature, generate long durations and complement other activities into "establish" and "conclude" activities to prevent this type of Work from occupying a significant portion of the critical path.

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The project start date, or initial data date, of the original CPM shall be the first chargeable day of Work. Nonproductive Work and administrative activities may begin and/or end prior to the project start date. The Original CPM must use all of the Contract Time and contain a critical path containing exactly zero float. Early completion schedules are not permitted. The schedule ending date of the Original CPM that uses all of the Project Time is the contract completion date.

Total Float is the difference between the schedule's finish date and the contract completion date. Free float is the difference in time between an activity's early finish and late finish. Free float is a shared commodity for the use of the Department and the Contractor and is not for the exclusive use or benefit of either party. Both parties have the full use of free float until depleted.

Submittal of the OCPM; the Start of Work and the Schedule of Record:

Complete and submit the proposed original CPM schedule (OCPM) database and the written narrative (WN) within 30 calendar days after Contract is Awarded. The WN is a description of any elements of the Schedule that deviate from the proposed construction sequence shown in the Contract Documents. Submit the OCPM in CPM format fully compatible with Primavera P6 Project Management Release: 7.0.0 by email or CD ROM as a single compressed database in CPM format.

The Engineer will complete the review of the OCPM within 30 calendar days after submittal. If required, a Joint Review Conference will be convened at which time the Engineer and Contractor may make corrections and adjustments to the proposed OCPM. If a revision is necessary due to the Engineer's review or the Joint Review Conference, submit the proposed revision within seven calendar days after receiving the Engineer's review comments or within seven calendar days after the date of the Joint Review Conference, whichever is the latest. Make revisions in accordance with the requirements for the OCPM. The Engineer will respond to the revised OCPM within seven calendar days after receipt. Clearly identify each submittal and resubmittal for clarity by labeling "2nd Draft", "3rd Draft", etc.

Do not start any Work until the OCPM is accepted. If the Engineer is ready to issue a Notice to Proceed but the OCPM is not yet accepted, the Engineer may issue the NTP and start Contract Time, but forbid Work to begin until the OCPM is accepted. The Engineer may partially accept a OCPM and allow Work to begin if the required corrections to the OCPM are minor, but the Engineer will not accept submittals that do not show the complete schedule. The Engineer will not pay any estimates until the OCPM is partially accepted. Once the OCPM is partially accepted, the Engineer will pay the first estimate. If the Contractor fails to make a good faith effort to address the Engineer's comments before the second estimate is due for payment, the Engineer will not pay the second estimate until a good faith effort is made by the Contractor to comply. The Engineer may not withhold an estimate payment if, within the estimate period in question, the Engineer has failed to provide timely review comments in response to the Contractor's submittal. The Engineer may, however, withhold the payment of subsequent estimates if the Contractor fails to make a good faith effort to address the Engineer's comments. Upon issuance of the Notice to Proceed, the start date utilized in the OCPM will be adjusted to comply with the first chargeable day of Work. Any delay in starting Work caused by the acceptance of the OCPM by the Engineer

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will not be considered as a basis for any adjustment in the Contract amount or time. For Contracts that have fast-tracked starts, the Engineer and the Contractor may agree to alter the response times and approval dates listed above.

Upon notification that the OCPM has been accepted, the corrected copy will become the CPM of record. The CPM of record shall be the Contractor's work plan for completing the entire Contract as specified in the Contract Documents.

Requirements for the OCPM:

The format of the OCPM database shall be the precedence diagram method with days as the planning unit and shall be based on Calendar Days. Use the Department's partially predetermined coding structure (CS) that is furnished by the Engineer.

Activity Sequencing. Activity sequence must be logical and representative of the Contractor's order of the Work. Successors and predecessors determine the schedule logic or activity sequence. A given activity cannot start until all of the given activity's predecessors have been completed. Use only finish to start dependency relationships (links); do not use lag times without approval from the Engineer. The Engineer may request that the Contractor resequence the activities to reflect realistic job logic. When scheduling using multiple resources, each resource unit shall have a corresponding activity. Durations of activities include all the time necessary to complete the activity including, but not limited to, Contractor's non-work periods (other than those shown on the calendars), reasonably foreseeable inclement weather, weekends and holidays. Base schedule calculations on retained logic, contiguous durations, and total float as finish float.

Activity Resources. Sequence activities to reflect resource apportionment. Logically connect and code each activity to reflect the crew (resource) performing the operation. Submit a summary list of crews, their crew codes, and their operation(s) with each schedule submission, unless unchanged. Identify responsibility for each activity. Identify Subcontractors, DBE's, utilities and Work performed by others that affects the Schedule.

Breakdown and Durations of Activities. An individual activity is required for each construction element or each activity not under the control of the Contractor that affects the sequence or progress of the Work. The Engineer reserves the right to require additional breakdown of the Work activities at any time. Each activity must be identified by a name, symbol and coding, and shall have a duration, sequence, responsibility and resource(s). Choose activity names that are descriptive and identify single construction elements. Activity symbols, or ID's, shall be unique and systematic.

Activity types must be either "task", "start milestone", or "finish milestone". Do not use "hammock" type activities. Date constraints, float and duration constraints, and/or flags for activities are not permitted.

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Assign a reasonable duration to each activity representative of its scope. Durations may not exceed 14 calendar days unless approved by the Engineer. Determine the duration of each activity by using productivity rates based on Calendar Days.

Include the preparation and approval of Working Drawings as activities. Include phasing (staging) milestones as activities. Correlate phasing milestones with the sequence of construction provided in the Contract Documents. Use a separate start and finish milestone activity to delineate each phase (stage).

Utility Work. Include all Work performed by utilities on the Project as activities in the OCPM. Include each utility item of Work shown in the Contract's Utility Statement as an activity. Durations for utility activities shall be the same as the durations shown in the Utility statement for each activity unless otherwise approved by the Engineer.

Calendars. Assign a calendar to each activity in the schedule. Use a minimum of 6 calendars, when applicable: (1) Full Schedule; (2) Permit Requirements; (3) Winter Condition; (4) Concrete Work; (5) Asphalt Paving Work; and (6) Nighttime Asphalt Paving Work. Use additional calendars if needed. Calendar non-work periods shall reflect the average Delaware weather history for the jobsite and the restrictions identified in the Contract Documents. The Contractor may choose perform Work during an activity's calendar non-work period at no additional cost to the Department if weather conditions are favorable for such Work and the Work does not violate a set forth in the Contract Documents. The maximum allowable non-work period for each calendar is set forth below. The Contractor may choose to shorten non-work periods at his/her discretion.

CALENDAR	MAXIMUM NON-WORK PERIOD
Full Schedule	None
Winter Condition	December 1 through March 15
Concrete Work	December 1 through March 15
Asphalt Paving	November 15 through March 15
Nighttime Asphalt Paving	October 15 through April 30

Written Narrative (WN). Provide a written narrative (WN) as part of the OCPM explaining the following:

- (a) Relationships between activities not obviously identified
- (b) Equipment usage and limitations.
- (c) Manpower usage and limitations.

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- (d) Use of additional shifts and overtime.
- (e) Activity codes, abbreviations, and activity identification system.
- (f) All calendars utilized in the CPM and the basis of determining each non-work period
- (g) All abbreviations.
- (h) Use of calendars.
- (i) Any other conditions that affect the schedule and are not readily discernible in the database.

CPM Updates:

Provide monthly updates to the CPM of record. Meet with the Engineer once a month prior to submitting the update to review the status of the schedule's activities. Prepare an updated list of activities showing all of the actual start and actual finish for each of the schedule's activities so that both parties can agree on the dates. Use the dates that were agreed upon in the meeting to status the CPM of record and submit the updated schedule to the Engineer for approval. Assign a unique file name to each update (Number/version). The data date of the update shall be the next day after the end of the update period. As part of the monthly update, submit a written description that identifies any delays or disruptions to the schedule experienced during the period of an update, any change in manpower or equipment, and any potential delays to the completion date of the schedule.

Do not include any revisions to the CPM without prior approval. Failure to submit complete updates in a timely manner may result in the withholding of estimates by the Engineer. The Engineer agrees to refrain from withholding estimates unless the Contractor is habitually late in providing updates, is more than four weeks late in submitting an update or has failed to submit an update that is part of a resolution to a serious problem that must be addressed immediately.

Revisions to the Schedule of Record:

Revisions are defined as any changes to the database other than status updates, log entries and moving the data date. Discuss any proposed revisions to the CPM verbally with the Engineer. If the revision is minor in nature, the Engineer may allow the revision to be included on the next Update of the CPM. If the Engineer determines that the revision is not minor in nature, submit the proposed revision for review and approval prior to deviating from the approved CPM. When a revision to the CPM is required due to changes in the Contract initiated by the Engineer, immediately contact the Engineer to discuss the changes. The Engineer may allow a deviation from the approved CPM for specific mitigating activities.

The Engineer may direct the Contractor to revise the schedule of record at the Contractor's expense if: the critical path has less than minus ten (-10) Calendar Days of total float due to the Contractor's failure to perform the Work in accordance with the schedule; the Contractor requests to re-sequence the Work; and/or the

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Contractor has performed a significant amount of Work out of sequence. The Engineer may direct the Contractor to revise the schedule for any other reason; and such a revision will be paid at the unit cost for a CPM Revision.

The Engineer will review and respond to the proposed revision within 7 Calendar Days after receipt. Resubmit, if required, within seven calendar days after receipt of the Engineer's review comments. The Engineer reserves the right to reject any proposed revision that adversely impacts the Department, utilities, or other concerned parties.

Extensions of Contract Time and/or Incentive/Disincentive Dates.

Make requests for extension of Contract time in writing and subject to the notice and timeliness of submission provisions as provided for elsewhere in the Contract. Requests for an extension of Contract time or change in an incentive/disincentive date will be evaluated by the Engineer's analysis of the CPM of record and any proposed revision submitted. Include in the request a written narrative of the events that impacted the schedule and a detailed explanation of why the Contractor cannot meet the requirements of the schedule of record. Only delays to activities that affect the Contract completion date or will be considered for an extension of Contract time. Only delays to activities that affect the completion duration of an incentive/disincentive period will be considered for an extension of an incentive/disincentive completion date. The extension of the specified Contract completion date or incentive/disincentive date will be based upon the number of Calendar Days the Contract completion date or incentive/disincentive date is impacted as determined by the Engineer's analysis. The Engineer and Contractor may agree to defer the analysis of a potential impact to the schedule until the completion of the activities that are affected. Such a deferment does not relieve the Contractor of his/her duty to identify potential impacts to the schedule in the applicable schedule updates.

All requests for extensions of Contract Time must be supported by the most recent CPM Update. If, within a reasonable period of time, the Contractor fails to make a good faith effort to produce an acceptable CPM update and uses an unacceptable CPM update to support a request for a time extension, the Contractor loses the right to receive that time extension; and/or the right to receive compensation for that delay caused in whole or in part by the Engineer.

Final As Built Schedule.

Submit a final CPM Schedule database within 14 Calendar Days of Substantial Completion. Failure to submit a final CPM Schedule may result in the withholding of estimates by the Engineer.

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Method of Measurement:

The Project Control System will be measured in two items. The item, "Project Control System Development Plan" will be lump sum. The item "CPM Schedule Updates and/or Revised Updates" will be measured one each per update that is submitted and accepted.

Basis of Payment:

The item, "763508 – Project Control System Development Plan" will be paid at the Contract's lump sum bid price on the next monthly estimate after completion of the requirements of the Project Control System Development Plan, which includes the approval of the Original CPM Schedule. Price and payment will constitute full compensation for preparing the CPM database, acquiring the necessary software, attending all scheduling meetings with the Department, submitting and resubmitting all documents and for all labor, tools, equipment and incidentals necessary to complete the Work.

The item, "763509 – CPM Schedule Updates and/or Revised Updates" will be paid at the Contract unit price per each approved CPM schedule update as described above. Price and payment will constitute full compensation for preparing, submitting and resubmitting all CPM updates, for attendance at all scheduling meetings with the Department, for preparing and reviewing a list of actual start and actual finish dates with the Engineer, and for all labor, tools, Equipment and incidentals necessary to complete the Work.

2/11/2015

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763599 - FIELD OFFICE, SPECIAL II

Description:

This Field Office, Special II item is a field office complex the work of which consists of erecting, furnishing, equipping, maintaining, and removing one (1) double wide modular field office unit, its entrance, and its adjacent parking area and one (1) single wide modular field office unit, its entrance, and its adjacent parking area. These field office units may be situated in different locations. The Contractor shall submit a specific location layout drawing and construction details for each field office, its entrance, and its parking area for approval by the Engineer. Each field office and its parking area shall be for the exclusive use of Department Officials, Engineers, Consultants, and Inspectors.

Each field office structure shall be free of asbestos and/or other hazardous materials. Each field office, its entrance, and its parking area shall be constructed and installed in accordance with all applicable city, county, state, and federal codes. The Contractor shall be responsible for obtaining all required licenses and permits for installation and placement of each field office, its entrance, and its parking area. The costs of obtaining such licenses and permits are to be incidental to the "Field Office, Special II" Item. Each field office shall be available for use by the Department continuously throughout the duration of the project.

Construction of and Equipment for the Field Offices:

The double wide field office shall be new and have a minimum floor space of 1,200 square feet with minimum exterior dimensions of 50'-0" length by 24'-0" width and the single wide field office shall be new and have a minimum floor space of 600 square feet with minimum exterior dimensions of 50'-0" length by 12'-0" width. The floor to ceiling height of each field office shall be nominal 8'-0". The exterior walls, ceiling, and floor of each field office shall be insulated. Each field office shall be of weather-proof construction, tightly floored and roofed, constructed with an air space above the ceiling for ventilation, supported above the ground, safely secured to its support if the support is an inground anchored foundation or otherwise by tie-downs to the ground, and fully skirted with rigid watertight covering overlapping the bottom of the exterior siding to the existing ground.

The Contractor shall provide entries to each field office by constructing a stair and deck platform with canopy at each exterior door. These entries shall be fabricated using treated dimension lumber, be constructed with hand and safety railing, be designed to last the life of the Contract, and conform to the requirements of the Architectural Accessibility Board and other federal, state and local boards, bodies and/or courts having jurisdiction in the Contract limits.

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The Contractor shall construct and maintain an all weather parking area adjacent to each field office of at least 6000) square feet and having a minimum of 12 functional parking spaces striped for full size cars. An entrance shall be constructed to each field office from its point of access to its parking area as determined by its approved location layout drawing and construction details, the cost to be incidental to the "Field Office, Special II" Item. All weather pathways from the parking area to the entrances of each field office shall also be constructed and maintained. This parking area and entrance pathways shall have a minimum of 2" type "C" hot mix on top of minimum 6" graded aggregate subbase. Snow and/or ice shall be removed from the entrance, the parking area, and the entrance pathways of each field office within 12 hours after each occurrence. Costs for furnishing, placing, and maintaining the aggregate base and hot mix, and for snow and/or ice removal, to be incidental to the "Field Office, Special II" Item.

The ground area 30'-0" from around the perimeter of each field office shall be landscaped and maintained. If the earthen grounds do not have a stand of weed free grass, the surface of this area shall be loosened to a depth of 4" and a satisfactory seedbed shall be prepared free of debris and extraneous matter. The area shall be seeded to a healthy stand of grass or sodded, after which the area shall be watered, mowed, and trimmed a minimum of three times a month during the growing seasons. Cost for this landscaping and maintenance is incidental to the "Field Office, Special II" Item.

Each field office shall have full carpeting, kitchenette facilities, and interior and exterior paneling, lighting, and plumbing fixtures. Each field office shall have a minimum of two (2) exterior doors, each door having a passage and a deadbolt lock. These door locks shall be keyed and at least 2 complete sets of keys shall be supplied to the Engineer's representatives. The exterior doors of each field office shall be insulated or have storm doors. Each field office shall have a minimum of six (6) windows, each window having a minimum glass area of 1,150 square inches and a horizontal mini-blind covering the full glass area. The windows of each field office shall be insulated or have storm windows, shall be equipped with a locking device, and shall have screens installed and repaired when damaged.

At least two (2) outside water service connections shall be provided at each field office. Each water connection shall have a 3/4" frost proof hose bib with vacuum breaker and shall include 100 linear feet of 5/8" minimum diameter reinforced, industrial or commercial grade, soft rubber hose per connection.

Each field office shall be provided with sufficient natural and artificial light and shall be adequately heated and cooled to provide comfortable working conditions.

Each field office shall have satisfactory lighting, electrical outlets, heating equipment, and exhaust fan and air-conditioning connected to an operational power source. Plan and drawing areas shall have individual fluorescent lights situated over their worktables. Replacement fluorescent lights shall be furnished as required. Electrical current, water, and any fuel for heating equipment shall be furnished and the cost of such shall be borne by the Contractor. Maintenance of the heating, exhaust fan, and air-conditioning equipment for each field office shall be provided for by validated service contracts for the length of the Contract. These service contracts shall allow a Department authorized project person to deal directly with the service organization to request repair.

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The Contractor shall furnish and maintain two fire extinguishers and provide one lighted "Exit" sign for each exterior passage door of the field offices. Fire extinguisher(s) may be chemical or dry power and shall be UL Classification 10-B:C(min.) and shall be suitable for Types A:B:C fires. A commercial or industrial type first aid and safety kit suitable for project conditions and hazards (including snakebite) shall be provided and maintained to full capacity on a monthly basis in each field office.

The Contractor shall provide an alarm system in each field office for security with electronic, direct connection to a security service provider. The security systems shall have interior motion, window, and entrance detectors and built in manual fire alarms. All windows of each field office shall be covered with steel bar grids as a deterrent to forced entry. The Contractor shall provide validated monitoring and service contracts for the length of the Contract for each field office. These contracts shall allow a Department authorized project person to deal directly with the security service provider to request service and/or repair.

The Contractor shall furnish and maintain in each field office an adequate supply of cold potable water, a minimum 23 cubic foot new refrigerator, and a minimum 900-watt new microwave oven. Maintenance of the potable water supply equipment, refrigerator, and microwave shall be provided for by validated service contracts for the length of the Contract. These service contracts shall allow a Department authorized project person to deal directly with the service organization to request repair.

Suitable indoor toilet facilities, conforming to the requirements of the State and Local Boards of Health or of other bodies or courts having jurisdiction in the area, shall be provided for each field office. When separate facilities for men and women are not available or required, a sign with the wording "Rest Room" {letter heights of 1" minimum} shall be placed over the doorway and an adequate positive locking system shall be provided on the inside of the doorway to insure privacy. The facility(s) shall be maintained by the Contractor to be clean and in good working condition and shall be stocked by the Contractor with adequate lavatory and sanitary supplies at all times during the period of the Contract.

For each field office the Contractor shall be responsible for performing or for making arrangements for all necessary telephone connections and/or for their maintenance; for providing a new telephone equipment system, for payment of all connections and the new telephone system equipment and its installation; and for final disconnection of the telephones.

The telephone system for the field offices shall have a total of 9 lines consisting of 8 direct single lines with call forward busy feature and 1 dedicated facsimile line and have 8 key sets consisting of 1 master key set having privacy feature, and 7 six-button key sets having privacy feature (1 set which may be for wall mounting), all for the official and exclusive use of the Engineer and other representatives of the Department. Location of telephone lines shall be as directed by the Engineer. Arrangement shall be made to allow a Department authorized project person to deal directly with the telephone company to report outages and/or request repair. The Contractor shall arrange for the installation and initial setup of the specified telephone system. Initial installation and setup costs shall be the responsibility of the Contractor as well. All subsequent monthly billings, after initial installation and setup, for each field office telephone system shall be received and paid by the

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Contractor. A copy of each of these subsequent bills shall be forwarded to the Project Resident for reimbursement on the contract pay estimate and the reimbursement will be for the amount of the bill only and shall not include any additional mark-up or profit.

For all other utilities, the Contractor shall be responsible for performing or for making arrangements for all necessary utility connections and/or for their maintenance; for payment of all utility connections, installations, service fees and bills; and for final disconnection of utilities.

The field office interiors shall be furnished by the Contractor. The Contractor shall provide new and maintain the following office furnishings, all which are to be approved by the Engineer prior to installation in the field office complex. Placement of these furnishings shall be as directed by the Engineer. These furnishings consist of 4 drafting tables with sufficient drawers for standard size plans, either attached to the tables or in cabinet form, each drafting table to have an ergonomic design spring back stool with five leg base having wheel casters, 9 full size office desks each with filing drawer and fully adjustable ergonomic design swivel chair with armrests and five leg base having wheel casters, 1 computer station with acoustical panels having minimum 60 NRC rating for privacy screen and fully adjustable ergonomic design swivel chair with armrests and five leg base having wheel casters, 1 large conference table for a minimum of 12 people with surrounding chairs with armrests, 4 folding tables minimum 6'-0" by 3'-0" each with ergonomic design straight back chair with armrests, 1 work table, 1 supply cabinet, 1 or more clothes closets of ample size to meet inspection manpower requirements, 4 rough plan racks, 4 legal size filing cabinets with 4 drawers, 2 legal size fire-resistant filing cabinets with lock and key with 4 drawers and meeting fire underwriters' approval for not less than one hour test, 2 stackable steel flat file cabinets for 43" by 32" size plan sheets each cabinet having 5 drawers with full suspension, rear hood, and hinged front depressor, 2 book shelves minimum 3'-6" by 4'-6" each, 3 vertical surface legal size three compartment pockets, 2 dry erase boards minimum 4' by 3' each with markers and erasers, and 2 cork bulletin boards minimum 3' by 2'. These office furnishings will remain the property of the Contractor at the conclusion of the project.

For each field office, the Contractor shall also furnish new and maintain the following office equipment, all which are to be approved by the Engineer prior to installation. The required equipment will enable the Department to synchronize project record keeping and office functions. The equipment shall be delivered in working and useable condition:

4 heavy-duty calculators having extra large 12-digit fluorescent display, full size keyboard with contoured keys, two-color ribbon printer, and AC powered;

1 Muratec MFX-2855D or Toshiba e-STUDIO 2330c or approved equal all-in-one copier which includes scanner, printer, and fax. Copier to have high speed wireless and network capability. Copier shall have all necessary software and cables for proper operation and shall be connected to high speed wireless and connected for use to share on a local network. Copier to have zoom and preset reduction and enlargement features, automatic two (2) sided copying, automatic document feeder with minimum 30 sheet capacity with automatic stapling capacity;

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1 micro cassette recorder, having fast playback, voice-activated system, three-digit tape counter, silent auto-stop and pause, two tape speeds, one-touch and follow-up, built-in condenser microphone, cue and review, and rechargeable with combination battery charger/AC adapter;

1 telephone answering machine having all-digital recording, 14 minute message capacity, selectable message time, voice prompt assistance, day/time stamp, call screening, two-digit LED message indicator, toll saver, power failure memory back-up, and message interrupt from any station; and

2 digital cameras with minimum 1/2.7" 4.0 mega pixel, 3X optical / 6X precision digital zoom, 12-bit DXP A/D conversion, 2.5" 123K pixel LCD display, 5-mode program AE and each with dual media slots, SXGA/XGA/VGA image resolution, E-mail mode. Also intelligent flash with red-eye protection, MPEG movie mode, clip motion, light metering, TEXT mode (GIF), playback zoom and resize, white balance, lithium battery system and in-camera picture effects, memory stick (minimum 256MB) capability, and storage case.

Consumables as required to manage the business of the project for each field office shall be provided for all office equipment for the length of the Contract. These consumables shall be furnished on request and shall include but not be limited to paper, tapes, ribbons, rolls, toner, cleaning kits, microcassette tapes and batteries, answering machine cassettes, camera batteries and memory sticks and/or discs, DVD and CD R/RW media, etc.

Maintenance of all office equipment in each field office shall be provided for by a validated service contract for the length of the Contract. This service contract shall allow a Department authorized project person to deal directly with the service organization to request repair.

Computer Requirements for Each Field Office:

Each field office shall have two (2) IBM compatible Microcomputer Systems both which will be furnished and maintained by the Contractor for use by the Engineer, the cost to be incidental to the "Field Office, Special II" Item. The specified computer systems will synchronize the construction management functions of the Department to monitor, report, and perform the accounting of the project work. The computer systems and all their related equipment specified below shall be furnished new and remain the property of the Contractor at the conclusion of the Contract. A detailed listing of the proposed computer systems and all their related equipment to be provided by the Contractor shall be submitted for approval by the Engineer prior to furnishing the Microcomputer Systems. The Microcomputer Systems shall be Laptop Computer Systems each with docking station, unless otherwise determined by the Engineer. In each field office both of the two (2) Microcomputer Systems shall consist of:

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Central Processing Unit (CPU) – Lap Top

Pentium M processor, 740 (1.7 GHz) or better with integrated USB 2.0 and IEEE 1394 ports (firewire) and wireless networking included,

Minimum 1.0 GB RAM with expansion capability to at least 3.0 GB and clock/calendar card equivalent, and

Microsoft "Windows® XP Professional" operating system;

Memory (Storage)

CD/DVD +/- RW with double layer write capability, and 80GB hard drive minimum, integrated Ethernet 10/100, and internal modem. Included software shall support double layer media writing and automatic backup of data;

Monitor (Cathode Ray Tube)

Monitor for docking station and docking station - Super Video Graphics Adapter (SVGA) minimum. 19" minimum diagonal visual area flat panel with .26 dot pitch capable of multiple frequency 256 color graphics and at least 1024 pixel resolution. Swivel base with low radiation and eyestrain protection, brightness and contrast control and

Laptop - shall have 15.4" display minimum;

Color Graphics Card

Card must be SVGA AGP interface with 64 MB onboard video memory having maximum resolution of at least 1280x720 with at least 16 bit color and video control hardware and software;

Keyboard

Keyboard shall be ergonomic, enhanced layout minimum with keyboard interface cable;

Contract No. T201907601.01

Printers

2 HP Color LaserJet CP3525n or Xerox Phaser 6280 or approved equal color printers with high speed wireless and network capability. Printers shall have all necessary software and cables for proper operation and shall be connected to high speed wireless and connected for use to share on a local network:

Software

The latest version programs for application management (operating system), word processing, spreadsheet, and anti-virus shall be provided with all user manuals. Upgrades, maintenance, and full technical support by the manufacturer shall be provided for the length of the Contract. The required software will enable the Department to synchronize accounting and record keeping functions between the project, District, and Department offices. A list of programs to be provided shall be submitted to the Engineer for approval. Software, other than for application management and anti-virus, is to be delivered unopened to the Department's administrative office. All software is to be compatible with and for use to run on "Windows® XP Professional". The required applications software follows and is to be latest version unless noted:

spreadsheet - "Lotus 1-2-3®",

suite - "Microsoft® Office XP Professional",

tracking - "Expedition®",

antivirus - Norton Systemworks™ 2004, and

software supporting creation of DVD +/- R/RW disks (supporting double layer media writing) and DVDR and DVDRW disks using DVDRW drive, for example: Ahead Nero, Roxio DVD/CD Creator, or some equivalent product. Note: software commonly included as part of the standard CDRW upgrade/standalone package is acceptable if included with the unit;

Related Equipment

Wireless networking hub/router, 802.11g or better, (or other high speed internet access) with all associated hardware (adapters, cables, etc) and software to enable wireless networking (or other high speed internet access) and internet connection sharing for all office computers and printers,

An electrical outlet with dedicated circuit for the main computer unit,

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An optical mouse with proper driving software having complete Microsoft emulation,

An internal 56/28.8/14.4 fax modem with MNP5 error checking and complete Hayes emulation having high-speed 14.4 fax capability and regular data transmission between 2400 and 56 baud, with the latest version proper driving software,

Necessary cables for proper operation,

An uninterruptible power supply (UPS) units for protection from power loss or fluctuation, minimum of 6 outlets, adequate to provide a minimum of 30 minutes backup power for an orderly shut down of the computer system with software and connections for automatic system shutdown,

24 bit Sound Blaster compatible PCI soundcard with quality desktop speakers,

A combination surge, spike, and noise protection device with receptacles for all peripherals (may be in combination with the UPS power supply),

A wrist rest suitable for use with the furnished keyboard,

Cleaning kits for disk drives,

An anti-glare filter with grounding wire suitable for use with the furnished monitor, and

All cards, hardware, and operating, anti-virus, and equipment software to be fully installed and operational;

Maintenance and Service

Maintenance of all specified equipment and components shall be provided for by a validated service agreement for the length of the Contract. Maintenance (upgrades, replacement, full technical support) for each software application shall be provided for by validated maintenance agreement for the length of the Contract. These agreements shall allow an authorized project person to deal directly with the service organization to request repair or the maintenance organization to request assistance; and

Contract No. T201907601.01

Supplies

Consumables as required to manage the business of the project shall be provided for the Microcomputer Systems in each field office for the length of the Contract. These consumables shall be furnished on request and include but not be limited to 3-1/2" double sided high density micro floppy diskettes, compatible diskettes for provided digital cameras and memory stick media, DVDR and DVDRW media compatible supporting operational minimum to maximum speed of the DVD/RW drive unit, cut sheet paper and labels compatible with the printers, hardware and screen cleaners, and toner cartridges.

Maintenance Requirements for Each Field Office:

Maintenance of each field office including its entrance and adjacent parking area, for the time required, shall consist of maintenance and/or replacement of all provided items, security system, furniture and equipment, computer systems, providing lavatory supplies, providing trash containers and waste baskets, providing entrance mats at each door, providing replacement items for lighting fixtures, maintaining all utilities, providing vermin and pest control by professional exterminator(s), providing satisfactory and sanitary janitorial and waste disposal services twice a week, providing cleanup of trash and debris on the parking lot and landscaped area once a week, and shall be included in the monthly unit cost.

The Contractor shall provide and deliver for each field office a current copy of all validated field office equipment and computer maintenance, service, assistance and/or monitoring agreements and/or contracts as mentioned hereinabove to the Department's administrative office on or before the first day each field office is ready for use.

Method of Measurement:

This item will not be measured but will be paid for on a monthly basis. Partial months will be paid at the rate of 0.033 months per day.

Basis of Payment:

The field office complex will be paid for on a unit price bid per month, which price shall be full compensation for performing the work specified and the furnishing of all materials, labor, tools, equipment and incidentals necessary to maintain each field office, their entrance, and their adjacent parking area and restore each field office area, entrance, and adjacent parking area to match their original site condition. No separate payment will be made for costs involved for removing hazardous material or underground tanks to install these field offices, their entrances, and their parking areas. One (1) unit of payment will constitute erecting, furnishing,

Contract No. T201907601.01

equipping, maintaining, and removing one (1) double wide field office and one (1) single wide field office and their entrances and parking areas.

Payment will be made only for the actual number of months that the field office complex is acceptably provided by the Contractor.

The field offices, their entrances, and their parking areas shall be ready for use not later than forty-five (45) calendar days after the date of the fully executed Contract and before construction operations begin.

1/19/10

Contract No. T201907601.01

850532 - TEMPORARY LIGHTING

Description:

The item consists of designing, coordinating, furnishing all materials, and installing temporary lighting in accordance with the locations, notes, and details shown on the Plans, this Special Provision, and/or as directed by the Engineer.

Materials:

The Contractor shall furnish all the materials for each temporary lighting unit including but not limited to, 40 ft Class III Wood Poles, Triplex Service Cable Dead End Attachments, luminaire mounting supports and hardware, LED floodlight luminaire; and perform such and related work including installation and removal of wood poles, electric service on wood pole, removing the dead end and intermediate cable attachments, installation and removal of luminaries.

The poles shall be 40 ft Class III Wood Poles. The pole shall be set with the bottom approximately seven feet below grade. The nominal mounting height of the luminaire shall be at least 30 ft above the surface being illuminated.

The mounting hardware shall be aluminum or galvanized steel and be suitable for attachment to wooden poles. The arms are to be fastened to the poles by means of galvanized bolts. The bolts shall pass thru the mounting flange of the support, thru the pole and have a galvanized washer and nut on the other end.

The support shall meet or exceed the "Standard Specifications for Structural Support for Highway Signs, Luminaries and Traffic Signals".

All wiring for the electric service installation and the wiring for the individual luminaries shall be the responsibility of the Contractor. All wiring shall conform to the National Electric Code.

The new LED floodlight luminaire shall be of a wattage, lumen output and distribution necessary to provide the required illuminance levels noted in this Special Provision. The CRI shall be a minimum of 70, and the color temperature shall be between 3,000K and 4,500 K

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The temporary lighting system shall be controlled by a photoelectric cell installed on each luminaire or at the control center location. The photoelectric control unit shall be rated at 1800 voltampere and 105-285 volt and shall have adjustable turn "On" and "Off" settings of 2.0 +20% FC and 5.0 to 7.0 +20% FC, respectively. The photoelectric control "On" and "Off" setting for dawn to dusk operations shall be preset at the factory to insure an accurate and uniform operation of all units. The photoelectric control unit shall be held in a locking type mounting receptacle prewired to quick disconnect plugs, with both of these prewired to a terminal board so that the luminaire may be energized simply by installing wire connections to the terminal board.

Ground rods shall be copper clad steel 3/4" diameter 10' long, complete with ground clamp and square head bolt, equal to Joslyn's Catalog No. J8350, Line Material Catalog No. 119960 or A. B. Chance Co., Catalog No. 8450.

Various other materials to be used for electrical work, such as the conduit grounding bushings, expansion fittings, grounding studs, anchor bolt assemblies for lighting standards, etc., shall conform to the National Electric Code.

Aluminum castings shall be manufactured in accordance with the requirements of ASTM B108.

Materials which are required but not covered in this Special Provision shall meet the material requirement of the Standard Specifications.

Construction Methods:

The Plans show, in general, a conceptual layout with the location and installation details of various electrical and relocated work to be performed under this Contract. It is the Contractor's responsibility to validate the conceptual layout by performing design and submitting it for approval following the procedure noted below.

It is the Contractor's responsibility to provide, at least sixty days prior to the installation of the Temporary Lighting, Temporary Lighting Design drawings to the Department for their review and approval. The Temporary Lighting Design drawings shall include the following:

1. Layout drawings showing the location of all temporary lighting equipment.
2. Details of lighting and electrical equipment to be used.
3. Details of electrical power source.
4. Specific technical details including catalog cuts on all lighting fixtures to be provided, including power rating and photometric charts.

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5. Details of any hoods, louvers, shields or other means to control glare.
6. Lighting calculations confirming that the illumination requirements will be met by the Contractor's temporary lighting design.
7. Other design plans and details are requested by the Department to validate and approve the Contractor's temporary lighting design.

The layout drawings shall be on sheet size approved by the Engineer and at an appropriate scale to adequately describe the work. Layout drawings must be submitted and approved for all Phases of Construction.

The Temporary Lighting design shall provide at least 5.0 average maintained foot-candles with an average / minimum uniformity ratio of approximately 15:1 or less across the pavement of the court.

When there is no longer a requirement on the site for the temporary lighting units, the wood poles and luminaries shall become the Contractor's property.

The Contractor shall coordinate all the necessary activities for electrical power with the owner of the Electrical Utility in the area and obtain the required electrical service.

It is the Department's intent to provide a continuously operating temporary lighting system. Should an operational problem be reported to the Contractor at any time during use of the unit, the Contractor shall have 30 minutes after receipt of notification to rectify the problem to the Engineer's satisfaction. Failure of the Contractor to make this effort may result in deduction of payment for the time the system is not satisfactorily operating. To this end, the Contractor shall designate an on-site representative, other than the Project Superintendent, who shall be the Department's contact person on all issues related to the temporary lighting system. The Contractor shall also designate a Manufacturer's Representative to be on call for technical assistance or as otherwise necessary.

Basis of Payment:

Payment for the temporary lighting shall be made at the lump sum unit price for the "Temporary Lighting" item, which price and payment shall constitute full compensation for designing, coordination, furnishing and installing all materials including, but not limited to, all the work and materials mentioned above in this Special Provision; for all switches, hardware, attachments, appurtenances and incidentals necessary to make the temporary lights safe, operational and functional, during the period required on the job, for removal of all materials when no longer required and for all labor, tools and equipment necessary to complete the item.

Contract No. T201907601.01

The Contractor shall be responsible for all electrical connection and service charges required for the temporary lighting and shall make payments directly to the Electrical Utility Company.

7/29/2019

STATEMENTS

Included on the following pages:

UTILITY STATEMENTS

RIGHT-OF-WAY STATEMENTS

ENVIRONMENTAL STATEMENTS

RAILROAD STATEMENTS



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

JENNIFER COHAN
SECRETARY

UTILITY STATEMENT
May 11, 2020
State Contract No. T201907601
P6 No. 19-07601
F.A.P. No. EBHN-S014(22)
BR 3-155 N&S on SR1 over Broadkill River
Sussex County, Delaware

The following utility companies may own and/or maintain facilities within the project limits:

Artesian Wastewater
Comcast Cable Communications
Delaware Electric Cooperative, Inc
Verizon Delaware, LLC - Communications

The following is a breakdown of the Utilities involved, adjustments and/or relocations as required:

Artesian Wastewater:

The Company maintains underground sewer facilities within the project limits with no anticipated conflicts.

Artesian maintains an 8" PVC force main that runs along the east side of SR1, from the northern project limits, down Paynter/Lockerman Road, under Broadkill, and ties back into SR1. The main crosses under SR1 from the east to the west side at approximate station 2248+60 where it continues south along the west side of SR1. The crossing of SR1 is in a 16" steel casing. These facilities will remain in place and active for the duration of this contract.

Comcast Cable Communications:

The Company maintains aerial and underground communications facilities within the project limits with no anticipated conflicts. These facilities will remain in place and active for the duration of this contract.

Delaware Electric Cooperative, Inc:

The Company (DEC) maintains aerial and underground electric facilities within the project limits. There are no apparent conflicts. These facilities will remain in place and active for the duration of this contract.

The aerial line runs from the southern project limits, on the west side of SR1, to a pole at approximate station 2246+85 where it goes underground across SR1 and comes up a pole on the east side of SR1, but on the west side of Lockerman Road. DEC maintains underground services south of this pole.

The aerial line continues north, along the west side of Lockerman Road, across Broadkill and along the west side of Paynter Road to a pole at approximate station 2276+00 where it crosses under SR1 and comes up a pole on the west side of SR1 and continues north outside of the project limits. There are additional underground and aerial service feeds from the pole on the east side of SR1.

The highway contractor will be responsible for contacting DEC to obtain a service location and feed for the required temporary lighting. This includes submitting all applications and performing required coordination for the temporary lighting. DEC will require thirty (30) calendar days for coordination and review of the highway contractor's application prior to installation of any lighting.

DEC also maintains a service for the existing navigation lights on the bridge. The service location (Pole 161966 at Lockerman Road) and transformer will not change but the location of the existing service panel and pedestal will be relocated, by the highway contractor. New conduit and wiring will be required only at the connection to the equipment and shall be installed by the highway contractor per plan. The highway contractor is to coordinate any required service or meter work for the navigation lights with DelDOT Signal Construction and DEC at least thirty (30) calendar days prior to performing any work. This coordination will determine if service applications are needed and what entity will be responsible for submitting.

Verizon Delaware, LLC:

The Company maintains buried communications facilities along SR1 within the project limits.

Verizon maintains buried facilities along the east side of SR1 from a pedestal at station 2240+29, Rt 57', extending southeast and beyond the project limits.

Verizon maintains buried facilities along the east side of SR1 from a pedestal at station 2240+29, Rt 57', extending northwest and continuing along Lockerman Road and beyond the project limits.

These facilities will remain in place and active for the duration of this contract.

General Notes

1. The Contractor's attention is directed to Section 105.09 Utilities, Delaware Standard Specifications, August 2016. The Contractor shall contact Miss Utility (1-800-282-8555) two working days prior to any excavation. The Contractor is responsible for the support and protection of all utilities when excavating. The Contractor is responsible for ensuring proper clearances, including safety clearances, from overhead utilities for construction equipment. The Contractor is advised to check the site for access purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.
2. The information shown in the Contract Documents, including the Utility Statement and the Utility Schedule contained herein, concerning the location, type and size of existing and proposed utilities, their locations, and construction timing has been compiled by the preparer based on information furnished by each of the involved Utility Companies. It shall be the responsibility of the State's Contractor to verify all information and coordinate with the Utility Companies prior to and during construction, as specified in Section 105.09 of the Standard Specifications.
3. It is understood and agreed that the Contractor has considered in his bid all permanent and temporary utility appurtenances in their present and relocated positions as shown on the plans or described in the Utility Statement or are readily discernible and that no additional compensation will be allowed for any delays, inconvenience, or damage due to any interference from the utility facilities and appurtenances or the operation of moving them, except that the Contractor may be granted an equitable extension of time. The contractor's means and method of construction are not taken into account when known utility conflicts are identified. If the Contractor's means and method of construction create a utility conflict the Utility Statement will prevail in discussions with the utility and the Contractor. The State's Contract shall be responsible for any costs associated with any temporary outages; holding, bracing and shielding of utility facilities; temporary relocations; or permanent relocations that are not specifically identified in this utility statement or shown in the contract plan set.
4. Coordination and cooperation among the Utility Companies and the State's Contractor are of prime importance. Therefore, the Contractor is directed to contact the following Utility Company representatives with any questions regarding this work prior to submitting bids and work schedules. Proposed work schedules should reflect the Utility Companies' proposed relocations. The Utility Companies do not work on weekends or legal holidays.

NAME	COMPANY	PHONE	EMAIL
Wayne Tyler	Artesian Wastewater	(302) 453-6987	wtyler@artesianwater.com
Mike Sullivan	Comcast Cable Communications	(302) 841-6316	mike_sullivan2@comcast.com
Tom Wright	Delaware Electric Cooperative, Inc.	(302) 349-3130	Twright@decoop.com
George Zang	Verizon Delaware LLC	(302) 422-1238	George.w.zang@verizon.com

5. As outlined in Chapter 3 of the DelDOT Utilities Manual, individual utility companies are responsible for obtaining all required permits from municipal, State and federal government agencies and railroads. This includes but is not limited to water quality permits/DNREC Water Quality Certification, DNREC Subaqueous Lands/Wetlands permits, DNREC Coastal Zone Consistency Certification, County Floodplain permits (New Castle County only), U.S. Coast Guard permits, US Army Corps 404 permits, sediment and erosion permits, and railroad crossing permits.
6. Individual utility companies are required to restore any areas disturbed in conjunction with their relocation work. If an area is disturbed by a utility company and is not properly restored, the Department may have the highway contractor perform the necessary restoration. Any additional costs incurred as a result will be forwarded to the utility company.
7. 16 Del. C. § 7405B requires notification to and mutually agreeable measures from the public utility operating the electric line for the any person intending to carry on any function, activity, work or operation within dangerous proximity of any high voltage overhead electric lines. All contractors/other utilities must also maintain a distance of 10'-0" from all energized lines.
8. Any existing facilities that are comprised of hazardous materials will be removed by the Utility Company unless otherwise outlined in the contract documents or language above. Any existing facilities containing hazardous materials will be purged by the Utility Company unless otherwise outlined in the contract documents or language above.

PREPARED AND RECOMMENDED BY:



Century Engineering, Inc.
Dane Mayorga, dmayorga@centuryeng.com

05/12/2020

DATE

APPROVED AS TO FORM BY:



Utilities Section, DelDOT
Eric Cimo, eric.cimo@delaware.gov

5/13/20

DATE

**STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
PO BOX 778
DOVER, DELAWARE 19903**

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201907601

F.A.P. NO. EBHN-S014(22)

**REHABILITATION OF BRIDGE NOS. 3-155N AND 3-155S
ON SR 1 OVER BROADKILL RIVER**

SUSSEX COUNTY

Certificate of Right-of-Way Status – 100%

Level 1

As required by 23 CFR, Part 635, and other pertinent Federal and State regulations or laws, the following certifications are hereby made in reference to this highway project:

All project construction or work shall be performed within existing rights of way and permanent easements; and

All necessary real property interests, including control of access rights when pertinent, were acquired as part of previous highway projects, and include legal and physical possession; and,

This project does not cause any persons to be displaced as defined in 49 CFR, Part 24; and,

The State has the right to remove, salvage, or demolish any improvements or personal property that may be located within project limits.

RIGHT OF WAY SECTION



Monroe C. Hite, III
Chief of Right of Way

March 24, 2020



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

JENNIFER COHAN
SECRETARY

April 6, 2020

STIPULATED

ENVIRONMENTAL REQUIREMENTS

FOR

State Contract No. T201907601
Federal Aid No.: EBHN-S014(22)

Contract Title: BR 3-155 N&S on SR 1 over Broadkill River

In accordance with the procedural provisions (40 CFR parts 1500-1508 and 23 CFR part 771) for implementing the National Environmental Policy Act of 1969 (42 U.S.C. §§ 4321-4370h), as amended, the referenced project has been processed through the Department's Environmental Review Procedures and the 2018 Programmatic Agreement between the Federal Highway Administration, Delaware Division and the Delaware Department of Transportation Regarding the Processing of Actions Classified as Categorical Exclusions for Federal-Aid Highway Projects. As such, a Categorical Exclusion (CE) has been prepared to evaluate potential effects on the human environment resulting from construction of the proposed project.

Class II Action / Level C
CE action: **23 CFR 771.117(c)(28)**

Environmental (NEPA) Approval Date: 2/10/2020

PERMIT REQUIREMENTS:

The construction work that will occur to BR 3-155N&S on SR 1 over Broadkill River requires permit approval from the agencies listed below. It is the responsibility of the contracting agency -- the Delaware Department of Transportation, Division of Transportation Solutions -- to obtain the necessary permits to ensure that the contractor complies with the requirements and conditions established by the regulatory agencies. The permit coordination for this project is ongoing. Written authorization from the permitting agencies is required and



paperwork for on-site posting is anticipated. As such, the construction work that will occur is authorized under the permits/exemptions listed below:

REQUIRED PERMITS AND APPROVAL STATUS:

- U.S. Army Corps of Engineers (COE) - Nationwide Permit (NWP) # 23 - **PENDING**
- Delaware Department of Natural Resources and Environmental Control (DNREC) – Subaqueous Lands Permit - **PENDING**
- DNREC Water Quality Certification (WQC) – Issued, project is not located in a Critical Resource Water
- DNREC Coastal Zone Management (CZM) – Issued, project is not located in a Critical Resource Water
- City of Newark - Public Works and Water Resources and the Planning Department Floodplain Permit - **PENDING**

SPECIFIC REQUIREMENTS:

Compliance with all requirements of the permits is the responsibility of the contractor, who will follow all special conditions or requirements as stated within those permits. The contractor will be subject to penalties, fines, and the risk of shut down as mandated by laws governing permitting agencies if such conditions and requirements are violated or ignored. Therefore, all special conditions, general requirements, and/or other required provisions specified within the permits must be followed. Those obligations are indicated or listed within the permit package, which can be obtained from the DelDOT Contract Administration Office.

Additional requirements by DelDOT not specified within the permits, but listed below, are also the responsibility of the contractor. Noncompliance with these requirements may result in shut down of the project at the contractor's expense.

1. The contractor shall employ measures during construction to prevent spills of fuels or lubricants. If a spill should occur, efforts shall be undertaken to prevent its entry into wetlands, aquatic, or drainage areas. Any spills entering wetlands, aquatic, or drainage areas shall be removed immediately. The Division of Water Resources (DNREC), Wetlands & Aquatic Protection Branch, 302-739-4691, shall be notified of any spill(s) within six (6) hours of their occurrence. That office will determine the effectiveness of spill and contamination removal and specify remediation efforts as necessary.
2. All construction debris, excavated material, brush, rocks, and refuse incidental to the work shall be placed either on shore above the influence of flood waters or on some suitable disposal site approved by the department.

3. The disposal of trees, brush, and other debris in any stream corridor, wetland surface water or any drainage ditch is prohibited.
4. There shall be no stockpiling of construction materials or temporary fills in wetlands or subaqueous lands unless otherwise specified on project plans and approved by permitting agencies that govern them. It is the contractor's responsibility to coordinate and secure those additional permits/amendments in deviating from the plan.
5. Construction debris shall be kept from entering adjacent waterways, wetlands, ground cover, or drainage areas. Any debris that enters these areas shall be removed immediately. Netting, mats, or establishing confined work areas in stages may be necessary to address these issues.
6. Refuse material resulting from routine maintenance of worker equipment and heavy machinery is prohibited from being disposed or deposited onto or into the ground. All used oils and filters must be recycled or disposed of properly.
7. Use of harmful chemical wash water to clean equipment or machinery is discouraged. If undertaken, the residue water and/or material must be collected or contained such that it will be disposed of properly. It shall not be deposited or disposed of in waterways, streams, wetlands, or drainage areas.
8. The contractor shall follow all requirements as indicated in the Environmental Compliance Sheet. It is the contractor's responsibility to ensure that workers also follow this requirement. If applicable, as part of the restrictions, please note the timetables reflected in the contract for the in-stream/water work for endangered species protection.
9. Fill material shall be free of oil and grease, debris, wood, general refuse, plaster and other pollutants, and shall contain no broken asphalt.

ENVIRONMENTAL COMPLIANCE SHEET:

The contractor shall pay special attention to specific construction requirements as indicated in the Environmental Compliance Sheet.

1. Specifically, please note the environmental requirements as indicated on sheet 162:
 - Note 2B:
 - Fisheries – to protect diadromous fish migrations/spawning, no in-water shall occur from March 1 to June 30 (inclusive). Barges are allowed during this period but must remain anchored and stationary.
 - Endangered Species – to protect Atlantic and Shortnose Sturgeon:
 1. From vessel strikes, project vessel speeds must remain below 10 knots;
 2. The number of project vessels must be limited to the greatest extent possible; and
 3. Turbidity control measures must be designed to not entangle or entrap these species

- Note 3 on for Cultural Resources
- Note 4 for Restoration
- Note 5 for Protection of Resources
 - Specifically 5D: Essential Fish Habitat – Project Vessels shall be operated in adequate water depths to avoid propeller scour and grounding at all tides. Shallow draft vessels will be used in shallow areas to maximize the navigational clearance between the vessel and the bottom substrate. Spuds may be used to elevate the vessel.
 - Specifically 5E: To protect aquatic species (including eggs) from impingement and/or entrainment, temporary intakes related to construction occurring from March 1 to October 31 must be equipped with 2 millimeter (mm) wedge wire screens with a maximum intake velocity of 0.5 feet per second (ft/sec). Payment for the screens will be incidental to Item 909005 Stream Diversion. Contractor may choose from any of the following approved products, and alternative products will not be considered:
 - LAKOS Filtration Solutions: PC-Self Cleaning Intake Screen (<https://www.lakos.com/product/pc-series-self-cleaning-intake-screen/>)
 - Federal Screen Products Inc. Intake Screen (<https://www.federalscreen.com/intake-screens>)
 - Hendrick Screen Company: Passive Water Intake Wedge Wire Screens (<https://www.hendrickcorp.com/screen/markets/water-intake-water-treatment/>)
 - Big Brand Water Filter, Inc: Self-Cleaning Pump Intake Screens PC-915 (https://www.bigbrandwater.com/Self-Cleaning-Pump-Intake-Screens-PC-915_p_17721.html)

2. DelDOT Environmental Studies Section (302) 760-2264 or DOT_EnvironmentalStudies@delaware.gov must be notified if there are any changes to the project methods, footprint, materials, or designs, to allow the Department to coordinate with the appropriate resource agencies (COE, DNREC, and SHPO), for approval.



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
 800 BAY ROAD
 P.O. BOX 778
 DOVER, DELAWARE 19903

JENNIFER COHAN
 SECRETARY

RAILROAD STATEMENT

For

State Contract No.: T201907601

Federal Aid No.: EBHN-S014(22)

Project Title: BR 3-155 N&S on SR1 over Broadkill River

The following railroad companies maintain facilities within the contract limits:

- | | |
|--|---|
| <input type="checkbox"/> Amtrak | <input type="checkbox"/> Maryland & Delaware |
| <input type="checkbox"/> CSX | <input type="checkbox"/> Norfolk Southern |
| <input type="checkbox"/> State of Delaware
Delmarva Central | <input type="checkbox"/> Wilmington & Western |
| <input type="checkbox"/> East Penn | <input type="checkbox"/> Delmarva Central |
| | <input checked="" type="checkbox"/> None |

DOT Inventory No.: N/A No. Trains/Day: N/A Passenger Trains (Y / N): N/A

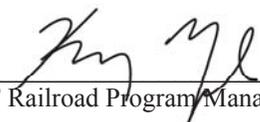
In accordance with 23 CFR 635, herein is the railroad statement of coordination (check one):

- No Railroad involvement.

- Railroad Agreement unnecessary but railroad flagging required. The contractor shall follow requirements stated in the DelDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DelDOT's Railroad Program Manager at (302) 659-4060.

- Railroad Agreement required. The necessary Railroad Agreement is pending. The Contractor cannot begin work until the Agreement is complete and fully executed. Railroad related work to be undertaken and completed as required for proper coordination with physical construction schedules. The Contractor shall follow requirements stated in the DelDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DelDOT's Railroad Program Manager at (302) 659-4060.

Approved As To Form:



 DelDOT Railroad Program Manager

10/21/19

 DATE



Delaware Department of Transportation
Quantity Sheet Summary

Proposal ID: T201907601

Project Descripton: BR 3-155N&S on SR1 over Broadkill River

NOT TO BE USED FOR BIDDING

Item Number	Description	Unit	Quantity
763508	PROJECT CONTROL SYSTEM DEVELOPMENT PLAN	LS	1
763509	CPM SCHEDULE UPDATES AND/OR REVISED UPDATES	EAMO	12
763599	FIELD OFFICE, SPECIAL II	EAMO	12
801000	MAINTENANCE OF TRAFFIC	LS	1
803001	FURNISH AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN	EADY	215
804001	FURNISH AND MAINTAIN PORTABLE LIGHT ASSEMBLY (FLOOD LIGHTS)	EADY	110
805001	PLASTIC DRUMS	EADY	40000
806001	TRAFFIC OFFICERS	HOUR	500
807001	FURNISH AND INSTALL TEMPORARY PORTLAND CEMENT CONCRETE SAFETY BARRIER, UNPINNED	LF	4200
807004	RELOCATE TEMPORARY PORTLAND CEMENT CONCRETE SAFETY BARRIER, UNPINNED	LF	100
807007	REFLECTOR PANELS	EACH	110
808002	FURNISH AND MAINTAIN TRUCK MOUNTED ATTENUATOR, TYPE II	EADY	200
809001	INSTALL TEMPORARY IMPACT ATTENUATOR	EACH	3
809005	FURNISH TEMPORARY IMPACT ATTENUATOR - NON-GATING, REDIRECTIVE, TEST LEVEL 3	EACH	3
810001	TEMPORARY WARNING SIGNS AND PLAQUES	EADY	11500
720015	BRIDGE RAIL RETROFIT, TYPE 2	LF	40



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610016	PORTLAND CEMENT CONCRETE MASONRY, CLASS D	CY	44
817015	PREFORMED RETROREFLECTIVE THERMOPLASTIC MARKINGS, BIKE SYMBOL	EACH	4
824001	BARRIER MOUNTED DELINEATOR	EACH	16
813001	TEMPORARY BARRICADES, TYPE III	LFDY	17500
817002	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC	SF	300
817004	TEMPORARY MARKINGS, PAINT, SYMBOL/LEGEND	SF	275
817013	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	LF	96000
817018	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 3"	LF	800
817027	RAISED/RECESSED PAVEMENT MARKER	EACH	160
817031	REMOVAL OF PAVEMENT STRIPING	SF	35000
819018	INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE SIGN POST	EACH	77
819019	INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS	SF	169
830002	CONDUIT JUNCTION WELL, TYPE 4, 20" X 42-1/2" PRECAST CONCRETE	EACH	16
830004	CONDUIT JUNCTION WELL, TYPE 7, 36" X 60" PRECAST POLYMER CONCRETE	EACH	4
831002	FURNISH AND INSTALL UP TO 4" SCEDULE 80 HDPE CONDUIT (BORE)	LF	300
763503	TRAINEE	HOUR	1800
721001	GUARDRAIL END TREATMENT, TYPE 1-31, TEST LEVEL 3	EACH	4



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Item Number	Description	Unit	Quantity
201000	CLEARING AND GRUBBING	LS	1
301002	GRADED AGGREGATE BASE COURSE, TYPE B, PATCHING	CY	56
301001	GRADED AGGREGATE BASE COURSE, TYPE B	CY	270
302002	DELAWARE NO. 3 STONE	TON	576
908004	TOPSOIL, 6" DEPTH	SY	6663
908014	PERMANENT GRASS SEEDING, DRY GROUND	SY	6663
721009	GUARDRAIL TO BARRIER CONNECTION (EXIT TYPE 31)	EACH	2
721010	GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1-31	EACH	6
760006	RUMBLE STRIPS, BITUMINOUS PAVEMENT	LF	15662
760012	PAVEMENT MILLING, BITUMINOUS CONCRETE PAVEMENT, VARIABLE DEPTH	SYIN	70563
817019	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 5"	LF	100
762000	SAW CUTTING, BITUMINOUS CONCRETE	LF	3329
762001	SAW CUTTING, CONCRETE, FULL DEPTH	LF	200
763000	INITIAL EXPENSE/DE-MOBILIZATION	LS	1
763501	CONSTRUCTION ENGINEERING	LS	1
831004	FURNISH AND INSTALL UP TO 4" SCHEDULE 80 PVC CONDUIT (TRENCH)	LF	6694
831009	FURISH AND INSTALL UP TO 4" GALVANIZED STEEL CONDUIT (ON STRUCTURE)	LF	392



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Item Number	Description	Unit	Quantity
850532	TEMPORARY LIGHTING	LS	1
905001	SILT FENCE	LF	100
905004	INLET SEDIMENT CONTROL, DRAINAGE INLET	EACH	11
907017	COMPOST FILTER LOGS	LF	800
908023	STABILIZED CONSTRUCTION ENTRANCE	SY	810
909002	SANDBAG DIVERSION	CF	1100
909004	TURBIDITY CURTAIN, FLOATING	LF	1450
701500	PORTLAND CEMENT CONCRETE CURB, TYPE 1, MODIFIED	LF	46
707012	RIPRAP, R-6	CY	846
760013	PAVEMENT MILLING, PORTLAND CEMENT CONCRETE PAVEMENT	SYIN	278
207020	STRUCTURAL BACKFILL, (BORROW TYPE B)	CY	56
825001	TUBULAR MARKERS	EACH	300
908020	EROSION CONTROL BLANKET MULCH	SY	6663
615501	PREFABRICATED SUPERSTRUCTURE MODULES	LS	1
615510	NAVIGATION LIGHTS FOR FIXED BRIDGES	LS	1
623000	ELASTOMERIC BEARINGS	EACH	120
624000	PREFABRICATED EXPANSION JOINT SYSTEM, 3"	LF	70



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Item Number	Description	Unit	Quantity
625501	POLYESTER POLYMER CONCRETE OVERLAY INSTALLATION	SYIN	2450
625502	FURNISH POLYESTER POLYMER CONCRETE OVERLAY	CY	69
628001	REPAIR OF CONCRETE STRUCTURE BY EPOXY INJECTION	LF	330
628041	DEEP SPALL REPAIR	CF	105
628042	REHABILITATION OF PORTLAND CEMENT CONCRETE MASONRY	CY	4
721006	END ANCHORAGE 31	EACH	2
824002	POST MOUNTED DELINEATORS	EACH	25
202000	EXCAVATION AND EMBANKMENT	CY	1520
209006	BORROW, TYPE F	CY	773
211000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	1
211002	REMOVAL OF STRUCTURES AND OBSTRUCTIONS (GUARDRAIL)	LF	1896
401030	SUPERPAVE TYPE B, PG 64-22, PATCHING	TON	44
401037	SUPERPAVE TYPE B, PG 64-22, WEDGE	TON	681
401045	SUPERPAVE TYPE C, PG 70-22 (NON-CARBONATE STONE)	TON	4116
503001	PATCHING PORTLAND CEMENT CONCRETE PAVEMENT, 6' TO 15', TYPE A	SY	153
602130	ADJUSTING AND REPAIRING EXISTING DRAINAGE INLET	EACH	13
602506	CONVERTING EXISTING JUNCTION BOX TO CATCH BASIN	EACH	2



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604001	PROTECTIVE SHIELD	LS	1
605504	FRP JACKET AND EPOXY GROUT PILE ENCASUREMENT, 18" ROUND PILE	LF	770
605511	FRP JACKET AND EPOXY GROUT PILE ENCASUREMENT, 16" ROUND PILE	LF	600
610005	PORTLAND CEMENT CONCRETE MASONRY, SUBSTRUCTURE, CLASS A	CY	40
610008	PORTLAND CEMENT CONCRETE MASONRY, PARAPET, CLASS A	CY	10
610017	PORTLAND CEMENT CONCRETE MASONRY, SUPERSTRUCTURE, CLASS D	CY	24
610018	PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D	CY	94
610500	ULTRA HIGH PERFORMANCE CONCRETE	CF	972
611001	BAR REINFORCEMENT, EPOXY COATED	LB	48319
612504	PRECAST APPROACH SLAB PANELS AND SLEEPER SLAB UNITS	CY	86
613000	EPOXY CONCRETE SEALER	SF	1696
613001	SILICONE-BASED ACRYLIC CONCRETE SEALER	SF	17367
628070	DRILLING HOLES AND INSTALLING DOWELS	EACH	1420
708003	GEOTEXTILES, RIPRAP	SY	1151
701011	PORTLAND CEMENT CONCRETE CURB, TYPE 1-4	LF	144
720021	GALVANIZED STEEL BEAM GUARDRAIL, TYPE 1-31	LF	1287